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Short Research Paper

## O2O Information Flow Closed-loop Strategy Enabled by Digitalization and Intellectualization

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**Abstract:** O2O closed-loop is an important strategy for O2O companies to gain traffic growth and users retention to achieve sustainable development. Information flow is an important component in the closed loop, and the development of digital intelligence technology is an important driving force for the closed loop. Focusing on the O2O information flow closed-loop strategy enabled by digitalization and intellectualization, this paper first explains the connotation of information flow in O2O commerce. Then, the closed-loop path of O2O information flow is analyzed, which consists of six units, and a theoretical model is proposed. Furthermore, taking Koubei as the case study object, the digital measures of Koubei in implementing the closed-loop strategy are analyzed. Finally, this paper points out that academic research on O2O closed-loop is still relatively limited and deserves further attention from scholars.

Keywords: O2O closed-loop, information flow, digitization, intellectualization

### 1. INTRODUCTION

In recent years, with the rapid development and in-depth application of mobile Internet technologies, e-commerce models such as B2C, C2C and O2O have been emerging and becoming an important part of the digital economy and the real economy. Among them, the concept of O2O (Online to Offline), the idea of which is to find consumers online and bring them into physical stores, was first proposed by Alex Rampell in 2010. By integrating online and offline channels and synergizing online and offline advantages, O2O commerce brings a better shopping experience to consumers and creates greater value for merchants. Within the past ten years, O2O commerce has been popular worldwide. With the help of new technologies such as big data, artificial intelligence, and the Internet of Things, changes occurred in the traditional retail industry in terms of business philosophy, business model and payment scenarios. The shift from traditional manual operation to full-link digital operation has greatly enriched consumption scenarios, improved consumption experience, and effectively promoted the upgrading of consumption quality and social value. The deep integration of online and offline services and experience has gradually become the mainstream consumption mode and has provided consumers closed-loop services based on their diversified and personalized need in various fields such as entertainment, transportation, education, medical care and elderly care.

The underlying logic of O2O commerce is to provide online services such as information search, order payment and post-purchase review for consumers on O2O platform, and guide consumers to physical stores for offline experience, thus forming a closed-loop service and experience process. O2O closed-loop is an advanced form of O2O application in which closed-loop construction is critical to the success. Information flow is an important component in closed-loop construction. Information exchange platforms are provided by O2O platforms that focus on information flow to connect merchants and consumers, which effectively solves the problem of information asymmetry or opacity. With information flow, operation strategies and supply chains can be properly adjusted by merchants in a timely manner by collecting and analyzing consumption data and user behavior<sup>[1]</sup>. Meanwhile, consumers can experience a more convenient and high-quality O2O experience with

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the support of the information flow closed-loop and big data technology. In addition, O2O platforms can achieve traffic growth and user retention in the above process.

Theoretical research on O2O closed-loop and O2O information flow has attracted academic attention. Xia and Chen<sup>[2]</sup> argued that the O2O closed-loop process is that the platform conducts online marketing and promotion, consumers pay online, experience offline, and finally give feedback online. Wang and Zhang<sup>[3]</sup> analyzed the operation mechanism of agricultural products O2O and proposed that an integrated closed-loop system, the supports of information-based system as well as data integration and processing technology, effective synergy strategies between online and offline, are the foundation of agricultural products O2O. Zhang and Hu<sup>[4]</sup> choosed rural tourism O2O as research context, and explored the formation mechanism of O2O closed-loop through empirical analysis. Zhang et al.<sup>[1]</sup> interpreted the O2O closed-loop from the perspective of value chain and proposed that the O2O closed-loop is composed of information flow, commodity flow and capital flow.

From the review of the above literature, it can be found that scholars have explored the connotation, path, and formation mechanism of the O2O closed-loop, but the current theoretical research is still very limited. In particular, there is a lack of in-depth and systematic theoretical explanations on issues such as the path and formation mechanism of the O2O information flow closed-loop. Accordingly, this paper attempts to construct a closed-loop theoretical model of information flow in the context of digitalization and intelligence. The possible contributions of this study are: (1) The closed-loop theoretical model of information flow is proposed, which can fill the gap of theoretical research in this field and further expand the research work related to O2O commerce; (2) The exploration of how digital technology can empower O2O commerce in the context of digital e-commerce can enrich academic research in the field of e-commerce in digital economy research; (3) The theoretical research on the information flow closed-loop can guide the direction of O2O enterprise practice.

## **2. INFORMATION FLOW CLOSED-LOOP**

### **2.1 Information flow in O2O commerce**

Information flow, along with capital flow and logistics, constitute the basic content of O2O operation. The information flow includes platform information and merchant information related to the operation of the O2O platform; interaction information, behavior information and comment information related to consumers; and order, inventory, payment, delivery and other information generated by transactions. Data-driven information flow management will comprehensively improve user experience, realize efficient transactions through online and offline information integration, and promote the success of the O2O model<sup>[5]</sup>.

As an information intermediary, O2O platforms can provide consumers with more choices and help consumers understand the detailed information of merchants and their services and/or products. Individual needs and behavioral preferences of customers are obtained by the platform while customers interact with it and are used to make accurate pushes to customers in combination with their real-time geographic location. Meanwhile, the collected offline supply and demand information is presented through online and offline information collaboration of platforms and merchants to achieve efficient information matching and sharing, and eventually facilitate transactions. In the offline channel, the platform records consumers' behavior data by providing services such as online queuing, scanning code ordering, and online payment. Furtherly, a common system for both the merchants and the platforms to use the obtained data is developed based on real-time data exchange to better service and retain customers. Lastly, customers share their consumption experience on the O2O platform and interact with the platform, merchants or other consumers.

### **2.2 Information flow closed-loop model**

Information flow closed-loop is a closed-loop between online and offline channels formed by the

circulation of information between online platforms and consumers, online platforms and offline merchants, and offline merchants and consumers in the O2O closed-loop process. The closed-loop involves the initiation, transmission, reception and feedback of information, and requires the use of technologies such as big data, cloud computing, and artificial intelligence. This paper summarizes the closed-loop path with six units: online traffic attraction — platform adoption — information collection — traffic conversion — offline consumption — online feedback, as introduced below.

(1) Online traffic attraction. Online traffic attraction is the beginning of information flow closed-loop. It initiates and disseminates information through advertising, promotional activities and word-of-mouth marketing to attract consumers online. Platforms can be promoted by placing advertisements online and offline, such as major websites, publicity boards at bus stops. Also, consumers' attention can be attracted by promotional activities. Those with wide ranges and large discounts can bring huge traffic to the platform. In addition, with the popularity of social networks today, consumers' decision-making largely depends on the comments, recommendations and sharing of other consumers<sup>[6]</sup>. Therefore, many O2O platforms are actively conducting word-of-mouth marketing on various social media to gain the goodwill of consumers and attract consumers to online platforms.

(2) Platform adoption. In e-commerce environments, scholars have widely used Technology Acceptance Model (TAM) in the field of information technology to study users' behaviors<sup>[7]</sup>. In this model, two major determinants are perceived ease of use and perceived usefulness<sup>[8]</sup>. According to the technology acceptance model, perceived usefulness refers to the degree to which consumers perceive that a technology or system can improve their own efficiency when using it and perceived ease of use refers to the degree to which consumers perceive a technology or system to be easy to learn and use. Perceived usefulness and perceived ease of use have significant positive effects on consumers' willingness and behavior to a new system. It is more likely that consumers will be willing to use the platform if the website is easy to operate and provides consumers with useful information. In addition, the ease of use and usefulness of a website can affect how enjoyable consumers are to browse it. If the interface design of the platform website is beautiful and can interact well with consumers, With proper design in aesthetics and interaction wise, it is possible for the platforms to present more enjoyable using experience to consumers that they will ignore the risks of online transactions to a certain extent. After consumers accept the O2O platform, they may fill in personal information to register as a platform user which will be collected to the platform's user database, so that the platform can better provide services and personalized marketing to consumers in the subsequent O2O process.

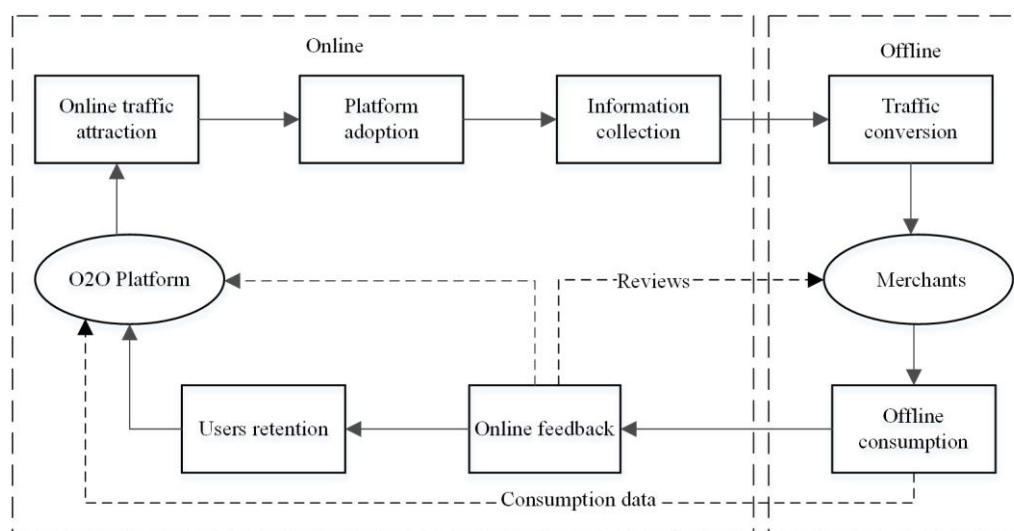
(3) Information collection. There are two sources of information collection: the information provided by the merchants and the feedback from other users. Since the information provided by merchants is generally for marketing purposes, and the amount of information is often limited, consumers will pay more attention to the comments, recommendations and suggestions from other users. However, only useful online feedback can help consumers in their decision-making. On the contrary, useless, repetitive and low-quality information will increase the cost of information collection. Therefore, algorithms to identify the keywords in the feedback information, screen and sort the feedback information according to different relevant characteristics, and filter out the information that is not very helpful to consumers are important, as which help consumers reduce search costs and improve decision-making efficiency. Then, consumers form their own evaluations of different merchants, which leads to appropriate selections of consumer objects from these merchants according to their needs or interests. In this process, the platform collects the users' traits in the platform, categorizes the users' labels such as basic information, preferences and behavioral characteristics and eventually uses technologies such as big data to optimize services to better meet the personalized and diverse needs of users, improve user experience, and keep the information flowing in the closed loop.

(4) Traffic conversion. After information collection, expectations for merchants' products or services are established for consumers, which in turn triggers their offline consumption motivation, and online traffic may be converted into offline traffic. Traffic conversion is a key unit in the closed-loop process and is the fundamental way to connect online and offline. However, it is a relatively uncontrollable part of the closed loop. Whether consumers come to the physical store will depend on individual factors such as the consumer's geographic location and schedule, which are significantly different for different individuals. In order to harvest the highest possible traffic conversion rate and to ensure the progress of the closed loop, it is necessary for O2O platforms to carry out effective traffic operation and marketing. The basic information of user registration and the behavior information generated by interaction with the platform are classified and stored according to different attributes, and the data is deposited in the CRM system, thereby establishing a more accurate and controllable traffic pool. Different strategies can be applied to arouse consumers' interest and make consumers Maintain offline consumption motivation, such as timely pushing merchant-related information to consumers based on their labels or tracking their movements, actively investigating the consumers' reasons of not visiting offline stores, or providing consumers with merchant discounts and other measures.

(5) Offline consumption. In the offline consumption process, merchants can bring real experience to consumers by playing their advantages of physical stores in terms of goods, services and environment. The O2O platform can provide consumers with online services such as queuing, ordering, and payment, improving the convenience of shopping. The order data and consumption data generated by consumers are shared between the platform and merchants to achieve online and offline information symmetry and improve the efficiency of online and offline collaboration. Through the analysis and processing of massive data through big data technology, the platform can grasp the preferences and behavioral characteristics of consumers, and provide consumers with personalized recommendations; merchants can discover problems in the process in time and optimize consumers' in-store experience. In this process, satisfactory user experiences are provided to consumers jointly by platforms and merchants.

(6) Online feedback. With the development of social networks, it is more and more common for people to expressing opinions, obtaining information and sharing experiences on online platforms. Consumers' purchasing decisions are largely influenced by other users in the community in today's digital marketplace, resulting in more profit from their feedback behavior on O2O platforms than repurchase behavior<sup>[9]</sup>. Therefore, a major strategy of O2O commerce is to promote online through social media, thereby increasing the sales of brick-and-mortar stores. Productreview.com in Australia and Dianping.com in China are good examples in this matter, which collect user-generated content in the form of reviews of merchants, from which consumers obtain product information to make offline purchasing decisions<sup>[10]</sup>. Online feedback is of great significance to O2O platforms, offline merchants and other consumers. For O2O platforms, only when consumers provide valuable information feedback can the platform better support consumers and achieve user retention. In addition, the platform can also use the feedback information to carry out word-of-mouth marketing to further attract new traffic. For merchants, positive feedback from consumers can help merchants conduct online marketing and attract traffic, while negative feedback can help merchants improve products or services. For consumers, feedback from other users can provide valuable, real-time information and provide reference for purchasing behavior.

The closed-loop model of O2O information flow is shown in Figure 1. O2O platforms attract consumers through publicity and marketing. Then, consumers collect merchants' information on the online platform, make a judgment on whether the merchants meet their needs or interests, and choose a suitable merchant. After offline consumption, consumers feed back relevant experiences online, and this information is then fed back to offline merchants and displayed to other consumers.



**Figure 1. Information flow closed-loop model**

### 3. CASE ANALYSIS

This paper will take Koubei as the research object, collects the relevant information of Koubei from Pintu.com, and explore how Koubei created an information flow closed-loop through digital measures. Koubei.com was established in 2004 and was invested by Alibaba in 2006. It is a company that provides users with information and comments on local life services, such as information query, online transaction, evaluation release, preferential recommendation. Its business covers offline scenes such as restaurants, supermarkets, beauty, fitness, movie performances. In 2018, Alibaba announced the merger of Ele.me and Koubei to form a local life service company. Ele.me and Koubei focus on the two main scenarios of take-out and in-store respectively. Combining Ele.me's local life service resources, instant delivery capabilities and Koubei's merchant service system, the digital and Internet-based upgrades of the local life service market (mostly catering) is promoted.

Regarding online traffic attraction, Koubei has its own independent app portal which is proper designed to attract traffic. Koubei has built digital "word-of-mouth streets" in various places, which presents the information of all merchants in a physical street on the corresponding digital list. When consumers click on any merchant on the Koubei app, they can not only see the merchant's information and address, but also receive exclusive discounts. The interaction between consumers and merchants will form word-of-mouth lists and data reports. Through big data and Internet technology, it helps merchants to better understand consumers, formulate more scientific and accurate service plans, and provide consumers with 'private customized discounts'. In addition, Koubei also obtains traffic support by accessing entries from other platforms under Alibaba Group. Koubei belongs to Alibaba, which has a huge business system covering sales, services, entertainment and other fields (see Figure 2). Not only dominant applications like Taobao and Alipay, but also platforms that lead in their categories such as AutoNavi Maps, Youku, and Fliggy.

Secondly, the technology and system infrastructure, marketing service and data management platform, and payment and financial service infrastructure (see Figure 2) of Alibaba provide strong support for Koubei such as cloud computing, digital marketing, and mobile payment. Koubei has the ability to show consumers a strong platform construction to improve consumers' perceived ease of use and perceived usefulness when consumers using the platform.

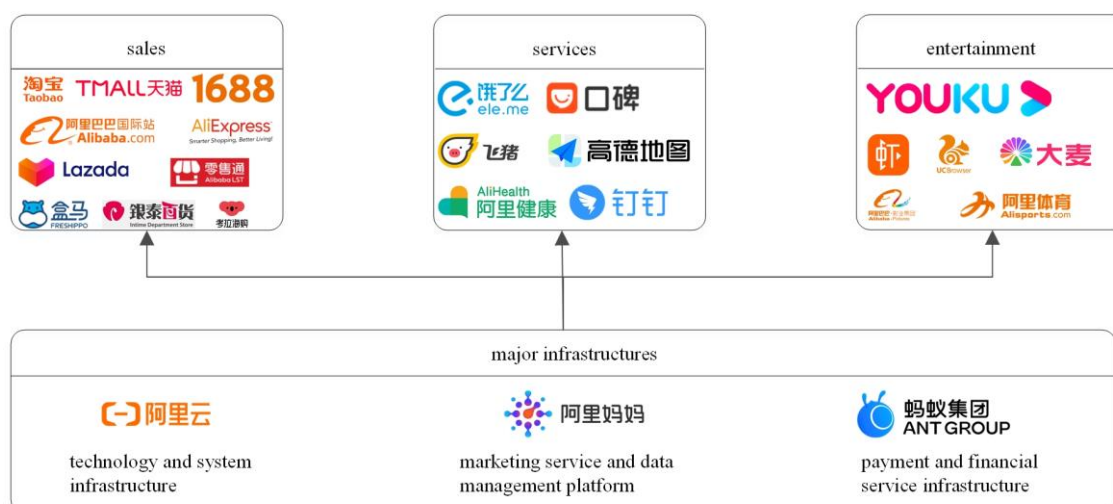


Figure 2. Alibaba Ecological Map

In terms of traffic operation, with Alibaba's leading domestic user numbers and strong data advantages, Koubei can analyze and process massive consumer data, accumulate rich user labels, and furtherly provide consumers with accurate and efficient services recommendations to stimulate more consumption. In addition, Koubei's online store provides consumers with full-process services including reservation, ordering, receiving discounts, and online payment. In 2017, Koubei launched the "Koubei Code" strategy, which allows traffic to flow freely online and offline by building a new channel of "QR code-shop-payment". Through the above measures, Koubei can effectively carry out traffic operation and marketing, greatly improve the efficiency of conversions, and guide online traffic to offline physical stores.

Finally, in order to allow consumers to experience higher product quality and service quality in the offline experience process, Koubei has been committed to empowering merchants and helping them upgrade their digital operations. In 2017, Koubei announced the opening of its smart restaurant technology which provides catering merchants with full-process solutions including smart ordering, smart recommendation, service notification, self-service meal pickup, and automatic withholding. In 2019, Koubei launched the "new service" strategy, focusing on providing merchants with the ability to "digitize and intelligentize the middle platform" to achieve a jump in the level of digitalization. On March 16, 2020, Koubei held the "2020 Merchant Conference" online. On the basis of a number of previous merchants' anti-epidemic support measures, a number of new merchant empowerment plans were announced. For example, in the next year, Koubei will upgrade the "digital intelligence platform" for 1 million merchants to help them achieve the digital upgrade of the entire chain of operations; establish Ali Local Life University, set up eight colleges including catering, logistics, and retail, and 1,000 high-quality courses export within 3 years; help 10 million employees to upgrade and develop their digital capabilities.

#### 4. CONCLUSIONS

O2O closed loop involves information flow, commodity flow and capital flow. This paper focuses on the closed loop of information flow. The connotation of the closed loop of information flow is expounded and the path of the closed loop of information flow is explored. The main units along the online-offline-online loop path, such as online traffic attraction, offline consumption and online feedback, are analyzed. Lastly, Koubei is used as the research object to explore the specific measures in the closed loop of information flow. This study found that by combining digitization and intelligence, Koubei helps merchants reduce costs and increase efficiency,

improve service levels, and further enhance user stickiness.

The development of O2O commerce in China has entered a stage of the fully integration of online and offline channels with more and more fields penetrated. However, the competition in the O2O e-commerce market is becoming more and more fierce at the same time. The ability to provide consumers with a satisfactory customer experience largely determines whether an enterprise has a competitive advantage or not. In this context, O2O closed-loop has become one of the important solutions for O2O companies to cope with competition and achieve sustainable development. The O2O closed-loop combines offline physical merchants, consumer geographic locations and new Internet technologies, and brings consumers a closed-loop service experience that seamlessly connects online and offline based on the local service market, and eventually achieves the purpose of user retention and profit growth for the platform. Traditional entity enterprises and Internet companies have deployed the O2O field through cooperation, investment, self-owned and other methods. They have also used big data, artificial intelligence, Internet of Things and other technical means to create an O2O closed loop in practice. However, academic research on O2O closed-loop is still relatively limited and deserves further attention from scholars.

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