An O2O commerce service framework and its effectiveness analysis with application to proximity commerce

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Abstract

With the exponential growth of smart handheld devices and social communities, mobile commerce, social commerce and proximity commerce are also created in the last decades. Recently, the newer commerce model is online to offline (O2O) commerce and various kinds of creative service models have been proposed. It becomes a major research topic since retailer and enterprise may not be ready to utilize the new service model and consumer may not be used to this type of service. This paper applies customer journey analysis of some popular O2O service scenarios, defines an O2O Commerce Service Model, and proposes an O2O Commerce System Framework. According to this framework, this paper implements a “One-Click Shopping Wall” service to conduct an experiment of the best practice of Proximity Commerce Service. In this case, some offline digital signage is formed to attract nearby users to interact and make some online transaction with their mobile device, and then guiding them to finish the act of consumption in bricks-and-mortar. According to this case study, we conduct the effectiveness analysis experiment to find the key factors of consumer behavior. The research also applied one day promotion where users have to purchase and share product on their Facebook Wall with One-Click shopping mall app. The experimental results includes 352 people counts, 27.5% App downloads, 6% product conversion, 31% coupon collection, and 30% social network sharing. This research proposes that: 1) the distance between kiosk and store and 2) discount availability are highly correlated to the act of transaction. Thus, it provides a good reference for service providers to conduct attractive promotion to maximize O2O effectiveness. The research result can avoid the costly mistake of designing various mechanism and provide user adoption analysis and digital marketing strategy via online/offline in adopting this kind of innovation service.

Keywords: Online 2 Offline; Proximity commerce; Effectiveness analysis

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1. Introduction

With the exponential growth of mobile device and social community in the last decades, social media and mobile device not only change the way people communicate with friends, but also change the way providers communicate with consumers. We keep posting and reading all the time and all over the place, no matter we are online surfing/blogging using computers or offline walking/shopping using mobile devices. The ubiquity of people getting connected dramatically changes the landscape of post Electronic Commerce. Thus mobile commerce, social commerce and proximity commerce are also created in recently years. People can search prices of goods from web sites through their mobile devices, request expertise comments from social community and find nearest bricks-and-mortar through location based service.

Besides, the hot commerce model is “online to offline” and “offline to online” (O2O) commerce and many kinds of creative service models are proposed. No matter online or offline, how to provide convenient service through different channels becomes the major research issue for retailer and enterprise. Bricks-and-mortar retailer wants to provide advertisement information for those people nearby to attract them to walk-in and shop. On the other hand, online retailer also wants to attract people placing orders from their mobile device whenever they are at physical stores. Bricks-and-mortar and online retailer may not be ready to apply new O2O service model, whereas consumer may not be used to facilitate this kind of new service. There are various famous O2O commerce services including LBS promotion (ex: LifeLog, Retailigence), In-store interaction (ex: ShopKick), price relation (ex: ShopSavvy) and offline surveying to online shopping (ex: Taobao). Thus O2O Commerce can be defined as providing seamless shopping experience between online commerce and offline bricks-and-mortar with any connected device.

Due to the variation and multiplicity issues of the integrated O2O commerce, retailers have lots of issues. For example, they have to know how to reshape their ordinary service content, service flow and interfaces, how to adjust their legacy service framework and system capacity? How can they provide new multi-channel service to integrate with their traditional brick-and-mortar or E-commerce? How to evaluate their O2O service is cost-effective and check the consumer satisfied with the proposed new services? And how to check the return of invest can reach the goal of quick set-off, referrals, and revenue?

According to these issues, this paper focus on the analysis of new services, proposes an O2O Service model and integrated O2O commerce framework, so that retailers can follow this architecture to implement their new O2O service, and evaluate with their O2O service from the proposed effectiveness analysis.

2. Literature review

2.1. The paradigm shift of commerce

Commerce models are always changed with the evolution of technology. In tradition, the bricks-and-mortar is the most common service model. With the dot-com dedicates, enterprise created different kinds of web sites to service online user through Internet. Gulati and Garion[1] proposed companies are recognizing that success in the new economy will go to those who can execute clicks-and-mortar strategy that bridge the physical and the virtual worlds. With the dot-com decades, companies should mix the bricks-and-mortar and clicks-and-mortar and tailor their strategy to their own particular market and competitive situation, dramatically increasing their odds of e-business success.

With the growth of commerce, the linkage between online and physical commerce are becoming stronger. Rampell[2], explored the forces behind what he called “Online2Offline (O2O)” commerce, which means finding consumers online and bringing them into physical stores. Consumers can purchase products online, and at the same time receive the products or service at the real-world store. For example, Groupon and OpenTable are the best practice of this kind of service. In the other way, O2O commerce can also defined as “Offline2Online” commerce, which means consumers can visit physical store and also get virtual service online. For example, ShopSavvy allows consumers to scan items’ barcode or input a product name to find out similar products in nearby traditional retailing stores and internet stores with price comparison.

O2O Commerce services can be any composition of bricks-and-mortar, e-commerce, social commerce, location-based service and mobile commerce. Enterprises can design different marketing strategies according to different
consuming situations such as: attracting nearby users before they enter the bricks-and-mortar, providing real-time promotion when users are in the store and retaining sales after users finish shopping and leave store. But, no matter offline to online or online to offline, the core value of O2O commerce is to provide an integrated consuming experience.

2.2. The changed channel of commerce environment

In the past, enterprise can only apply single shopping channel to contact consumers such as: bricks-and-mortar, television, radio, directly mail, catalog and etc. In the early days of the web, the e-commerce store was also a single, standalone channel. Customers can only experience a single type of touch-point. Multichannel retailing means a variety of channels can be applied in a consumer shopping experience. Cross channel is defined as the transmission of content through various media in marketing and interaction design. Omni-Channel Retailing is the evolution of multi-channel retailing and cross-channel retailing, which emphasized on providing real-time, seamless, consistent and personalized consumer experience through all available shopping channels such as social, mobile, store, online2offline, offline2online and so on. An integrated sales experience that melds the advantages of physical stores with the information-rich experience of online shopping[3].

Since retailers have varieties of channels to reach users. Consumers want to experience a consistent and thought brand, instead of an individual brand for each channel. Many innovations services are proposed, however, many researches issues arise while applying the Omni-channel retailing and O2O integrated commerce services such as:

- Omni-channel retailing service integration: Consumer may shop in any kinds of channels, but it takes a lot of time and technologies to make products going on the offline /online shelf. The retailer has to plan a well-defined digital marketing strategy and KPI measurement.
- Consumer Intention Management: Consumer may survey the price on the web but buy in bricks-and-mortar. On the other hand, consumer can also survey in-store but place an order online. Consumers are provided with diverse channels of how they conduct their consuming behaviors. Therefore, the key issue is to study the various factors which influence user acceptance on how decisions are made in terms of their shopping channels.

3. O2O Commerce Service Model and Framework

3.1. O2O Service Model

With the dot-com decades, companies are trying to mix the bricks-and-mortar and online commerce to tailor their strategies with their own particular market. There are lots of papers providing related researches. With the changing commerce environment, it is very hard for company can know how to apply Mobile Commerce, Social Commerce and Proximity Commerce with their traditional commerce via Online / Offline.

With the changing commerce environment, there are lots of online to offline and offline to online interactions different from traditional bricks-and-mortar and E-commerce. This paper adjusts the service model in the previous research [4] and focuses on mobile commerce, proximity commerce and social commerce then proposes the O2O commerce service model in Fig.1.
The top area represents the real-world marketing service model (Offline). Manufactures produce and send their products to channels or brick-and-mortar. According the location-based service and proximity commerce marketing strategies, retailers can attract users to use their mobile devices to interact with out-of-home (OOH) digital signage or kiosk to get online coupons then shopping in the nearby physical store. Besides, some retailers propose their mobile apps to provide mobile services to provide after services to retain their target audience loyalty.

The bottom area represents the online marketing service model. Users tend to survey others’ opinions online before making decisions. Users are very willing to participate with the brands on Social Network, such as Facebook fans group. They will click likes, shares and post comments in any social events. So retailer can monitor online world of mouth (WOM) to adjust their marketing strategies and sustain relationship with their customers directly and instantly. Moreover, retailers can apply social events to influence and engage consumers’ social network friends to participate and provide referral awards or group purchase discounts.

3.2. O2O Service System Framework

According to the lifecycle and related commerce solution architecture, this thesis proposes an O2O Service System Framework shown in Fig.2. This framework is separated with interface, interaction, intelligence and integration layers. The first Interface layer represents different kinds of channels which include bricks-and-mortar (offline), proximity commerce, mobile commerce, social commerce and E-commerce (online) to provide different user interfaces. The second Interaction layer represents the interaction services where user or retailer can access from interface layer according to the commerce lifecycle proposed by IBM[5] and different channels from interface layer. The third Intelligence layer represents integrated analytics applied to single, multiple or Omni-channels. And the bottom Integrated layer represents the Cloud / Enterprise Infrastructure Services, which can be applied to cooperated with the general SOA of scalable systems.

3.3. The design of one-Click Shopping Wall

This paper implemented "one-Click Shopping Wall" to collect empirical data. The digital signage can be located in Taipei metro stations, railway stations and department stores to attract those people stop and purchase interactively when they walked through. Consumer can use their mobile device scanning the QR Code to get discount or finish the transaction with the digital signage then getting the goods/service at proximately brick-and-mortar, department store or their home. With more digital signage located in different offline locations, consumer can finish their transactions online and get the goods/services offline. This can be a physical to virtual channel. So that we define it is a kind of O2O proximity commerce service.
For each digital signage, there is a web cam to analyze how many people walk through it and how many people will gaze it then the back-end server can know if their content is attractive. When consumers are interested in some product advertisement, they can use their mobile devices to scan the product QR Code. Customers could add the discount to their favorites or make the purchase. Once the transactions are completed, consumers frequently share their consuming experiences on their social networks. Since the discounts, goods or services are closely located to the digital signage, consumers can decide if they prefer to get the goods or services immediately. Otherwise, they can decide on having home-delivery service or keep this bill until next time. After this service interaction, consumers can also share events or their experiences through social networks for peers to know about the consuming experiences. The customer journey is designed in fig. 3.
Fig. 4 represents the service blueprint of one-Click Shopping Wall. The physical evidence shows different stages design of consumer behavior[6]. Corresponding to each stage, the consumer action, front-of-stage interaction, back-of-stage interaction and support process are designed.

Since consumers may come from online or offline channels. It should have a manageable and integrated digital marketing strategy. This paper applies the Smart Insights RACE ((Plan) > Reach > Act > Convert > Engage) digital marketing strategy [7] to help retailer to manage and improve digital marketing results shown in fig.5.

In the first REACH stage, this thesis applies the face detection analysis from the digital signage to apply people counting analysis to check how many people will gaze the digital signage when they walk through the digital signage. Besides, the digital signage can collect other consumer attributes such as average ages, genders, popular products, prime location, and frequency.

The second ACT stage, back-end server can gather the user interaction information such as number of App downloads, counts of scanned QR codes, and Cost-per-click to analysis which type of product will attract user to take interactions. Then we can calculate a first Click through Rate (CTR) from QR Code scans to mod people counting.

![Fig. 5. one-Click Shopping Wall Service and RACE analysis. (a) Digital Signage; (b) Mobile app; (c) RACE Analysis.](image_url)
In third CONVERT stage, back-end server can collect the transactional information such as orders, conversion rate, Cost-per-Action, number of new customers and etc. The second Click through Rate can be calculated from transaction to mod QR Code scans. The conversion rate can be transaction mod App downloading numbers.

At the last ENGAGE stage, the back-end server can analyze repeat conversion rate, average frequency, and social engagements. The third Click through Rate can be repeat transaction numbers mod transactions.

### 4. Retailer performance evaluation

This research also applied one day promotion where users have to purchase and share product to their Facebook Wall with one-Click shopping mall app. Each user has to walk nearly to this digital signage and scan any product QR code to download this one-Click shopping wall App with his smart phone. And then he has to follow the event criteria to finish one transaction or post one product on Facebook then getting subsidy return. There are total 80 people invited to join this event in this office. The collecting data includes:

- This digital signage has two kinds of layout which includes group-buying products and limited coupons and plays respectively per 5 minutes. The first layout shows 7 kinds of group-buying products and the second layout 12 limited coupons shelved in the digital signage. Each product and coupon is played respectively every 30 seconds.
- The digital signage reach 352 people counting, 52 males counting, 286 female counting and average age is 24.8 years old.
- The actions includes 97 App downloads, 46 product scans and 46 coupons scans in the backend server.
- There are 6 product transactions and 30 coupon collections.
- In social network (Facebook Wall), we collected 55 posts, 30 distinct people, 6 comments, 100 likes and 156 forwarding App clicks.

The experimental result summarizes 352 people counting, 27.5% App downloads of first click through rate from Reach, 47% product/coupon scans, 13% transactions of second click through rate from Action, 6% production conversion rate, 31% coupon collection, 284% App Clicks rate, and 31% social share rate of third click through rate.

### 5. Conclusion

The trend of integrating virtual world and physical world at commerce domain, no matter caused by technology driven or behavior shifting, seems to become irreversible. Consumers are more and more used to switching their mind and action among all possible and available channels, only if it’s convenient and desirable. Thus, from the retailer point of view, it’s essential to redefine the service model and to explore the business boundary.

This work proposed an O2O Service Model and O2O system framework and related research issues in terms of focusing on consumer / retailer effectiveness analysis from the case study of one-Click Shopping Wall. According to the case study, we conducted the effectiveness analysis experiment and attempted to study the key factors of
This research proposes that 1) the distance between kiosk and store and 2) discount availability are highly correlated to the transaction.

This research provided a reference model for retailers to design and evaluate their O2O service and future strategy implementation to avoid the costly mistake of designing various mechanism via online/offline. O2O Service Model is proposed to meet up mushroomed-innovative application patterns; hopefully, this research will lead to a more sophisticated and evolitional solution to set up a starting point of industry implementation and evaluation standard for the coming new era of O2O commerce.

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