Research on Omni-Channel Transformation of Retail Enterprises Under Digital Background

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Abstract. With the increasing popularity of digital technology, the rapid rise of new retail channels represented by mobile e-commerce and social media retail, the retail industry is experiencing a great change in the world. In this context, how to realize the transformation of "omni-channel retail" is becoming an urgent problem for the retail industry and theoretical researchers to solve. Using the method of systematic literature review and Web of science as the sample database, this paper conducts a systematic research on the academic literature of omni-channel retail, and uses the meta-analysis method to summarize the omni-channel transformation solution from the perspective of retail management. Firstly, the concept and characteristics of omni-channel retail are analyzed and summarized. On this basis, the three-dimensional framework structure of omni-channel retail and the basis of omni-channel transformation are revealed. It defines the omni-channel transformation solution which consists of three tasks: integrating retail business, integrating channel information and improving channel visibility. This paper provides a useful reference for researchers to understand and utilize the existing research results of omni-channel retail as a whole, and provides theoretical support and scheme suggestions for the practice of omni-channel transformation of retail enterprises.

Keywords. Omni-channel retailing, transformation, digital technology

1. Introduction

With the increasing popularity of digital technology, following the emergence of online e-commerce, mobile e-commerce, social media retail and other emerging retail channels, the retail industry is experiencing a great change worldwide. The rapid rise of new retail channels has profoundly changed the behavior of shoppers and the development mode of the retail industry. In this context, the concept of "omni-channel retailing" has aroused widespread concern in the retail industry and academia. Verhoef,

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Rigby, Beck [1][2][3]and many other researchers [4][5]put forward that retail enterprises must transform to "omni-channel retailing" if they want to keep their advantages in the future fierce competition. Following the concept of omni-channel retailing, how to realize omni-channel transformation is becoming the focus of the retail industry and related theoretical researchers in the digital era.

This paper adopts the systematic literature review method, through systematic analysis and research of sample literature, the concept, characteristics and structural framework of omni-channel retailing are clarified. Combined with the differences between multi-channel retail enterprises and omni-channel system, it is proposed that the transformation of multi-channel retail enterprises to omni-channel system needs to be solved: The key tasks are the integration of retail business between different channels, integration of channel information and promotion of channel visibility to eliminate channel barriers.

2.   Research Methods

Systematic literature review (SLR) is used in this paper, not only because of the need to explore the research topic of "omni-channel retailing", but also because of the knowledge creation advantage of systematic literature review. "Systematic literature review" is applicable to the integration of research results from different fields under the same topic. It can effectively identify and condense different conclusions on the same issue in different research results, and expand the existing research conclusions on this basis.

In order to reduce research bias and ensure research repeatability, this paper follows the general methods and procedures of systematic literature review.

2.1 Define the research question

In order to achieve the research objective: to find out the theoretical framework and solutions for retail enterprises to achieve omni-channel transformation, this paper sets the following four step-by-step research questions as guidelines for sample literature selection and meta-analysis.
Q1: How is omni-channel retailing defined?
Q2: What are the characteristics of omni-channel retailing?
Q3: What is the structural relationship of an omni-channel retailing system?
Q4: What are the key tasks for multi-channel retailing enterprises to accomplish in the transition to an omni-channel system?

2.2 Literature Search Strategy

In order to search the existing academic research literature under the theme of "omni-channel retail" as comprehensively as possible, and ensure that the selected literature has a higher research quality and level, this paper selects the influential multi-disciplinary academic literature abstracts index database " WEB OF SCIENCE " as the literature source database. In the literature search, we selected two keywords, "omni-channel" and "retailing" for a combined query. The search strategy was a subject search, and a joint search was conducted by selecting the subject:

"omni-channel retailing" OR the subject: "omni-channel retailing". The search restriction conditions are set as follows: 1. The end date of the search is set as June 1, 2020. In order to search the literature as comprehensively as possible, the start date of the search is not set. 2. This paper uses the Web of Science TM core collection, which excludes databases in non-English languages. 3. Setting the search as "subject" search is to make the literature retrieved more comprehensive. Search by subject. Literature with article titles, abstracts, or subject matter related to omni-channel and retail will be retrieved. The search yielded a total of 204 published peer-reviewed journal and conference papers.

2.3 Literature inclusion and exclusion criteria

In order to ensure the quality level and representativeness of the selected samples, the following literature inclusion criteria and exclusion criteria are set in this paper.

2.3.1 Inclusion criteria:

1) The papers included in the research collection must be from peer-reviewed academic journals or academic conferences published in English that have been included in the WEB OF SCIENCE core database.
2) In terms of the influence of articles, the selection criteria are mainly based on the number of citations of articles, and the annual average citation rate index is used as a reference. Literatures with longer publication years but lower annual citation rate are not adopted.
3) In terms of content, the paper should be judged according to the correlation between the thesis topic and the research question set in this paper. The paper with low correlation to the research question should not be adopted, and the sample paper should be related to at least one set question.
4) For the papers with repeated contents, only 1 paper should be retained, and the rest should be excluded.

2.3.2 Exclusion criteria:

1) Papers published outside the search time range, or non-English papers are excluded
2) Exclude papers where full text is not available
3) Exclude papers that do not answer research questions
4) Excluded papers that do not meet the inclusion criteria.

2.4 Descriptive Analysis

According to the above search strategy, a total of 204 studies meeting the selection criteria were retrieved from the core database of Web of Science. According to the classified information provided by Web of Science, 204 studies are found from 17 research fields, such as business economics, operations research, computer science, engineering technology and material science. See Figure 1 for specific data.
Additionally, the studies are refined base on their research directions. After excluding the studies in engineering technology and material science which are not strongly

related to the research of this paper, 164 studies are obtained and constitute the initial sample document collection of this paper.

By analyzing the publication time of the sample literature, it can be found that among the 164 studies, the earliest article appeared in 2011, followed by 1 in 2012, 1 in 2013 and 2 in 2014. The number of articles increased rapidly after 2014. Among them, 6 papers were retrieved in 2015, which doubled to 12 in 2016, 22 in 2017, 38 in 2018, and 51 in 2019. By June 2020, the number of retrieved papers had reached 30.
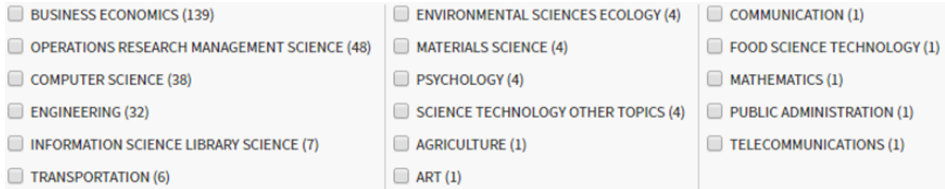

Figure 1 Research direction of "omni-channel retailing" related literature in the core collection of Web of Science

The source journals of the sample articles are also analyzed, 164 articles come from 62 academic journals, such as the International Journal of Retail Distribution Management, International Journal of Physical Distribution and Logistics Management, Journal of Retailing and Consumer Services, Management Science. The names of the top 10 journals with the largest number of sample articles and the largest number of published papers are shown in Figure 2. By June 2020, a total of 9 journals have retrieved more than 4 relevant articles, among which the top 3 journals have retrieved 56 papers, accounting for more than 34% of the total articles. From the perspective of research fields of journals, they belong to logistics management, retail management, marketing, operation management and decision science and other research fields.
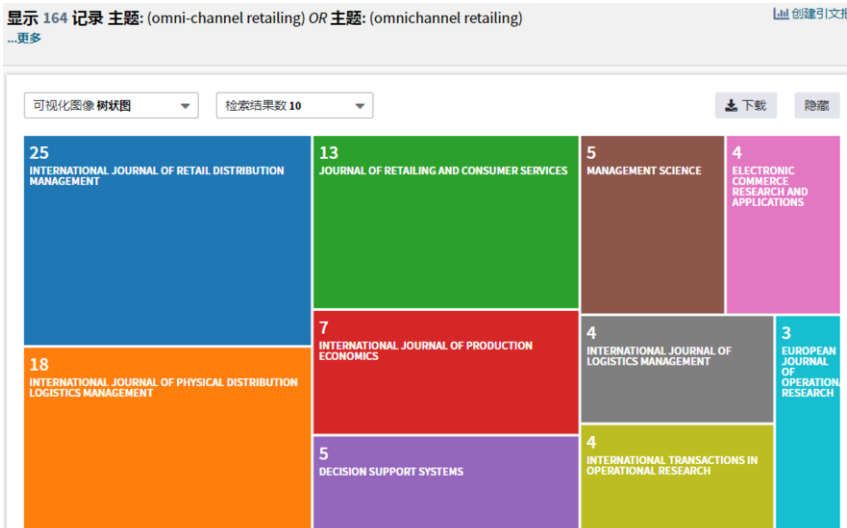

Figure 2 The top 10 source journals of relevant papers and the number of publications

3.   Research Results

Combined with the meta-analysis of the sample articles, the following four research conclusions are obtained.

3.1 Omni-channel retailing concept

There are many different views on the definition of omni-channel retailing, which can be roughly divided into two categories. One is the definition of omni-channel retailing from the perspective of retail enterprise operation management by researchers represented by Neslin, Beck, etc[6][7]. The other is the concept of omni-channel retailing from the perspective of customer experience[5]. Comparatively speaking, the definition from the perspective of retail management has more guiding significance for retail enterprises to realize omni-channel transformation.

Beck et al[2]. believe that multi-channel retailing refers to a silo strategy operated independently by different retailing channels. Cross-channel retailing means that retailers integrate multiple different retail channels to a certain extent, so that consumers can convert and move to a certain extent through the contact points of different channels. On this basis, they proposed that omni-channel retailing is to make the integration between channels develop to the ultimate degree and form a fully interconnected retailing ecosystem. Beck defines retail channels in the context of new technologies as customer touch points and interactive media, connects retail management with customer experience, and further proposes that consumers can freely cross various channels in an interconnected omni-channel retailing system and obtain the best shopping experience. On the other hand, retailers build an interconnected omni-channel retail ecosystem through the collaboration and integration of different channels can lock customers into this system by providing customers with the best shopping experience and certain entry and exit barriers.

Herhausen[5] hold the idea that omni-channel retailing is a retail form and retail strategy. They believe that omni-channel retailing means that retailers allow customers to choose and buy goods through different channels at any time and any place through extensive interaction with customers, and provide customers with seamless, complete and unique shopping experience by effectively eliminating various differences between different channels and overcoming obstacles. They propose that in an omni-channel retailing environment, customers should receive uniform, consistent and integrated service and experience regardless of the channel they use. Customers can seamlessly switch between traditional stores, online channels, and mobile channels depending on their preferences, context, or product category. Therefore, omni-channel retailing can also be called seamless retail. [8][9]

3.2 Characteristics of omni-channel retailing

Accurately identifying the basic characteristics of omni-channel retailing is the basis and guarantee for retail enterprises to realize omni-channel transformation. Huebner and other researchers [10][11][12]compared and analyzed the differences between omni-channel retail and multi-channel and other retail models, revealed the basic characteristics of omni-channel retail from different aspects.

3.2.1 More extensive and diverse channel types

Under the omni-channel retailing model, retail channels are no longer limited to traditional physical stores, online websites, mobile channels (smartphones, tablets, apps), etc., but involve various social media and mass communication channels. Traditional information transmission channels such as television channels and radio stations have also been transformed into new retail channels with the help of digital technology. The concept of retail channel based on customer touch points greatly expands the scope of it, forms a digital era and brings more diversified retail channel forms and a wider range of retail channels. Consumers can generate and complete purchase behaviors through communication on social media or interaction between customers. It can be said that in the omni-channel retailing environment, retail transactions are everywhere. Diversification and ubiquity constitute the important characteristics of omni-channel retailing.

3.2.2 Higher channel visibility and disappearance of channel boundaries

Huebner, Alexander; Wollenburg, Johannes et al[10][13]. proposed that omni-channel retail systems have an integrated perspective with seamless interaction between online and physical channels. Musa [14]proposed that higher channel visibility is not only an important feature of omni-channel retail systems, but also a driving force for the transformation of multi-channel systems into omni-channel. They believe that the so-called channel visibility refers to the ability of channel members to provide, share or retrieve required real-time information.[15] Under the omni-channel framework, the full integration of different retail channels makes the boundary between different channels tend to disappear, and at the same time lays the foundation for channel members to share channel information. Since retail channel information involves products, consumers, inventory, delivery, returns and other aspects, the visibility of channel information is also composed of the visibility of the above aspects.[16][17]

In the omni-channel framework, the co-existing feature with channel visibility is the disappearance of channel boundaries. Customers can use all kinds of channels seamlessly in the search and purchase process. "Shop-shopping" or the opposite "search online and buy in store" can occur in different marketing contexts. In fact, the existence of clear boundaries between different channels has become an important feature that distinguishes omni-channel retailing from other channel models.

3.2.3 Transformation of shopping experience connotation and maximization of purchase value

In a single-channel or multi-channel environment, consumers' shopping experience is mainly concentrated inside a specific online or offline channel. For example, in a physical store, the factors that affect the customer's shopping experience may be the display and layout of goods in the store. However, in the omni-channel environment, customers' switching between various channels and devices (such as physical stores, laptops and mobile devices) becomes an important part of shoppers' omni-channel experience. Omni-channel retail enterprises need to take account of customers' needs of switching between different channels, strive to improve the consistency, connectivity and visibility of commodity and service information between different channels, and maximize the availability and visibility of information between different channels.

3.3 3D structure of omni-channel retail system

A complete omni-channel retail system can be constructed according to three dimensions: different stages of the customer purchase process, channel types providing different service contents and channel agents representing different organizational types (see Figure 3 for details).

According to the four stages of the customer purchasing process: pre-purchase information collection, in-purchase payment, post-purchase delivery and return, the channel stage dimension of omni-channel system can be divided into four stages. Each channel stage includes different channel types and channel agents. The channel type dimension is composed of various methods or media that provide products/services and information to customers at various stages, including physical stores, websites, social media, email, advertising, catalogs (for pre-orders), home delivery, pickup points (for delivery), mail, store pickup points (return), etc. Channel agency dimension refers to the organization that manages and operates various channel types at each channel stage, such as manufacturers, online retailers, physical retailers, logistics suppliers, price comparison websites, credit institutions, etc.[12][18][19]
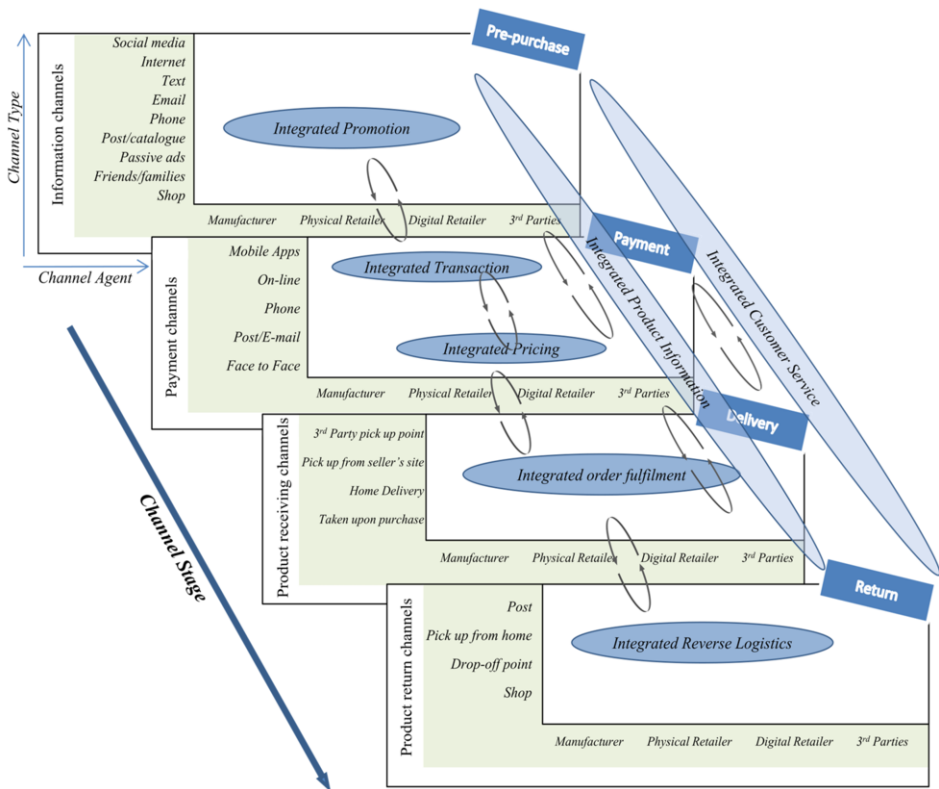

Figure 3. 3D structural framework of omni-channel retail system

3.4 The key task to realize the omni-channel retailing transformation

It is the basic goal of retail enterprises to transform independent single-channel or multi-channel retail businesses into omni-channel retailing businesses. For this purpose,

retail enterprises need to integrate retail businesses, integrate channel information and eliminate channel barriers to improve channel visibility.

3.4.1 Integrate retail business

According to the purchasing process of customers, the corresponding retail business can be divided into five stages: commodity promotion, pricing, transaction payment, order delivery and reverse logistics. On this basis, the retail business integration in the channel stages can be decomposed into five aspects: promotion integration, pricing integration, transaction payment integration, order delivery integration and reverse logistics integration. Specifically include:

Promotion integration. Promotion integration refers to the synchronization and connection of market data with the sources and interfaces of promotion activities. Ideally, the data sources of all promotional information are shared among different channel types and channel agencies. The product/brand name, logo and advertising slogan are consistent. The product promotion on one particular channel should be able to be used in other channel types. At the same time, each specific channel can also cross-promote promotional messages from other channels, thus creating a consistent retailer brand identity across channel types.

Transaction and payment integration. Transaction and payment integration involves interconnecting payment instruments such as cash, checks, coupons, gift cards, postal money orders, and electronic transfers with authorization mechanisms such as pins, verification codes, and signatures. Transaction consolidation also means secure access to consumer transaction data through various channels. Pricing consolidation synchronizes product prices and makes changes (such as discounts) visible to customers and other members of an omni-channel system. Price integration can effectively manage cross-channel pricing strategies and avoid excessive competition. Order delivery integration addresses the connectivity, tractability, and changeability of products, consumers, stock points, delivery points, and transportation patterns across all channels. A high level of order execution integration can provide customers with a better delivery service while reducing delivery costs.

Integration of reverse logistics. The integration of reverse logistics refers to the connection and collaboration between different stages and different channels of reverse logistics. Information about return points, stock points, and product backflows should be traceable and changeable.

3.4.2 Integrating Channel Information

According to the omni-channel three-dimensional structure, omni-channel information integration can be decomposed into three aspects: channel stage information integration, channel type information integration and channel agent information integration.

Channel stage information integration. Information integration in channel stage includes the integration of relevant information in four stages: pre-purchase, transaction payment, commodity delivery and return. Information integration through different stages can allow consumers to move forward or backward in various stages of the channel without losing control of their orders and avoid various problems such as mismatch of goods and services. At the same time, it can ensure that the product or service provider can fully understand the situation of customers in each stage of the purchase process, so as to provide customers with more efficient services.

Channel type information integration. Channel type information integration refers to the consistency and collaboration of information among organizations of different channel types (such as online e-commerce, offline stores, and mobile channels). The effective integration of information between channel types lays the foundation for customers to switch easily from one channel type to another.

Channel agent information integration. The information integration between different channel agents can ensure that different channel agents send the same information to consumers, provide the same standard of products and services, and then create conditions for customers to obtain a seamless omni-channel shopping experience.

Through effective information integration, customers can move between any touch point in the omni-channel system (Figure 3) without barriers, laying the foundation for seamless shopping experience.

3.4.3 Improve channel visibility

Retail channel visibility refers to the ability of relevant departments or organization members of different channel types to provide, share or retrieve required real-time channel information. In an omni-channel retail system, this information can be about goods, customers, inventory, delivery, returns, and the purchase and supply of goods. Therefore, channel visibility can be specifically divided into: commodity visibility, demand visibility, promotion and transaction visibility, order/payment visibility, inventory and delivery visibility, and so on. Improving the visibility of retail channels can further eliminate channel barriers and promote the cooperative operation of omni-channel retail business, which is another key task for retail enterprises to realize the transformation of omni-channel retail.

To sum up, based on the three-dimensional structure framework of the omni-channel retail system, it can be seen that the three aspects of integrating retail business, integrating channel information and removing channel barriers to improve channel visibility constitute the key path for retail enterprises to realize omni-channel transformation. Effectively promote the coordinated operation of multi-channel retail business, integrate channel information and break down channel barriers, and transform the original independent retail channel into an interconnected and coordinated all-channel retail system, which can not only effectively improve the shopping experience and purchase value of customers, but also provide a new platform for customers in the context of the digital era. Making full use of digital technology to effectively improve the operational performance and efficiency of retailers has laid a solid foundation.

4. Conclusion

4.1 Discussion and implications

This paper makes a systematic literature research on how retail enterprises achieve omni-channel transformation. Through the descriptive analysis of the sample articles, we find that the research literature, citation times and other indicators under the theme of global omni-channel retailing show a rapid rising trend after 2015. The sources of research literature show the characteristics of multi-disciplinary fields, among which

the three fields of marketing, retail management, logistics and supply chain are more concentrated. The research finds that compared with other traditional retail modes, omni-channel retail has more diversified channel types and scope, higher channel visibility without channel boundary, these advantages can bring customers the best shopping experience and maximize the purchase value. The pursuit of the above characteristics has formed a strong driving force for retail enterprises to realize omni-channel retail transformation.

Through the systematic analysis of the sample literature, this paper puts forward the view that the omni-channel retailing model is the inevitable trend of the retail industry under the background of the rapid development of digital technology, and summarizes the concept, characteristics, structural framework of omni-channel retail and the key tasks facing the omni-channel transformation from the perspective of retail management. The three-dimensional structure framework of omni-channel based on channel stage, channel type and channel agent is defined. On this basis, the key tasks for the transformation of multi-channel retail enterprises to omni-channel are put forward: integrating retail business, integrating channel information, improving channel visibility and eliminating channel barriers. This paper can provide reference and support for the follow-up research on omni-channel retail transformation to expand the research perspective, make better use of the existing research results, and provide decision-making basis for the omni-channel transformation practice of retail enterprises.

4.2 Limitations and future research

There are also some limitations. First of all, the omni-channel transformation of retail enterprises is a complex issue involving retail management, marketing, logistics and supply chain management and other multidisciplinary fields. However, this paper mainly analyzes and explores the operational management problems that need to be solved in the realization of omni-channel transformation of multi-channel retail enterprises from the perspective of operation management of retail enterprises. There is a lack of analysis of specific functions and strategies related to omni-channel transformation such as marketing, logistics and supply chain management. Secondly, as the practice of omni-channel retail is still in its initial stage, it is difficult to find successful cases for empirical study. Therefore, this paper mainly conducts theoretical analysis on how multi-channel retail enterprises achieve omni-channel transformation based on the concept, characteristics and structural framework of omni-channel retailing based on a systematic literature review. The research conclusions need to be supported by subsequent empirical research. With the development and evolution of omni-channel retailing practice, it is hoped that there will be more relevant research results with empirical basis and specific problems in the future, so as to provide more practical and operable reference and guidance for the theoretical research of omni-channel retail and the transformation and development of retail enterprises.

Acknowledgments

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