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QR Code Usage for Marketing Activities of Logistics Companies

Berk Küçükaltan[1,*], Deniz Herand[2]

[1]Brunel Business School, Brunel University, London, UB8 3PH, UK
[2]Industrial Engineering Department, Turkish-German University, 34820, Turkey

Abstract Marketing and logistics are two disciplines that complement each other in a supply chain. Logistics is comprised of various functions and one of these functions is information technology (IT). Besides supporting various operational processes, information technologies also support marketing activities of companies. Some information technologies are used both in marketing and in logistics. One of these technologies is the Quick Response (QR) code. The aim of this study is to explore and discuss the usage of the QR code technology within the marketing activities of logistics companies, particularly third-party logistics (3PL) companies. Furthermore, the usage of this technology together with social media tools is proposed. In this research, it is pointed out that if the implementation of QR codes and social media tools is fulfilled in a coordinated manner, marketing activities can be managed by logistics companies more effectively, reputation of logistics companies can be enhanced and a growth in sales, profitability and market share can be realized.

Keywords Logistics, Marketing, QR code, Social media, 3PL providers

1. Introduction

In recent years, some disciplines including supply chain management (SCM), marketing channels of distribution, logistics and purchasing have been continuously developed and advanced [1]. Supply chain is an inter-disciplinary concept and a network covering many companies involved in the process from suppliers to end-users.

The term "supply chain" was emerged in the 1980s. Since then, there have been many definitions in the literature about SCM. The Council of Supply Chain Management Professionals (CSCMP) defined SCM as follows [2]: *"Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."*

As shown in Figure 1, there are many players in a supply chain from suppliers to customers. Each of these players has different roles and executes different processes in the chain. 3PL providers are one of these important players. Logistics activities and responsibilities of 3PL providers are very significant for an effective supply chain management.

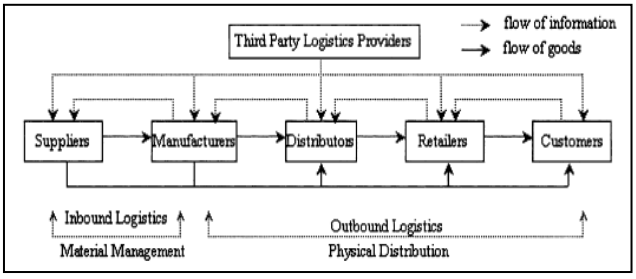

Figure 1. Supply chain process diagram [3]

Logistics is an important part of a supply chain [4] and consists of various functions. Coordinating these functions cohesively led 3PL companies to be more competitive in the industry.

Information technology (IT) is one of the functions of logistics. IT is vital to increase the competitiveness of logistics companies. There are different IT systems used in logistics. Although, previously IT was not considered primarily by logistics companies, today due to the development of the communication technologies and IT systems, 3PL companies have focused more on IT systems.

One of the IT systems used in logistics is Auto-Identification (Auto-ID) systems. Some Auto-ID systems have been already implemented by numerous companies [5]. QR code, which is commonly evaluated under Auto-ID systems, is one of the systems used for tagging in operations. QR code related studies are very rare in logistics. To the best of our knowledge, based on our literature review, using QR codes within the marketing activities of logistics companies has not been researched

* Corresponding author:
berkkucukaltan@hotmail.com (Berk Küçükaltan)
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extensively in the literature. Thus, this paper aims to close this research gap by considering the impact of QR codes on the marketing activities of 3PL companies. In this paper, QR codes and their usage are examined. The applicability of QR codes through some social media tools is also discussed. Based on the literature, definitions and the relevant themes are generally indicated.

The rest of this paper is organized as follows: In section 2, status quo of QR code usage within the marketing activities in logistics companies and their utilization through social media tools are examined. In section 3, logistics management and the role of 3PL companies for logistics management are overviewed. In section 4, some IT systems widely used in logistics are introduced. In section 5, QR code usage within the marketing activities of logistics companies, particularly 3PL companies, is proposed. The last section of this study consists of conclusion and some suggestions for further research.

2. Status Quo of QR Code Usage for Marketing Activities in Logistics

During recent years, logistics has become increasingly important [6] and it has attracted much interest from practitioners and academics. Although the importance of logistics has been emphasized in the literature, some developments are necessary in the practice. As Davis [7] pointed out, logistics companies have not primarily considered the importance of marketing activities in their operations. Based on the findings of Aktas et al. [8], word-of-mouth (WOM) referencing plays an important role for the service provider selection than other sources. The conclusion of this finding from the providers' perspective shows that 3PL companies usually enhance their recognitions with the help of their past relationships with their customers. In this regard, logistics companies should put more emphasis on their strategic marketing activities.

Recently, QR codes have also gotten much interest both from practitioners and academics. QR code is a type of two-dimensional (2D) barcode [9, 10, 11]. QR codes are one of the most common barcode formats used for some activities and, mobile tagging is one of these activities taken into account by some companies for their marketing activities [12].

QR codes are used as promotional tools for marketing activities in some firms. However, QR code usage as a promotional tool has received limited attention in the literature [13]. Also, there is a similar outcome with QR code usage in the mobile marketing communication area. As Watson et al. [11] stated, there are very few studies about QR code usage in the mobile marketing communication field and further research about marketing in the smartphone era, including the QR code usage, is necessary.

Logistics is also one of the areas for the usage of QR codes [14]. In this study, using QR codes for marketing activities of 3PL companies that generally interact with their customers in a business-to-business (B2B) context [15] is considered.

As is emphasized and indicated in the following sections, while using QR codes within the marketing activities social media tools or social networking sites can be utilized. Using social media has positive effects on brand building, sales and reputation of companies. As it was expressed in the research of Rajendra and Hemant [16], there is a connection between QR codes and some social media tools (e.g. Facebook, Twitter, LinkedIn etc.) regarding marketing. We may draw an inference about the availability of the similar outcomes in the logistics industry. QR codes can be used through some social networking sites to execute marketing activities of logistics companies effectively and to enhance their recognition levels. Logistics companies can be more competitive in the logistics market with the help of such activities.

3. Logistics Management and 3PL Companies

Logistics has an increasingly important role in supply chains [17]. The prevalent and common view in the literature is that the term "logistics" was used in the early 18th and late 19th century [18]. Logistics management is the management of the movement of goods, services, information and money from the point of origin to the end-users in supply chains. The early concept of logistics contained a single station, but nowadays logistics operations become global and include many activities such as customer response, inventory planning and management, supply, transportation, and warehousing [19].

Before the 1980s, distribution and warehouse management were mainly emphasized in logistics activities. During the 1980s, both internal and external logistics activities were used across supply chains. During the 1990s, logistics became more global and was integrated with some changes such as responsiveness to demand, increased reliability on IT and so on [1].

Due to the increasing competition in the global world, companies try to decrease their costs to be more competitive. When companies consider their costs, transportation costs appear the costliest elements in the logistics operations, especially within the international trade [20]. This situation forces many companies to outsource their logistics operations to 3PL providers and to focus more on their core competencies. Therefore, the role of 3PL companies for the sector has constantly increased in recent years.

4. IT Systems in Logistics

IT systems are widely used in the logistics industry. Using advanced IT systems enable logistics companies to get reliable and real-time information in order to satisfy their customers [21]. With the help of the developed and integrated IT systems, 3PL companies become more

competitive in the industry. From the customers' perspective, advanced and integrated IT systems play a significant role in their decision to select their logistics provider partners.

IT systems affect the operational capabilities of companies. Besides the importance of software or hardware used in IT system(s), also the importance of the following IT concepts is emphasized in the literature: automated technologies used in operations [22, 23, 24], current and advanced technologies [25, 26, 27], conducting an online link for customers [22, 25, 26], data security and/or ISO certification [23, 28].

In the traditional approach, logistics companies mainly offer transportation and warehousing services. Nowadays, as Van Hoek [29] expressed, 3PL companies try to extend their service offerings through supplying integrated activities such as production and marketing.

As Hooda et al. [30] referred, IT is one of the most significant tools for effective marketing. It helps to improve the competitiveness of companies. IT systems and their integration with other systems are very vital in the logistics industry especially within the marketing activities. To be more competitive in the industry, companies should use Internet offerings by integrating these with their IT infrastructures. Internet usage within the information systems provides stakeholders of companies, such as customers, many advantages [31]. Sharma [31] noted that the Internet has a significant effect on the information access and is used by marketers in order to enhance customer satisfaction and loyalty. Also, the author expressed that companies need to use the Internet in their marketing activities because it enables companies to become more competitive and to provide better services. Buyukozkan et al. [32] emphasized that advanced Internet offerings enable companies to become more competitive in the industry.

Besides the Internet, there are different technologies regarding companies' IT systems. Barbosa and Musetti [33] indicated that the most commonly used information systems in logistics are:

- ✓ Enterprise resource planning (ERP),
- ✓ Warehouse management system (WMS),
- ✓ Transportation management system (TMS),
- ✓ Global positioning system (GPS),
- ✓ Electronic data interchange (EDI) and Auto-ID technologies,
- ✓ Radio frequency identification (RFID) and barcode".

Musa et al. [5] noted that "Auto-ID systems include barcodes, RFID, biometrics (including fingerprinting, voice, facial and iris recognition, gait), optical character recognition (OCR), smart cards, and sensor technologies for location, temperature, pressure, humidity, vibration, etc.". The authors pointed out that RFID, barcode systems and sensor technologies are Auto-ID systems that are compatible for supply chains.

RFID and barcode systems can be used for tracking and tracing systems by logistics companies. These systems can help companies both for data identification and collection [10]. Although these systems are used for similar purposes their features are different based on their operational abilities.

Azevedo and Carvalho [34] emphasized that RFID systems are used for identification and data collection without human contact. The authors pointed out that investments in the development and improvement of RFID technologies have increased in recent years. According to the authors, besides many operational advantages of the RFID technology, namely optimization of efficiency, speeding up processes and acquiring accurate information, there are some disadvantages regarding some technical and economic issues. Similarly, Qian et al. [10] noted that RFID covers longer areas than barcodes in terms of the reading range. Nevertheless, although RFID has an increasing trend both in the practice and the academic studies, the entire replacement of RFID with barcode systems seems unlikely [5].

Barcode system is another Auto-ID system used in logistics. There are various barcode types. One-dimensional (1D) barcodes have one dimension with parallel lines while 2D barcodes are using different patterns in two dimensions in order to give some information to users [5]. Barbosa and Musetti et al. [33] indicated that "Bar codes can support various logistics activities, such as picking, vehicle loading and unloading and order tracking, especially in cases of customer complaints". Due to the low cost, universality and simplicity of barcode systems, the usage of other technologies such as RFID systems are limited [5].

As aforementioned, one of the 2D barcodes used in the practice is QR code [10] which was created by Denso Wave in 1994 [35]. Some mobile devices such as smartphones are used for scanning QR codes [35, 36]. Through scanning these codes customers get information about the products or activities. There are many advantages of QR code usage. Some of the commonly mentioned advantages are: ease of use [11, 13, 35, 37], high speed [10, 13, 35, 36], ability to store more information compared to other traditional barcodes [10, 36, 37]. Qian et al. [10] stated also that using around one hundred and fifty characters in a QR code including a mixture of numbers, letters and Chinese characters is possible. Although QR codes are still in their early stages, they seem to be popular in the near future [35]. As smartphones get more attention, QR code usage will be higher [36]. An example of a QR code is shown in Figure 2.

Figure 2. A QR code (edited from [10])

5. The Role of Using QR Codes within Social Media for Marketing Activities of Logistics Companies

As already mentioned, QR codes are one of the Auto-ID technologies [38] used for mobile tagging. In order to search the existing studies regarding their usage in logistics, the following keywords were used: "logistics", "QR Code", "Quick Response Code" and "mobile tagging". The following scientific databases were searched for the literature review: ABI/Inform, Science Direct, Emerald, Sage and EBSCOhost EJS. Table 1 was created by considering many sources (e.g. international journals, conference proceedings etc.) researched in all years. The selected words illustrated in the table were searched within the title, keywords and abstract in the databases[1] mentioned above.

Table 1. Literature review summary

	ABI/INFORM	SCIENCE DIRECT	EMERALD	SAGE	EBSCOhost EJS
logistics-QR Code	0	1	0	0	0
logistics-Quick Response Code	0	1	0	0	0
logistics-mobile tagging	0	0	0	0	0

As shown in Table 1, there is only one paper including the keywords "logistics" and "QR code"/"Quick Response code". This paper focused on the traceability of wheat flour milling systems through RFID and barcode technologies. The authors analyzed the system with some experiments in China. In the paper, QR codes were used for the identification of the packages and to obtain some information regarding the company and the product.

In our research, QR code usage within the marketing concept of logistics companies is examined. In other words, the aim of this paper is to use QR codes within the marketing activities of logistics companies, particularly 3PL companies.

Baack et al. [39] define marketing as *"discovering consumer needs and wants, creating the goods and services that meet those needs, and then pricing, promoting and delivering those goods and services."*

Marketing and logistics are two disciplines that closely interact. Schramm-Klein and Morschett [40] indicated that marketing and logistics are positively related with each other and logistics is a critical prerequisite for marketing. Therefore, the importance of the marketing activities cannot be neglected in the logistics industry.

There are many marketing strategies used by companies in practice and numerous marketing strategies have been researched by academics. Each company chooses the most convenient marketing strategy by considering some factors such as market structure, services or products, customers preferences and so on. A similar outcome can be deduced for logistics companies. In order to be competitive, logistics companies choose different marketing strategies. These different marketing strategies can affect logistics companies' performances differently because different strategies affect different performance metrics of logistics companies [41]. Some of the marketing strategies highlighted in the literature are green marketing [42], market orientation [41], European integration [43] and relationship marketing [44].

The 4P's of marketing are promotion, place (distribution), price and product [39]. QR code usage has important impacts especially on the elements "promotion" and "communication".

In the literature, QR code usage is generally defined as a promotional tool for companies. Schramm-Klein and Morschett [40] indicated that promotion is one of the collaborative marketing activities. Recently, QR codes have been used for promotional campaigns. Codes contain different kinds of information (e.g. URLs, e-mail addresses, videos, images, numbers, texts etc.) [13, 36] and are distributed via different media tools or items (e.g. magazines, newspapers, packages, receipts etc.) [13, 35].

QR code usage as a communication tool is also discussed in several studies. QR codes enable users to swap media options being used [13, 36]. Therefore, QR codes have been frequently used as a cross-media marketing tool [13]. Watson et al. [11] noted that QR codes are significant pull technologies that are used for mobile marketing communications. Likewise, Shin et al. [35] emphasized the usage of QR codes in interactive marketing and highlighted a need for QR code usage as a way of communication for companies.

B2B is one of the areas influenced by the marketing mix. Hill [45] noted that there are six main areas in which marketing mix elements are being offered and one of these areas is industrial marketing (B2B).

In the context of B2B, social media is also an important marketing tool. In the context of B2B, social media is used for marketing campaigns by many companies. Michaelidou et al. [46] stated that social media plays an important role in the B2B context and helps companies to build their brands. Since the 3PL concept includes B2B relations [15], in our research social media usage is mainly expressed within the B2B context.

Nowadays, social media has an increasing trend and the role of social media is emphasized by many researchers as well as practitioners. There are some studies considering social media tools. In the social media related papers, social networking sites such as Facebook, Twitter, MySpace and LinkedIn are highlighted by several authors. Michaelidou et al. [46] emphasized that these are the mainly used social networking sites within the marketing activities of small and medium sized companies. Baack et al. [39] noted that social media and social networking sites become important elements in marketing. According to the authors, promotional role of social media is very significant. As Hill [45] stated, digital media is primarily focused by numerous marketers from all sectors and industries. The author stated that advertising can be fulfilled by using mass media and/or

[1] The keywords were searched in the EBSCOhost EJS database within title, abstract and full text.

online mediums to inform customers.

There are some studies existing in the literature about the social media's effects on brand building and sales in the B2B context. According to Stephen and Galak [47], the traditional and social media affect the sales of companies positively. Lieb C. and Lieb K. [48] indicated that the focus on social media usage increased among most of the 3PL companies existing in North America. According to Lieb C. and Lieb K. [48], the majority of the CEOs working in the North American 3PL companies believe in social media's importance for their companies' brand building. It was also emphasized by the authors that social media usage will rise in three years. The authors mentioned that similar outcomes are available for Europe.

Michaelidou et al. [46] examined usage, barriers and measurement of social media marketing for small and medium sized B2B firms. According to the authors, most of the companies examined in their study use Facebook as a primary social media tool. It was indicated by the authors that brand building and attracting new customers are among the main reasons to use social networking sites. Furthermore, it was argued by Mangold and Faulds [49] that social media can be used as a promotional tool for companies.

There are many advantages of using social media tools within the marketing activities. Using social media does not require large investments and enables companies to have close relationships with their customers to expand their reputation, to have a significant brand building effect and to enhance their sales.

QR codes and social media interaction, particularly within the marketing activities of companies, is expressed in the literature. Shin et al. [35] implied that social media is a venue that enables QR code users to interact with online communities. The authors also expressed that companies use QR codes in their marketing activities. From this point of view, QR codes can be used within the marketing activities of logistics companies. Moreover, QR codes can be distributed rapidly and efficiently in different platforms by using social media tools.

Social media is used as a promotional or an advertising tool within marketing. The same situation is also applicable for the usage of QR codes because their usage is commonly emphasized within the promotional activities of companies. As in the case where a connection between QR codes and social media tools was expressed by Rajendra and Hemant [16], we can conclude that marketing activities of 3PL companies may become more efficient and beneficial through the implementation of QR codes and social media tools together.

6. Conclusions

In this paper, logistics, 3PL companies, IT systems used in logistics and status quo of using QR codes in logistics were discussed briefly. Following, some notions regarding social media, QR codes and mobile tagging were illustrated. The role of using QR codes for marketing activities was discussed more specifically. Furthermore, using QR codes together with some social media tools was emphasized for the execution of marketing activities effectively. It was proposed that the effects of QR codes on the competitiveness of logistics companies can increase when these codes are used integrated with social media tools.

This study has some limitations: Firstly, not many studies exist in the literature in terms of the applicability and the usage of QR codes integrated with social media in logistics. There is a scarce amount of research on the usage of these concepts within the marketing activities in logistics. Secondly, no empirical test was conducted in this study to test and validate the findings of the study. A survey and/or an empirical case study can be undertaken in future researches to test and validate the findings.

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