










Marketing in Wireless Communication: A Systematic Review

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Abstract. Wireless communication is becoming a trend in today's environment because it facilitates access to a wider range than non-wireless communication. In entrepreneurship, the product marketing process will greatly benefit if it is carried out with the right STP strategy. In addition to creating efficiencies in marketing mix activities, it also expands the reach of consumers and becomes more sophisticated. With this research study, we review the literature and relevant research data on marketing in wireless communication. In particular, we report a systematic literature review applying the PRISMA guidelines. There were 21 relevant articles on wireless communications and marketing published based on a systematic search of the Scopus database. The results show that publications on marketing in wireless communication have not been widely analyzed with various levels, quantitative, industries, and perspectives. The top research country was the United States and the most widely used stratified analysis was the network level. Industry analysis contains mostly information technology topics using a positioning and process perspective. Further research is possible, such as research into marketing in wireless communications using team levels with energy or food industry topics and a marketing element perspective, targeting, price, and place.

Keywords: Entrepreneurship · Marketing · Marketing Mix · Systematic Literature Review · Wireless Communication

1 Introduction

Wireless communication has progressed and increased the number of people using mobile devices [1]. Each service provides added value to customers, which makes the service easier to use [2]. Equipped with internet services, wireless communication provides an unprecedented level of convenience for customers [3]. One example proposes a new transaction scheme to significantly improve customer security [4]. Communication in entrepreneurship will continue to develop [5] representing the growing human responsibility for business and marketing [6]. This is very useful, especially in terms of marketing, because the benefits perceived by customers greatly affect attitudes toward

product marketing [7]. Wireless communication can access a wider range so that marketing strategies can also be significantly improved. Of all the studies, there has been no research that studies marketing in wireless communication using a Systematic Literature Review approach.

A systematic Literature Review (SLR) is a research method that identifies and synthesizes a subject area or topic by collecting relevant data [8]. This study uses qualitative data collection methods from previous studies from Scopus sources as a reference for observations [9]. The protocol used along with descriptions and notes of the steps for taking documents, documents excluded or included, and stages of analysis are also attached [10]. The question posed in this research study is, what is the state of the existing literature and research on marketing in wireless communications? From a systematic literature review point of view, this study aims to transparently review literature and research on marketing in wireless communications.

2 Methods

In this study, the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines were used and carried out in a systematic literature review. A large literature database was subjected to a literature search for complete information. We have linked keywords related to wireless communication and marketing to find and link to relevant articles in the global Scopus database. The Scopus database was used as the main source of information by scientists, as it was considered an authoritative source of scientific research. This study uses the keywords “wireless communication” and “marketing” in the title, abstract, and author keywords to retrieve relevant data from the Scopus database, as shown in Fig. 1. Data mining was limited to annual data as it collects one year of published data. The search query options used in data mining were (TITLE-ABS-KEY (“wireless communication”) AND TITLE-ABS-KEY (marketing)) AND (LIMIT-TO (SUBJAREA, “BUSI”)) AND (LIMIT-TO (SRCTYPE, “j”)) as of October 2022. We discovered 21 articles in this stage.

This SLR uses analysis of quantitative, industry, multilevel, and perspective. The quantitative analysis consists of annual publications and geographical contexts [5, 6, 9]. The multilevel analysis includes levels of individual, team, company, network, and institutional. The industry analysis includes information technology, services, manufacturing, energy, and food [8]. The perspective analysis includes segmenting, targeting, positioning, and marketing mix 7P’s [11].

3 Results and Discussion

In this study of marketing in wireless communication, the current status of the literature and previous research has been described based on analysis of quantitative, industry, multilevel, and perspective.

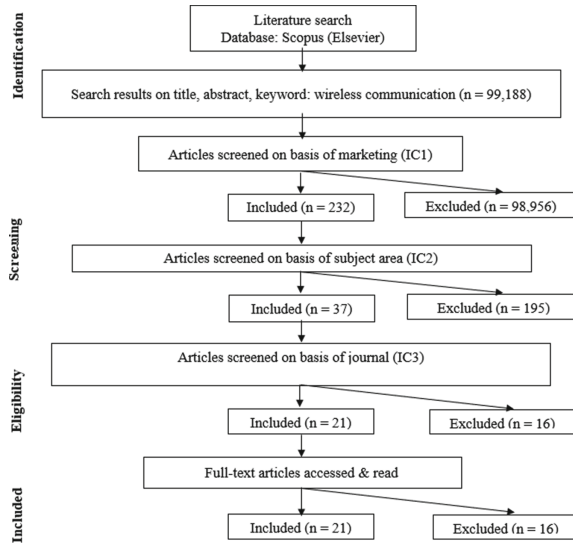


Fig. 1. PRISMA Protocols.

3.1 Publications of the Year

Figure 2 presents the 21 documents that have been published each year. Scopus database records show publications started in 1991 with one publication. However, in 1992 and 1993, no publication was recorded. In 1994 there was one publication and between 1995 and 1999 there was no publication. Then, in 2000 there was one publication but in 2001 and 2022 there were no more publications. There were publications in 2003 but no publications from 2004 until 2006. Then, there were publications in 2007 with two publications, decreased by one publication in the following year 2009. The publication with an increasing growth rate and the peak of publication annuals was in 2010. However, 2011 came down with one publication. Up slightly with two publications in 2012. From 2013 to 2015 stagnant with one publication per year. There were no publications recorded in the period 2016 to 2019. Then, there has been a resurgence of one publication every year in 2020 and 2021.

Based on these data, it can be seen that the number of publications related to marketing in wireless communication has an unstable, increasing, and decreasing growth. Marketing in wireless communication has become a trend because it offers effective solutions to communicate marketing activities, especially in the business world, so that it can reach a wider range of consumers and become easier to access [12].

3.2 Geographical Contexts

15 countries have studied marketing in wireless communications (see Fig. 3). The United States was the top research country for marketing publications in wireless communications ($n = 12$). Then followed by Italy ($n = 3$), Malaysia ($n = 3$), and Saudi Arabia ($n = 2$). Canada, China, Hong Kong, Jordan, Singapore, Taiwan, United Kingdom have

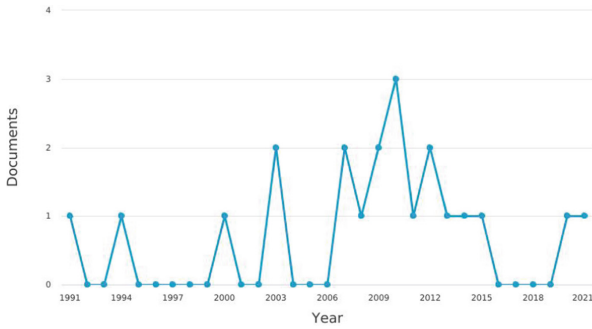


Fig. 2. The Marketing in Wireless Communication Sector’s Publications of The Year.

the same number of publications ($n = 1$). Italy, Malaysia, and Saudi Arabia were the countries that will follow the US to be most active in terms of marketing research in wireless communications.

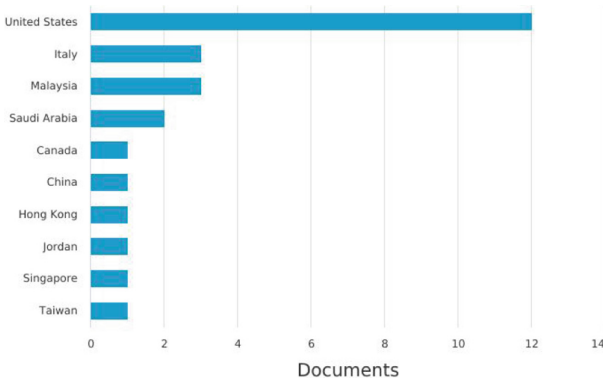


Fig. 3. Region Number of Annual Publication of Marketing in Wireless Communication

Publications on marketing in wireless communication have been researched by various countries and are not dominated by certain countries.

3.3 Multilevel and Industry Analysis

Research on marketing in wireless communication can be analyzed using multilevel and industry analysis as shown in Table 1. There were five levels of multilevel analysis and five types of industry which were the main emphasis of the studies examined [8]. Most of the publications included in this study examine wireless communication in the context of marketing by taking a network-level analysis, totaling eight articles. Four publications concentrate on the individual analysis level, two concentrates on the team level, four on the firm level, and three on the institutional level.

In the first individual-level analysis, the author discusses the email system which was considered to be the world’s premier online service [2]. The second and third authors

discuss marketing electronic media becoming more accessible and moving towards wider adoption [12] and want to drive more sales with new marketing strategies such as turning trucks into “mobile billboards” [13]. The fourth author examines imaginative companies designed to deliver targets quickly and at a low cost [14].

Two publications used team-level multilevel analysis. These articles examine the interaction of voice and SMS services provided by wireless carriers [15] which Network Management will take over in the next few years [16].

The next four articles were analyzed using the multilevel firm level. The first article explores the needs of m-commerce customers for direct marketing in the mobile environment [17]. The next article discusses increasing value-added services such as mobile broadband internet services, video streaming, etc. for postpaid subscribers [18]. The next article examines that the innovation process in this global industry is “not globalized” as a whole [19], so companies can imagine to see various possibilities and create competitive advantages [20].

Table 1. Multilevel Analysis and Industry Analysis of Marketing in Wireless Communication.

Analysis of Industry & Multilevel	Individual	Team	Firm	Network	Institutional
Information Technology	[2]	[15, 16]	[17]	[1, 3, 7, 21]	[22]
Services	[12, 13]		[18]		[4]
Manufacturing	[14]			[23–26]	
Energy			[19, 20]		
Food					[27]

Then, there were eight publications on wireless communications that analyze marketing at the network level. The first article identifies stakeholder perceptions and behaviors that can influence the success of commercialization [21]. The next article examines the effect of convenience on shopping intentions through mobile communication devices [3], then continues with an investigation of consumer factors when adopting m-commerce [1]. The next article suggests that perceived usefulness, consumer innovation, and personal attachment affect mobile marketing [7]. Then several articles predict the determinants that influence consumer expectations and intentions for marketing [23] and mobile commerce [24], examine the factors that affect consumer acceptance of mobile marketing in two global markets [25], using the Unified Theory of Acceptance Model and Use of Technology 2 (UTAUT2) [26].

There were three publications in this study taking institutional-level analysis. These articles propose a blind equalization algorithm to classify data by unsupervised learning [22], a Secure M-Commerce System (SMCS) scheme to improve the security of online shopping with credit card transactions [4], as well as the development of a decision-making model for distribution strategy [27].

Research on marketing in wireless communication can be analyzed using an industrial approach [8]. There were nine publications in the information technology industry. The service industry has been studied through four documents. Also, there were five

studies reviewing the manufacturing industry. The energy industry can be identified from two publications. Then, there was one publication reviewing the food industry.

There were several research gaps in marketing studies in wireless communications. First, service industry research has not been linked to team and network analysis. Second, the manufacturing industry has also not been linked to team, firm, and institutional analysis. Third, research in the energy industry has only recently been linked to firm analysis, while individual, team, network, and institutional analyzes have not been linked. Not much different from the food industry which was still new in terms of institutional analysis. The least researched levels of multilevel analysis for marketing in wireless communications are the team levels. The least studied industries for marketing in wireless communications were energy and food.

3.4 Perspective Analysis

In addition to analysis using multilevel and industry analysis, research on wireless communication can also be analyzed from a marketing perspective as shown in table 2. There were two factors from a marketing perspective, STP and Marketing Mix 7P which will be the main emphasis of the study being researched. The STP perspective describes the customer identification process to optimize its product value offering. Meanwhile, the Marketing Mix 7P's perspective can be considered as a process of designing, communicating, and delivering customer value with different tactical attributes [11].

Publications related to this research on STP perspective, mostly examine wireless communication in the context of marketing by taking positioning perspective analysis in the marketing process. Seven publications concentrate on the perspective of segmentation analysis. These articles investigate consumer behavior towards the adoption of m-commerce products [1], mobile commerce products [24], marketing of mobile in global markets [25], people's behavioral intentions as m-TV users [26], as well as perceptions and behaviors towards the success of advanced technological processes [21]. The next article contains psychographic conditions against physical evidence that considers email as the main online service in today's world [2]. Recent articles suggest that the physical evidence of market demand is shifting so that technical expertise is growing in some geographic areas [19].

Then five publications concentrate on the perspective of targeting analysis. These articles focus on the benefits of products by providing a level of convenience for online shopping via mobile communication devices [3]. The second article measures the usefulness of mobile information/programs for marketing [7]. The third article focuses on direct marketing in the mobile m-commerce environment thus exploring customer needs [17]. The next article suggests a difference so that the company's marketing becomes faster by breaking away from the conventional market and serving a wider reach [14]. The last article focuses on its efforts to improve its presence process and offer value-added services [18].

Next is a discussion from the positioning perspective which has the largest number of studies. These articles describe some of the differences in the product market regarding the relationship between individual-level characteristics, attitudes, and mobile marketing activities [23]. The next article would like to offer a solution for more sales with a "moving billboard" promotion strategy [13] and a one-to-one promotion strategy

Table 2. Perspective Analysis of Marketing in Wireless Communication.

Marketing Mix 7P's	STP Analysis		
	Segmenting	Targeting	Positioning
Product	[1, 24]	[3]	[23]
Price			
Promotion	[25]	[7, 14, 17]	[12, 13]
Place			
People	[26]		
Process	[21]	[18]	[4, 15, 16, 22, 27]
Physical Evidence	[2, 19]		[20]

[12]. Subsequent articles develop network management processes from non-wireless to emerging services [16], develop process blind equalization algorithms [22], improve online shopping security processes with secure m-commerce schemes [4], develop process retrieval models decisions for product distribution strategies [27], as well as developing economies of scale with physical evidence of a single business model as broad as possible [20].

Research on marketing in wireless communication can be analyzed using a marketing mix 7P's approach. There were four publications on the product topic. The promotion topic has been studied through six documents. Also, there was one study reviewing the people topic. The topic of the process can be identified from seven publications. Then, there were three publications reviewing the physical evidence topic.

There were some gaps in wireless communication research using a marketing perspective. The perspective of people has not been associated with the perspective of targeting and positioning. The physical evidence perspective has not been linked to the targeting perspective. The least researched analysis of the STP perspective for marketing in wireless communications was the targeting element. Then, the analysis of the Marketing Mix 7P's perspective that has never been studied was the price and place elements.

4 Conclusions

Marketing and its strategy are important elements in promoting the development of wireless communication. Marketing and dissemination of information about a product's value can be carried out in a wider and smoother market reach using wireless communication. This study focuses on obtaining information that ultimately research findings can be utilized related to marketing in wireless communication by providing some quantitative analysis in the related literature. The quantitative analysis carried out in this study was the annual publication and geographic location. In addition, this study presents the results of multilevel analysis (individuals, teams, companies, networks, and institutions), industry analysis (information technology, services, manufacturing, energy, and food),

as well as analysis of marketing perspectives (STP elements and marketing mix). The results of this study indicate that marketing in wireless communications has been studied in various industry fields and perspectives. Annual publications show that research trends in the field have unstable growth. However, in recent years, marketing publications in wireless communication have increased. The United States was the leading research country that has published twelve articles on marketing in wireless communications. The most frequently reviewed multilevel analysis of this topic was the network level with eight articles. In industrial analysis, information technology was a topic of discussion that was often transported. Then, the most widely discussed marketing perspective was in the positioning element of the marketing process.

Further research that has the opportunity to be carried out, especially for marketing research in wireless communication, is to use the team level by connecting the topics of the energy and food industries. Marketing studies in wireless communication with the topic of targeting, price, and place have the opportunity to be studied. The study of digital marketing in wireless communication using the metaverse and web 3.0 is also interesting. This study has limitations in using published data based on the Scopus database. It is hoped that this research can provide avenues for new research from the perspective of partial knowledge and advanced analytics.

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