

## Development of Engineering Solutions for Marketing and Communication: Adaptive Strategies in Consumer Evolution

Francisco Campines Barriá<sup>1</sup>, Johanna Maricela Bósquez Gurumendi<sup>2</sup>, Alejandra María Carpio Herrera<sup>3</sup> and Miriam Elizabeth Erazo Rodríguez<sup>4</sup>

### Abstract

*A documentary review was carried out on the production and publication of research papers related to the study of the Marketing, Communication and Engineering variables. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2018-2023, achieving the identification of 218 publications. The information provided by this platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors regarding the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that the United States, with 33 publications, was the country with the highest scientific production registered in the name of authors affiliated with institutions in that country. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of Marketing, Communication and Engineering, was Computer Science with 111 published documents, and the most used Type of Publication during the period indicated above were Conference Articles with 57% of the total scientific production.*

**Keywords:** Marketing, Communication, Engineering, Consumer.

## INTRODUCTION

At first glance, Engineering and Marketing are two areas that may seem to be very distant from each other, however, this turns out to be a statement completely removed from reality, since many of the current strategies designed in the area of marketing, take full advantage of inventions derived from modern engineering as detailed below:

**Information Technology (IT):** The development of information systems that group relevant data regarding consumer behavior is the raw material of any creation of marketing strategies, for this reason, the use of programs that not only store information, but are now capable of interpreting it, can be used by marketing experts to direct the necessary strategies in front of potential customers.

**Development Of Digital Applications And Platforms:** Currently, the development of digital platforms, applications, software and others, in charge of engineering, supports multiple areas, including marketing. The classification of information necessary for the creation of commercial strategies and the direction of them can be monitored thanks to these applications.

**Artificial Intelligence (AI) And Data Analytics:** The development of AI algorithms and systems that can predict market trends, personalize product recommendations, and optimize advertising campaigns. In addition, they build data analysis tools that allow marketers to better understand the impact of their strategies.

**Process Automation And Optimization:** By using automated systems, engineers help optimize marketing and communication processes, from sending personalized emails to managing online advertising campaigns.

---

<sup>1</sup> Universidad de Panamá; ORCID: <https://orcid.org/0000-0002-9331-756>, E-mail: francisco.campines@up.ac.pa

<sup>2</sup> Universidad Internacional del Ecuador; ORCID: <https://orcid.org/0009-0006-0634-6506>, E-mail: jobosquezgu@uide.edu.ec

<sup>3</sup> Universidad Nacional de Chimborazo, Facultad de Ciencias Políticas y Administrativas, Carrera de Comunicación; ORCID: <https://orcid.org/0000-0002-7254-7430>, E-mail: alejandra.carpio@unach.edu.ec

<sup>4</sup> Universidad Nacional de Chimborazo, Facultad de Ciencias Políticas y Administrativas, Carrera de Comunicación; ORCID: <https://orcid.org/0000-0003-1569-7245>, E-mail: miriamerazo@unach.edu.ec

From the engineering side, the above points are constantly updated and improved, in order to meet the changing demands experienced in the market. The evolution of consumers, thanks precisely to the identification of increasingly specialized needs, constitutes a great challenge in decision-making in terms of marketing strategies, since all technological support is vital in the search for their satisfaction. The functionality of current applications allows us to interpret, analyze and even predict what the new behaviors of the consumer are, and that is where the usefulness of technological tools is expected within the execution of commercial strategies.

On the other hand, advances in engineering also seek to optimize the user experience, making sure that marketing and communication solutions are accessible and attractive to a wide range of consumers, regardless of their preferred device or platform. In short, engineering plays a critical role in developing innovative solutions that adapt to constantly evolving consumers and market trends.

### General Objective

To analyze, from a bibliometric and bibliographic perspective, the preparation and publication of research papers in high-impact journals indexed in the Scopus database on the Marketing, Communication and Engineering variables, during the period 2017-2022.

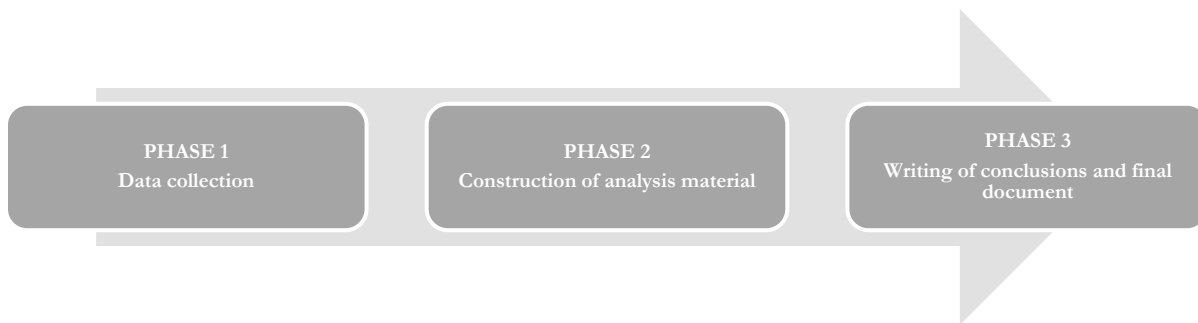
### METHODOLOGY

This article is carried out through a mixed orientation research that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of Marketing, Communication and Engineering.

a qualitative perspective, examples of some research works published in the area of study indicated above, based on a bibliographic approach that allows describing the position of different authors regarding the proposed topic. It is important to note that the entire search was carried out through Scopus, managing to establish the parameters referenced in *Figure 1*.

#### *Methodological design*



**Figure 1.** Methodological design

Source: Own elaboration

### Phase 1: Data Gathering

Data collection was carried out from the Search tool on the Scopus website, where 218 publications were obtained from the choice of the following filters:

TITLE-ABS-KEY ( marketing, AND communication, AND engineering ) AND PUBYEAR > 2017 AND PUBYEAR < 2024

Published documents whose study variables are related to the study of Marketing, Communication and Engineering

Limited to the years 2017-2022.

Without distinction of country of origin.

Without distinction of area of knowledge.

Without distinction of type of publication.

## **Phase 2: Construction Of Analysis Material**

The information collected in Scopus during the previous phase is organized and then classified by graphs, figures and tables as follows:

Co-occurrence of words.

Year of publication.

Country of origin of the publication.

Area of knowledge.

Type of publication.

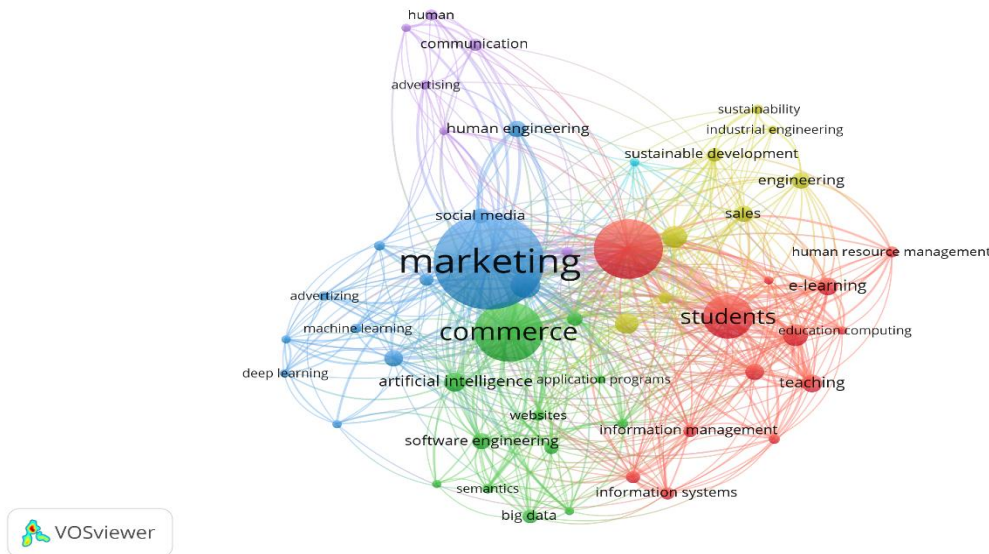
## **Phase 3: Drafting Of The Conclusions And Final Document**

In this phase, the analysis of the results previously yielded is carried out, resulting in the determination of conclusions and, consequently, the obtaining of the final document.

## **RESULT**

### **Word Co-Occurrence**

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.



**Figure 2.** Word co-occurrence

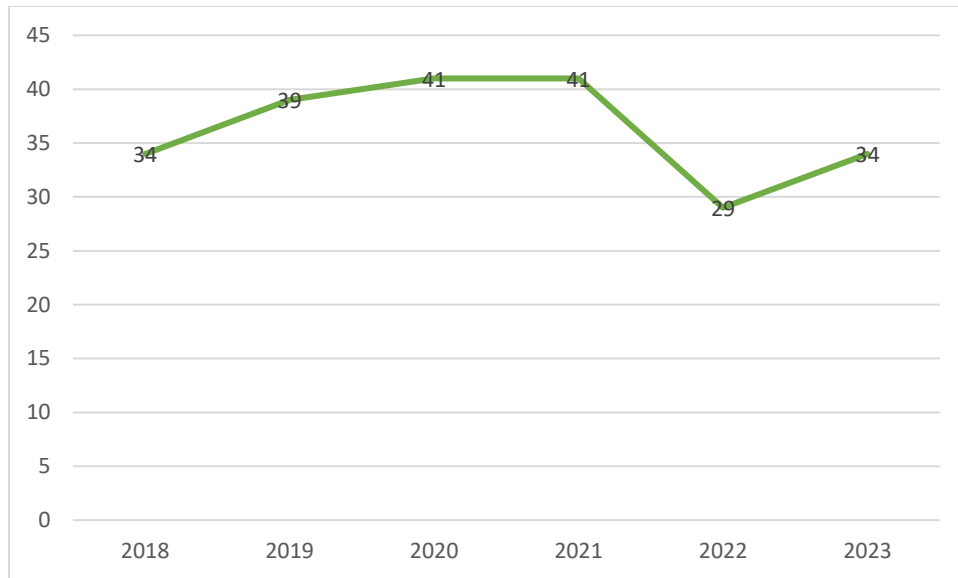
Source: Own elaboration (2024); based on data exported from Scopus.

Marketing was the keyword most frequently developed within the research identified for subsequent analysis in this research, supported by topics such as Social Networks, Machine Learning, Artificial Intelligence, which account for its proximity to topics developed from the Engineering area. Commerce represents a keyword studied in the same way around variables such as Applications and Programs, Engineering Programs, Big Data, Websites, which allows us to infer that in the same way, commercial activity today is supported by a whole

universe of technological resources based on the relationship between company and customer and it is absolutely necessary to have today. with the effective management of information almost in real time, from customers for an effective application of commercial strategies, from the first contact with them to the planning of after-sales services, as is the case with CRMs (*Customer Relationship Management*) that are even capable of predicting consumer behavior through the analysis of large amounts of information (Big Data) and its subsequent analysis by the dependencies of marketing within the organization, which through correct decision-making, can achieve a close relationship with their current customers, including potential ones, if this information provided by the applications, is interpreted correctly.

### Distribution Of Scientific Production By Year Of Publication

Figure 3 shows how scientific production is distributed according to the year of publication.



**Figure 3.** Distribution of scientific production by year of publication.

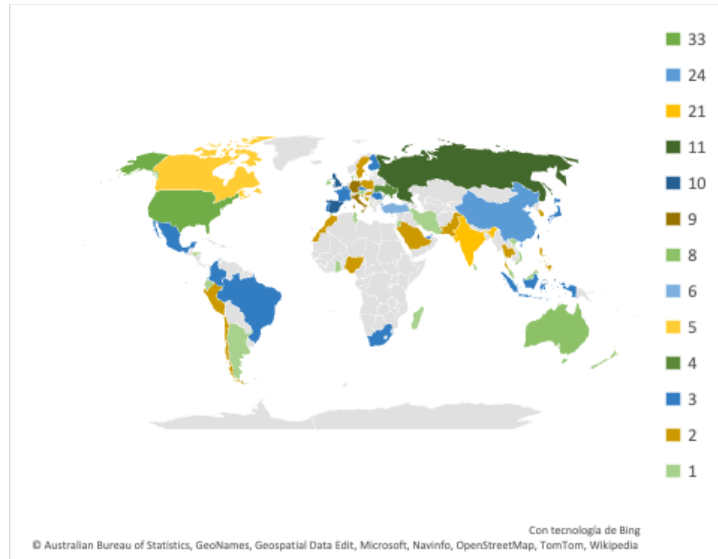
Source: Own elaboration (2023); based on data exported from Scopus

As shown in the previous figure, the volume of scientific production recorded in Scopus, around the study of the relationship between Engineering and Marketing during the period between 2018 and 2023, remained in constant growth until 2021 when the largest number of publications was registered, 41 in total, the same as the immediately previous year. However, for 2022 there is a significant drop in the volume of registrations, reaching 29 only representing this figure, the lowest number of research papers registered on the aforementioned platform during the period analyzed. For 2023, a total of 34 documents were registered, which allows us to infer that studies related to the variables addressed in this document are once again satisfactorily resumed. Within the latter, it is important to highlight the article entitled "Artificial intelligence techniques applied to precision marketing: a survey" whose objective was to present a survey on the current trends of AI applications in precision marketing, taking into account the arrival of great technological advances once we entered the XXI century which included AI and Big Data, therefore, marketing supported the design of its strategies, in the analysis of large amounts of information through virtual mechanisms, which turned out to be of great value for companies globally, flexible in the face of changes and determined to make the most of technological advances in communication and data analysis. The aforementioned article reviews the AI approaches that have been and are applied in the area of precision marketing in the literature, which have been subdivided into three categories, namely: Machine Learning, Data Mining and Recommendation Systems. As a result, the paper finds that RF, SVM, and NN, for machine learning, K-means, Naïve Bayes, and CHAID Decision Tree for data mining, and collaborative filtering for recommendation systems provide better results in the literature. The above, in response to the need to identify which are the most useful applications in the three categories mentioned above, so this result provides useful recommendations to companies interested in carrying out tasks such as searching,

analyzing and interpreting large volumes of information that will then be processed to give rise to more effective strategies in terms of marketing. (El Koufi & Belangour, 2023)

### **Distribution Of Scientific Production By Country Of Origin**

*Figure 4* shows how scientific production is distributed according to the country of origin of the institutions to which the authors are affiliated.



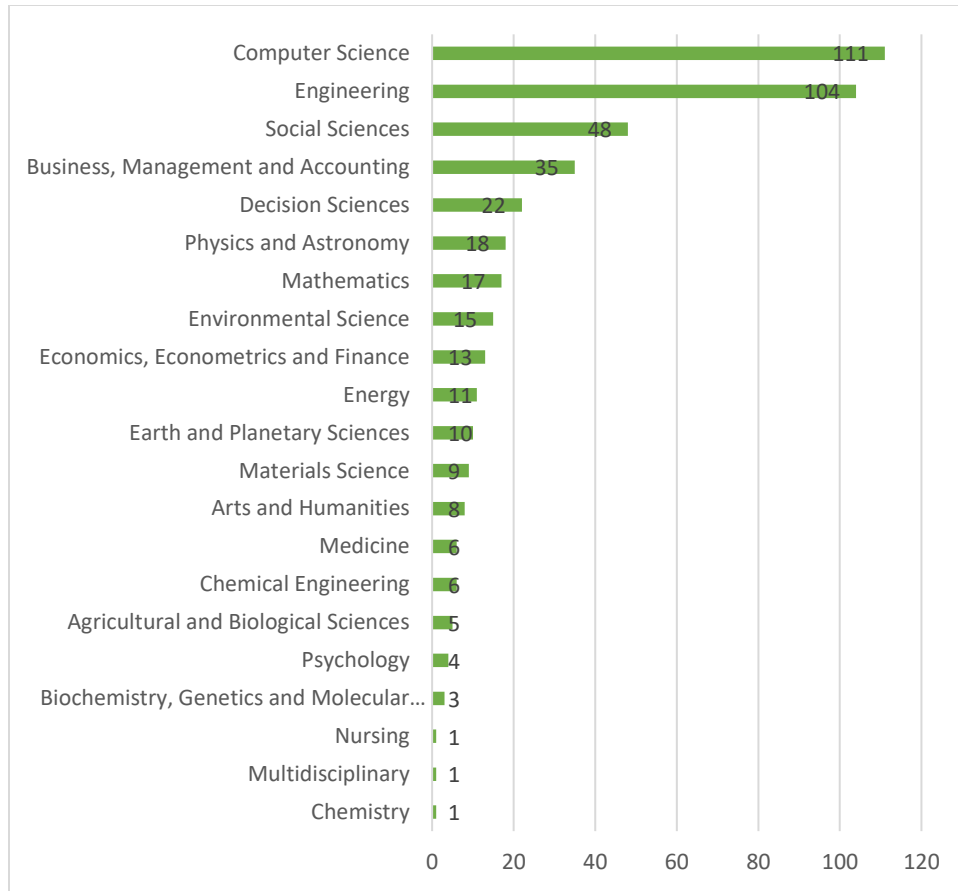
**Figure 4.** Distribution of scientific production by country of origin.

Source: Authors' elaboration (2024); based on data provided by Scopus.

The United States was the country with the highest number of publications indexed in the Scopus database with a total of 33 documents registered during the period 2018-2023, followed by China with 24, India with 21 and Russia with 11. From the above, it can be inferred that the management of large volumes of information as proposed through Big Data, is of course, absolutely necessary, especially in countries with a large population, as is the case in the aforementioned countries, so the work of companies, for the analysis of data and their subsequent decision-making, today it is almost mandatory to use technological tools capable of interpreting this entire set of vital information for the design and implementation of marketing strategies. Latin American countries are also present in the count of research works related to Marketing and the solutions provided through tools designed from engineering; Brazil, Mexico and Colombia contribute 3 documents each, related to the aforementioned topic. Of the registered works by authors affiliated with Colombian institutions, the one entitled "Marketing information systems in the management of COVID-19" stands out, which precisely manages to compile the relevant information on the contribution that information systems have in the management of marketing during the time of health contingency due to Covid-19 and how companies can prepare for possible similar events in the future. in terms of directing marketing strategies in this type of situation. (Ruiz Andrade, Omaira Cecilia, Verjan Quiones, & Robledo Fernandez, 2021)

### **Distribution Of Scientific Production By Area Of Knowledge**

*Figure 5* shows the distribution of the preparation of scientific publications based on the area of knowledge through which the different research methodologies are implemented.



**Figure 5.** Distribution of scientific production by area of knowledge.

Source: Own elaboration (2024); based on data provided by Scopus

Computer Science turned out to be the area of knowledge that had the greatest influence within the writing and publication of research papers related to the development of engineering solutions for marketing and communication, due to the very nature of the study a total of 111 documents based their methodologies on theories associated with this area. In second place, Engineering with 104 publications, and, in third place, Social Sciences with 48. The directly impacted area of knowledge, Business, Administration and Accounting ranks fourth with 35 publications among which is the article entitled "Exploring the economic impact of the integration of commercial technology in interactive art of new media and visual communication design" whose objective was to examine how emerging technologies in new media art, such as augmented reality (AR), virtual reality (VR) and interactive digital platforms, are revolutionizing the design of visual communication therefore impacting commercial activity in each economic sector. It is undeniable the contribution that aspects such as AR exert on commercial strategies, such as the experience provided to potential customers and even to current customers, the design of marketing and advertising strategies can help arouse interest in the public, as well as create the desire to acquire a product or service. The above, added to the economic benefit that the inclusion of this type of technology in their organizational culture can bring to companies, since, through this strategy, they can open up to new markets, bring new customers and even retain current ones. (Yin, 2023)

### Type Of Publication

In the following graph, you will see the distribution of the bibliographic find according to the type of publication made by each of the authors found in Scopus.

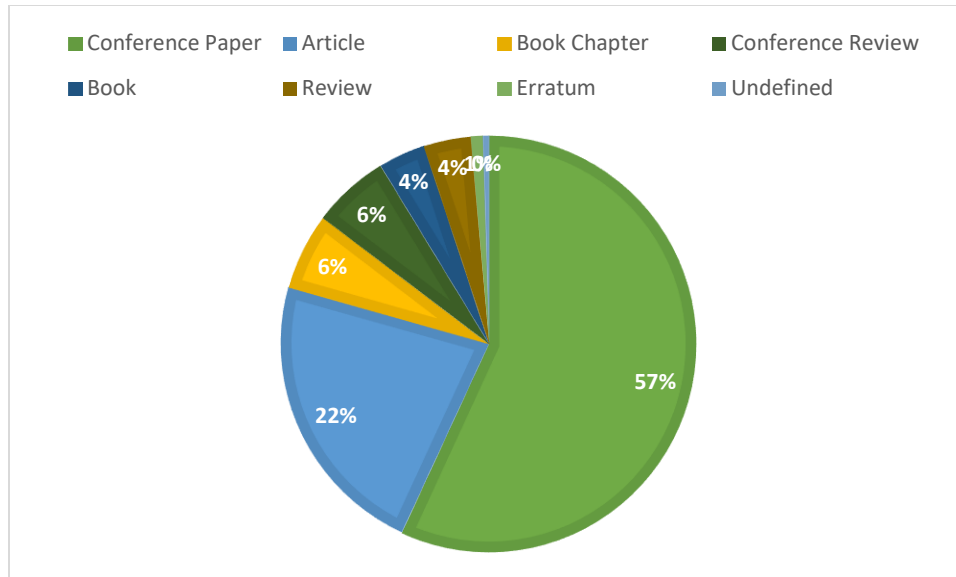


Figure 6. Type of publication.

Source: Authors' elaboration (2024); based on data provided by Scopus.

57% of the papers identified by executing the proposed search in the Scopus database correspond to Conference Papers. 22% Journal Articles, and 6% Book Chapters. Within this last typology is the document entitled "Integration of corporate marketing and digital public relations materials in LSP courses" whose objective was to present a project on the integration of authentic digital corporate marketing and public relations materials in LSP courses for engineering and economics students. It is expected that, once the proposed project is executed, digital PR and marketing materials will be involved in the organization to enhance the LSP program student experience. (Bovtenko, Kuchina, & Morozova, 2020)

## CONCLUSION

Thanks to the bibliometric analysis proposed for the writing of this review article, it is possible to conclude that countries such as the United States, Russia, India and China, with an extremely large population, are those that apply the greatest effort to research regarding the handling, storage, analysis and interpretation of large volumes of information due to the demands present in the market derived precisely from the amount of data that is completely usable in the design of commercial and marketing strategies by small, medium and large companies, since this represents an opportunity for the growth of the field of action of each of the organizations present in a market as competitive as those of the countries mentioned above, and how this data processed through Big Data tools can become raw material for the development of routes aimed at the search for new customers, loyalty of current customers and a closer management with them such as CRM strategies where it is sought to consolidate a direct and lasting relationship with each of the consumers of certain products and/or services. On the other hand, it is important to highlight the contribution that technological advances in engineering issues for information and communication have on marketing, they are studied through theories immersed in the area of Computer Science mostly, which allow highlighting the functionality of technological advances based on the realization of plans and projects related to the area of marketing in organizations and as dependent processes of this specific area, can be more efficient and effective if the different technological resources available to it are taken advantage of. However, the economic benefits perceived by companies that take advantage of each digital or technological resource to improve their communication with the different stakeholders is remarkable since it can seek new markets, generate increases in demand, optimize resources in production chains, and have a more direct relationship with consumers and customers, both potential and current. Once the results expressed in this document have been presented, it is possible to affirm that the contribution of engineering to marketing and communication is highly positive in improving all the processes that comprise decision-making based on data processing.



## REFERENCES

- Ballesteros-López, L., Peñaherrera-Zambrano, S., Armas-Arias, S., & López-Pérez, S. (2021). Web 2.0 Digital Marketing Tools in the Ecuadorian Tourism Sector Against of the COVID-19 Pandemic. *Lecture Notes in Networks and Systems* Volume 411 LNNS, Pages 615 - 626 2022 14th International Conference on Interactive Mobile Communication, Technologies and Learning, IMCL 2021 Virtual, Online 4 November 2021 through 5 November 2021 Code 276629.
- Bovtenko, M. A., Kuchina, S. A., & Morozova, M. A. (2020). Integrating Corporate Digital PR and Marketing Materials in LSP Courses. In *Proceedings of the Conference "Integrating Engineering Education and Humanities for Global Intercultural Perspectives"*, pp. 439-448.
- El Koufi, N., & Belangour, A. (2023). Artificial intelligence techniques applied in precision marketing: a survey. In *2023 3rd International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*.
- Han, H., Xiong, J., & Zhao, K. (2022). Digital inclusion in social media marketing adoption: the role of product suitability in the agriculture sector. *Information Systems and e-Business Management*, 657 - 683.
- Ruiz Andrade, J. G., Omaira Cecilia, M. M., Verján Quiñones, R., & Robledo Fernández, J. C. (2021). Marketing Information Systems in the Management of COVID-19. In *Artificial Intelligence, Computer and Software Engineering Advances: Proceedings of the CIT 2020 Volume 2*, 298-309.
- Sombultawee, K., & Wattanatorn, W. (2022). Management of social selling and B2B customer-brand engagement: Is direct selling on social media good for your brand and relationships? *Electronic Commerce Research and Applications*.
- Yin, H. (2023). Exploring the Economic Impact of Commercial Technology Integration in New Media Interactive Art and Visual Communication Design. *Journal of Commercial Biotechnology*, Volume 28, *Journal of Commercial Biotechnology*.
- Ballesteros-López, L., Peñaherrera-Zambrano, S., Armas-Arias, S., & López-Pérez, S. (2021). Web 2.0 Digital Marketing Tools in the Ecuadorian Tourism Sector Against of the COVID-19 Pandemic. *Lecture Notes in Networks and Systems* Volume 411 LNNS, Pages 615 - 626 2022 14th International Conference on Interactive Mobile Communication, Technologies and Learning, IMCL 2021 Virtual, Online 4 November 2021 through 5 November 2021 Code 276629.
- Han, H., Xiong, J., & Zhao, K. (2022). Digital inclusion in social media marketing adoption: the role of product suitability in the agriculture sector. *Information Systems and e-Business Management*, 657 - 683.
- Sombultawee, K., & Wattanatorn, W. (2022). Management of social selling and B2B customer-brand engagement: Is direct selling on social media good for your brand and relationships? *Electronic Commerce Research and Applications*.
- Akel, G. (2020). Management and marketing events in a digital era: Opportunities and challenges. *Impact of ICTs on event management and marketing* (pp. 105-122) doi:10.4018/978-1-7998-4954-4.ch007 Retrieved from www.scopus.com
- Akinboade, O. A., Taft, T., Weber, J. F., Manoko, O. B., & Molobi, V. S. (2022). Correlates of access to ICT and food security of the poor in south Africa's soshanguve. *GeoJournal*, 87(6), 5165-5178. DOI:10.1007/S10708-021-10550-Y
- Alalwan, A. A., Baabdullah, A. M., Dwivedi, Y. K., Rana, N. P., Lal, B., & Raman, R. (2021). Et-moone and marketing relationship governance: The effect of digital transformation and ICT during the COVID-19 pandemic. *Industrial Marketing Management*, 98, 241-254. doi:10.1016/j.indmarman.2021.09.001
- Andión, J. L. Z. (2019). Engagement and new narratives in the design of the digital communication. [Engagement and new narratives in the design of digital communication] *Studies on the Journalistic Message*, 25(2), 1249-1261. doi:10.5209/esmp.64836
- Aramendia, G. Z., Ruiz, E. C., & Nieto, C. H. (2021). Digitalization of the wine tourism experience: A literature review and practical applications. [The Digitalization of the Wine Tourism Experience: A Review of the Literature and Practical Applications] *Doxa Comunicación*, (33), 257-283. doi:10.31921/doxacom.n33a930
- Armas-Arias, S., González-Sánchez, A., Monge-Martínez, J., & Infante-Paredes, R. (2022). Web 2.0 education tools as support in digital marketing: Tungurahua case study doi:10.1007/978-3-030-96296-8\_96 Retrieved from www.scopus.com
- Arteaga Cisneros, J. P., Coronel Pérez, V. C., & Acosta Véliz, M. M. (2018). Marketing's influence in the PYME's development in Ecuador. [Influence of digital marketing on the development of MSMEs in Ecuador] *Spaces*, 39(47) Retrieved from www.scopus.com
- Bakar, M. S. A., Hassan, S., Ta'a, A., Yasin, A., Sheng, A. J., Suhaimi, S., & Yin, K. Y. (2020). Identify entrepreneurial opportunity by mining data from social media. *International Journal of Advanced Science and Technology*, 29(6 Special Issue), 1778-1782. Retrieved from www.scopus.com
- Ballesteros-López, L., Peñaherrera-Zambrano, S., Armas-Arias, S., & López-Pérez, S. (2022). Web 2.0 digital marketing tools in the Ecuadorian tourism sector against of the COVID-19 pandemic doi:10.1007/978-3-030-96296-8\_55 Retrieved from www.scopus.com
- Bismo, A., Putra, S., & Melysa. (2019). Application of digital marketing (social media and email marketing) and its impact on customer engagement in purchase intention: A case study at PT. Soltius Indonesia. Paper presented at the Proceedings of 2019 International Conference on Information Management and Technology, ICIMTech 2019, 109-114. doi:10.1109/ICIMTech.2019.8843763 Retrieved from www.scopus.com
- Bisoi, S., Roy, M., & Samal, A. (2020). Impact of artificial intelligence in the hospitality industry. *International Journal of Advanced Science and Technology*, 29(5), 4265-4276. Retrieved from www.scopus.com
- Bochert, R., Cismaru, L., & Foris, D. (2017). Connecting the members of generation Y to destination brands: A case study of the CUBIS project. *Sustainability (Switzerland)*, 9(7) doi:10.3390/su9071197



- Bossey, A. (2020). Accessibility all areas? UK live music industry perceptions of current practice and information and communication technology improvements to accessibility for music festival attendees who are deaf or disabled. *International Journal of Event and Festival Management*, 11(1), 6-25. doi:10.1108/IJEFM-03-2019-0022
- Calabretta, G., & Kleinsmann, M. (2017). Technology-driven evolution of design practices: Envisioning the role of design in the digital era. *Journal of Marketing Management*, 33(3-4), 292-304. doi:10.1080/0267257X.2017.1284436
- Caputo, F., Fiano, F., Riso, T., Romano, M., & Maalaoui, A. (2022). Digital platforms and international performance of Italian SMEs: An exploitation-based overview. *International Marketing Review*, 39(3), 568-585. doi:10.1108/IMR-02-2021-0102
- Carvalho, S., & Carvalho, J. V. (2020). The implications of digital marketing and e-commerce in the tourism sector growth doi:10.1007/978-981-15-2024-2\_15 Retrieved from www.scopus.com
- Castro, J. P. (2018). Transmedia literacy and its repercussions on the academic use of the internet. Paper presented at the Iberian Conference on Information Systems and Technologies, CISTI, 2018-June 1-5. doi:10.23919/CISTI.2018.8399363 Retrieved from www.scopus.com
- Chandra, P., Ahmed, S. I., & Pal, J. (2017). Market practices and the bazaar: Technology consumption in ICT markets in the global south. Paper presented at the Conference on Human Factors in Computing Systems - Proceedings, 2017-May 4741-4752. doi:10.1145/3025453.3025970 Retrieved from www.scopus.com
- Chaudhary, S., & Suri, P. K. (2022). A multivariate analysis of agricultural electronic trading adoption. *Journal of Scientific and Industrial Research*, 81(9), 932-939. doi:10.56042/JSIR. V81I09.59538
- Chaudhuri, S. (2018). Application of web-based geographical information system (GIS) in e-business. *Digital marketing and consumer engagement: Concepts, methodologies, tools, and applications* (pp. 649-665) doi:10.4018/978-1-5225-5187-4.ch033 Retrieved from www.scopus.com
- Cheuk, S. C. -, Atang, A., Lo, M. -, & Ramayah, T. (2017). Community perceptions on the usage of digital marketing for homestays: The case of ba'kelalan, Malaysia. *International Journal of Business and Society*, 18(S4), 775-782. Retrieved from www.scopus.com
- Cowan, K., Ketron, S., & Kostyk, A. (2020). Using virtual reality to enhance brand experiences: An abstract doi:10.1007/978-3-030-42545-6\_185 Retrieved from www.scopus.com
- Cunha, M., Correia, R., & Carvalho, A. (2021). The potential of digital marketing in the promotion of low-density territories: The case study of mirandela municipality doi:10.1007/978-3-030-90241-4\_53 Retrieved from www.scopus.com
- da Silva-Pina, A. J., Hernández-Mogollón, J. M., & Campón-Cerro, A. M. (2018). Tourism destination management organization website usability: A qualitative evaluation model. [The Usabilidade de um website de uma Organização de Gestão de um Destino Turístico (DMO): Um modelo de avaliação qualitativa] *Revista Portuguesa de Estudos Regionais*, (49), 23-40. Retrieved from www.scopus.com
- Das, D. K. (2021). Revitalising south african city centres through ICT. *Urban Planning*, 6(4), 228-241. doi:10.17645/up.v6i4.4381
- Daud, A., Farida, N., Andriyansah, & Razak, M. (2018). Impact of customer trust toward loyalty: The mediating role of perceived usefulness and satisfaction. *Journal of Business and Retail Management Research*, 13(2), 235-242. DOI:10.24052/JBRMR/V13IS02/ART-21
- de la Calle, A., Freije, I., Ugarte, J. V., & Larrinaga, M. Á. (2020). Measuring the impact of digital capabilities on product-service innovation in Spanish industries. *International Journal of Business Environment*, 11(3), 254-274. doi:10.1504/IJBE.2020.110904
- Del Vacchio, E., Gargiulo, R., & Bifulco, F. (2020). Digital communication and museum experience. A multichannel approach. *Micro and Macro Marketing*, 29(3), 513-533. DOI:10.1431/98620
- Demydov, I., Baydoun, N. A., Beshley, M., Klymash, M., & Panchenko, O. (2020). Development of basic concept of ICT platforms deployment strategy for social media marketing considering tectonic theory. *EUREKA, Physics and Engineering*, 2020(1), 18-33. doi:10.21303/2461-4262.2020.001101
- Deora, M. S. (2019). A perception of ICT and social media for online purchasing trends. Paper presented at the Proceedings of the 2nd World Conference on Smart Trends in Systems, Security and Sustainability, WorldS4 2018, 16-21. doi:10.1109/WorldS4.2018.8611590 Retrieved from www.scopus.com
- Dong, S., Yang, L., Shao, X., Zhong, Y., Li, Y., & Qiao, P. (2021). How can channel information strategy promote sales by combining ICT and blockchain? Evidence from the agricultural sector. *Journal of Cleaner Production*, 299 doi:10.1016/j.jclepro.2021.126857
- Drozdowska, M., & Duda-Seifert, M. (2018). The most popular cultural tourist attractions in Poland and the Czech Republic and their digital communication with customers (B2c). Paper presented at the Proceedings of the International Conference on Tourism Research, 31-40. Retrieved from www.scopus.com
- Dubovik, M. V., Novikova, E. S., & Sigarev, A. V. (2018). The role of information communications technology in the development of companies' business strategies: The Russian experience. *International Journal of Civil Engineering and Technology*, 9(10), 1131-1139. Retrieved from www.scopus.com
- Duffett, R., Petroşanu, D. -, Negricea, I. -, & Edu, T. (2019). Effect of YouTube marketing communication on converting brand liking into preference among millennials regarding brands in general and sustainable offers in particular. Evidence from South Africa and Romania. *Sustainability (Switzerland)*, 11(3) doi:10.3390/su11030604
- Dzbor, M., Tapak, J., Rabatin, P., & Hrusovsky, T. (2017). From school-company collaboration on educating students to a structured career development system. Paper presented at the ICETA 2017 - 15th IEEE International Conference on

- Emerging eLearning Technologies and Applications, Proceedings, doi:10.1109/ICETA.2017.8102481 Retrieved from www.scopus.com
- Fauzi, T. H., Harits, B., Danial, R. D. M., & Komariah, K. (2020). Adaptive strategies of external environmental effects in digital entrepreneurship in the strategic management perspective. *Academic Journal of Interdisciplinary Studies*, 9(3), 38-45. DOI:10.36941/AJIS-2020-0040
- Fernandes, J., Martins, J., Teixeira, M. S., Branco, F., Gonçalves, R., Au-Yong-Oliveira, M., & Moreira, F. (2018). Incorporating innovative ICT in child-oriented marketing - A retail sector case study. Paper presented at the Proceedings of the European Conference on Innovation and Entrepreneurship, ECIE, , 2018-September 1006-1014. Retrieved from www.scopus.com
- Fernández-Ges, A. (2018). The rise of mixed-use urban developments and digital districts. *Urban visions: From planning culture to landscape urbanism* (pp. 217-226) doi:10.1007/978-3-319-59047-9\_21 Retrieved from www.scopus.com
- García, S. C., García, D. A., & Blanco, T. P. (2017). Practices, skills and trends in digital advertising. the perspective of Spanish advertisers. [Practices, Competencies and Trends in Digital Advertising Communication: A View from the Perspective of Spanish Advertisers] *Latin Journal of Social Communication*, 72, 1648-1669. doi:10.4185/RLCS-2017-1239
- Gaur, S., Sahu, H., & Singh, K. (2020). ICT-enabled business promotion approach through search engine optimization doi:10.1007/978-981-32-9343-4\_39 Retrieved from www.scopus.com
- Gaur, S., Sharma, L., & Pandya, D. D. (2019). A perception of ICT for social media marketing in india doi:10.1007/978-981-13-7150-9\_52 Retrieved from www.scopus.com
- Giotopoulos, I., Kontolaimou, A., & Tsakanikas, A. (2022). Digital responses of SMEs to the COVID-19 crisis. *International Journal of Entrepreneurial Behaviour and Research*, 28(7), 1751-1772. doi:10.1108/IJEBR-11-2021-0924
- Gössling, S. (2021). Tourism, technology and ICT: A critical review of affordances and concessions. *Journal of Sustainable Tourism*, 29(5), 733-750. doi:10.1080/09669582.2021.1873353