

# International Journal **VALLIS** **AUREA**

Volume 9 • Number 2 • December 2023  
ISSN 2412-5210 e-ISSN 1849-8485



## Editor's note

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The Journal enables authors to present their research on advancing and improving the practice and understanding of the organisation's information systems. The Journal accepts theoretical, methodological and empirical contributions, i.e. the works that significantly contribute to the thematic fields of the Journal, i.e. management, finance, marketing, law, IT technology, agriculture, and other interdisciplinary topics. It will provide enough space for original empirical and developmental research.

The works can be presented as:

- Theoretical, detailed and empirical research on interdisciplinary science's conception, structure, development and usefulness is essential for progressing theory and practice.
- Paradigmatic, methodological aspects of design, development and implementation of science and practice.
- Analysis and evolution of science and practice to the social, economic, organisational and management aspects of the environment and organisation.

The International Journal Vallis Aurea is a biannual journal that pretends to affirm the integral, holistic view of interdisciplinary research. The journal aims to unite academic methodology and sincerity with professional focus and practices.

We are dedicated to achieving and maintaining this journal's high standards. All articles submitted for publication in this journal are subjected to a double-blind review process performed by at least two academics from the Editor's Board. Reviewers stay anonymous. Authors will receive written notification of acceptance, remarks, comments and evaluation of their articles in a timely manner. Authors are responsible for ensuring that all manuscripts (whether original or revised) are accurately type before the final submission. If requested, one proof set will be sent to authors before the final publication, which must be returned promptly.

This publication was reproduced by using the papers supplied by their authors. The layout, figures and tables of some papers needed to conform more precisely to the standard requirements. In some cases, the layout of the papers was rebuilt. Therefore, the readers are asked to excuse any deficiencies in this publication that may have arisen from the above causes. The editors of the Journal are not responsible either for the statements made or for the opinions expressed in this publication.

With all our hearts and sincerity, we wish to express our deepest gratitude to all the authors, reviewers, and editorial board members for their valuable contribution to this journal. We look forward to successful cooperation.

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Received: October 12, 2023

Accepted for publishing: November 15, 2023

## EXPLORING THE ROLE OF SOCIAL MEDIA MARKETING IN SHAPING PURCHASING INTENTIONS FOR T-SHIRTS IN SRI LANKA

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### **Abstract**

**Purpose:** This research aims to investigate the influence of social media marketing on consumers' purchasing intention in the context of the T-shirt industry in Sri Lanka. It seeks to understand how factors such as Informativeness, Trendiness, Interactivity, Personalization, and Word-of-Mouth (WOM) contribute to consumers' willingness to make T-shirt purchases.

**Design:** The study adopts a quantitative research design, collecting data from 351 individuals actively using social media platforms in the Colombo District of Sri Lanka. It employs a structured questionnaire to assess demographic characteristics, social media marketing factors, and purchasing intention.

**Methodology:** Data cleansing protocols were applied to ensure data accuracy, including outlier detection and mean replacement for random missing values. Reliability testing employed Cronbach's Alpha coefficients, confirming the internal consistency of measurement scales. Correlation and linear regression analyses were performed to examine relationships between variables and identify the impact of social media marketing on purchasing intention.

**Approach:** The research employs a systematic and rigorous approach, adhering to established protocols and statistical assumptions. It evaluates the validity and reliability of the data, assesses normality and linearity, and examines multicollinearity concerns. This approach ensures the credibility and consistency of the research findings.

**Findings:** The study reveals that social media marketing factors, including Informativeness, Trendiness, Interactivity, Personalization, Word-of-Mouth, and the overall Social Media Marketing model, significantly influence consumers' purchasing intention. These factors collectively account for 19.8% of the variability observed in purchasing intention.

**Originality:** This research contributes to the field by providing empirical evidence of the impact of social media marketing on purchasing intention in a specific industry and geographical context. It emphasizes the importance of integrating social media marketing into marketing strategies for T-shirt businesses in Sri Lanka. Additionally, the study encourages further research into moderating and mediating factors, offering recommendations for future investigations.

**Keywords:** Social Media Marketing, Purchasing Intention, T-shirt Industry, Sri Lanka  
Consumer Beha



## **1. Background of the Study**

The T-shirt industry in Sri Lanka has experienced notable changes in recent years, primarily due to the emergence of social media as a potent marketing tool. This research examines the impact of social media marketing on consumer purchasing intention in the dynamic industry, intending to offer valuable insights for businesses operating in this domain.

The T-shirt industry in Sri Lanka has witnessed significant players, such as **ABC Holdings** Ltd, operating under the trade name ABC, successfully adjusting to evolving market dynamics. ABC, which primarily targeted the business-to-business (B2B) sector by providing personalised apparel to diverse enterprises, encountered obstacles, such as a decrease in sales that can be partially attributed to the impact of the Easter Sunday bomb blast in 2019. In response, the organisation redirected its attention towards the business-to-consumer (B2C) market, a shift that required the implementation of proficient marketing tactics in order to achieve a competitive advantage.

The aforementioned transition prompted ABC to investigate the potential of social media as a cost-efficient method for promoting their merchandise and engaging with customers to acquire and retain them. Recognising the significant impact of social media in their emerging market, they initiated an endeavour to formulate a meticulously designed Social Media Marketing Program.

The primary inquiry driving this study is: “What is the impact of social media marketing on the intention to purchase within the T-shirt industry in Sri Lanka?”

In order to investigate this inquiry, the research conducted a preliminary survey encompassing a sample size of 30 participants. Additionally, industry professionals, such as retail shop owners and salespersons, were actively involved in the study. The research findings underscored the significance of comprehending the preferences and behaviours of the target demographic, indicating that individuals aged 16-36 represent the most appealing segment for T-shirt merchandise. Furthermore, the research conducted in Sri Lanka has revealed that WhatsApp is the predominant social media platform in terms of adoption, with Facebook, YouTube, and Instagram following suit. Additionally, it is worth noting that a significant finding emerged from the study, indicating that 73% of participants employ social media platforms to make findings, underscoring the importance of establishing a solid and comprehensive online presence. Insights provided by retail experts highlighted the significance of brand recognition in customers’ T-shirt purchasing decisions.

The aforementioned context establishes a foundation for a thorough examination of how social media marketing strategies can significantly impact the intention to purchase within the T-shirt industry in Sri Lanka. This analysis provides valuable insights for businesses aiming to leverage the potential of social media platforms in their marketing initiatives.

The study’s objectives and the accompanying research questions are designed to examine the influence of different factors related to social media marketing on the intention to purchase within the T-shirt industry in Sri Lanka. The research objectives are formulated to investigate and examine the correlation between these factors and the intention to make a purchase.

## **2. Research Objectives**

Examine the influence of social media marketing factors (Interactivity, Informativeness, Personalization, Trendiness, and Word of Mouth) on purchasing intention within the Sri Lankan T-shirt industry.

Assess how these social media marketing factors (Interactivity, Informativeness, Personalization, Trendiness, and Word of Mouth) affect purchasing intention in the Sri Lankan T-shirt industry.

Identify the most dominant dimension among these social media marketing factors in shaping purchasing intention in the Sri Lankan T-shirt industry.

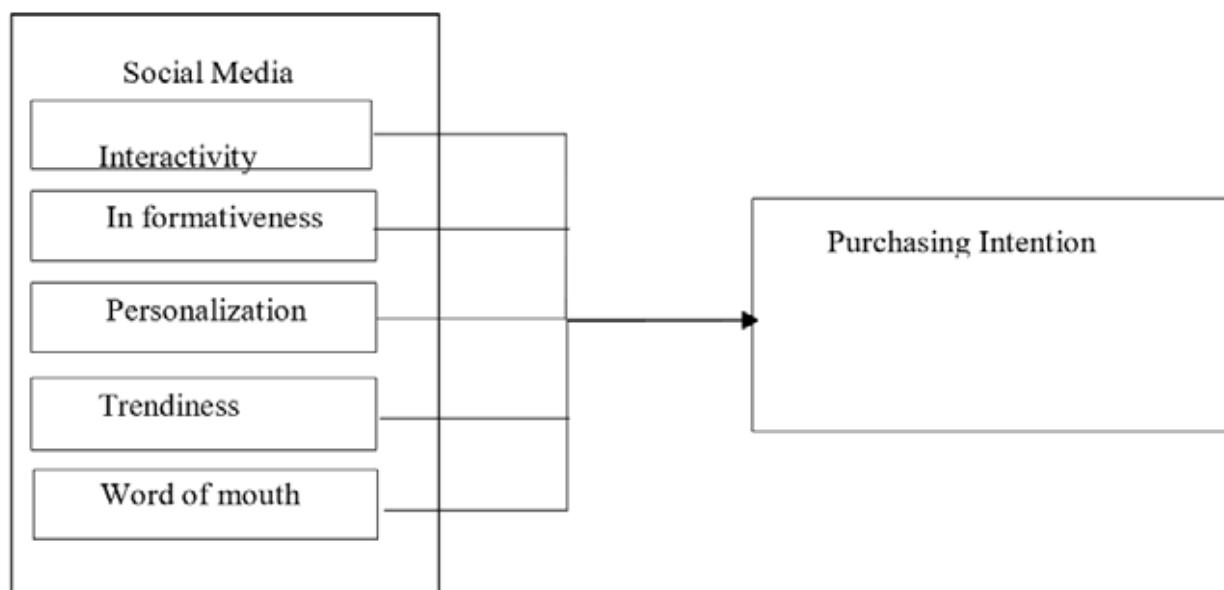
### Research Questions:

What is the relationship between social media marketing factors (Interactivity, Informativeness, Personalization, Trendiness, and Word of Mouth) and the purchasing intention observed in the Sri Lankan T-shirt industry?

To what degree do social media marketing factors (Interactivity, Informativeness, Personalization, Trendiness, and Word of Mouth) impact purchasing intention within the Sri Lankan T-shirt industry? Among the various dimensions of social media marketing, which one exerts the most significant influence on purchasing intention in the Sri Lankan T-shirt industry?

### Conceptual Framework

The conceptual framework (Figure 1 illustrates the proposed relationship between the variables under examination in the research study. Specifically, it suggests that Social Media Marketing influences purchasing intention.



### Hypotheses of the study

The study's hypotheses were formulated based on the literature review and the theoretical framework within the Sri Lankan apparel industry context. Two main objectives guided the development of these hypotheses:

Alternative Hypothesis (H1): There is a significant relationship between social media marketing activities and purchasing intention in the T-shirt industry in Sri Lanka.

Alternative Hypothesis (H2): There is a significant impact of Social Media Marketing (Interactivity, Informativeness, Personalisation, Trendiness, and Word of Mouth) on purchasing intention in the T-shirt industry in Sri Lanka.

## 3. Literature Review

Consumer behaviour has been significantly transformed by the rapid evolution of digital marketing in contemporary times. This transformation is primarily driven by technological advancements and the shift to an information-based digital economy (Bhatia, 2017). This evolutionary process encompasses a diverse range of electronic media, such as the Internet, email, interactive TV, and wireless platforms, which are effectively utilised in conjunction with digital customer data for marketing objectives. The



scope of digital marketing has transcended online advertising and now encompasses a wide range of communication methods, both online and offline. The evolution of this phenomenon has closely paralleled the advancement of the Internet, spanning from Web 1.0 to Web 3.0 (Ryan, 2014).

The primary digital marketing channels and strategies include a range of techniques, including search engine optimisation (SEO), search engine marketing (SEM), content marketing, social media marketing (SMM), email marketing, online advertising, affiliate marketing, mobile marketing, viral marketing, guerrilla marketing, and influencer marketing (Stokes, 2013). These strategies address various facets of online engagement and customer interaction.

Digital marketing is widely recognised as a crucial aspect of contemporary business environments, wherein the principal obstacle lies in formulating, adjusting, and sustaining efficacious strategies (HubSpot, 2018). Businesses must maintain competitiveness by staying abreast of the most recent trends and technologies in digital marketing (Kingsnorth, 2016).

Social media, an integral element of the digital environment, presents a challenge in providing a precise and universally accepted definition, resulting in diverse interpretations. The term “social media” refers to digital platforms, including internet and mobile applications, that enable users to engage with one another (Kaplan & Haenlein, 2010). It encompasses activities such as creating, distributing, and consuming online information about products, companies, and various topics by users (Blackshaw, 2004). According to Nair (2011), social media facilitates the digital dissemination of various forms of content, viewpoints, concepts, and interactions between commercial entities and their customers. According to Hoffman et al. (2013), it pertains to using web and mobile applications by individuals to generate, access, and interact with various forms of information.

A comparison between social media and traditional media highlights the benefits of social networks, such as the provision of real-time updates, the ability to engage in unlimited commentary, the immediate reception of feedback, and the availability of easily accessible archives (Stokes, 2013). Using social media platforms fosters user interaction and engagement, rendering it a valuable tool for businesses to collect feedback, comprehend customer requirements, and enhance their offerings (Hsu et al., 2013).

Social media encompasses a range of distinct categories, including Social Networking Sites (SNS), Content Communities, Company-Sponsored Blogs, Forums, Business Networking Sites, Personal Blogs, Microblogs, Collaborative Websites (Wiki), Social Bookmarking Sites, Open-Source Software Communities, Virtual Worlds and Games. According to Stokes (2013), these categories present a wide range of user engagement and interaction possibilities.

Social media platforms function according to seven distinct functionality categories: Identity, Conversation, Sharing, Presence, Relationships, Reputation, and Groups. The aforementioned elements are of utmost importance in influencing an organisation’s marketing strategy (Kietzmann et al., 2011). How individuals present themselves on social media platforms plays a significant role in shaping their identity, encompassing a wide range of user information. Conversations encompass engagements between users instigated by both individuals and businesses. The speed and extent of content exchange are influenced by sharing, whereas the concept of Presence facilitates access to different social networks. Relationships are expressed through establishing connections among individuals, intricately linked to their sense of identity. The concept of reputation pertains to how users portray themselves, while groups serve as the fundamental building blocks of social media communities.

The 6C model of social media engagement, as proposed by Parent et al. (2011), delineates the strategies companies employ to encourage consumer involvement, promote content dissemination and foster interaction within social media communities. The model emphasises bidirectional communication, wherein substantial discussions evidence consumer engagement.

The usage of social networks has experienced a significant increase, as evidenced by Facebook's reported 2.7 billion monthly active users as of October 2020, positioning it as the leading social network globally (Statista, 2020d).

The impact of social media is extensive, as it facilitates the creation of content, effective management of customer service, and increased appeal for businesses. These strategies can also influence the purchase intentions of customers (Chen et al., 2011; Ang, 2011; Lu et al., 2010; Aksoy et al., 2013). Incorporating social media platforms for online marketing, commonly known as social media marketing, is pivotal in contemporary business strategies. The process entails utilising social media platforms to promote a company and its products (Akar & Topcu, 2011). Additionally, it involves increasing brand recognition by employing principles of word-of-mouth marketing (Drury, 2008), and managing the company's image, reputation, and relationships with stakeholders (Parveen et al., 2016). According to Parveen, Jaafar, and Ainin (2016), social media platforms provide a means for companies to engage in interactive communication with the market, thereby allowing them to obtain valuable information regarding customer preferences and enabling prompt responses.

The advent of digital and social media has significantly impacted marketing, consumer behaviour, and e-commerce (Shin et al., 2015). According to Schultz and Kitchen (2004), corporate communication has transformed from conventional unidirectional communication to dynamic, interactive dialogues in real-time. Social media marketing encompasses integrating social media platforms with traditional communication channels, facilitating multifaceted interactive engagements among brands, consumers, and users (Sharma & Verma, 2018).

According to Herold (2017), empirical data reveals that social media marketing has yielded favourable outcomes for companies, as evidenced by most social media marketers (52%) reporting enhanced company performance and increased revenue. According to Herold (2017), widely utilised platforms for social media marketing encompass Facebook, LinkedIn, YouTube, Twitter, and Instagram.

The prevalence of social media marketing is emphasised by its extensive utilisation, especially among younger age groups (Pick, 2016). Nevertheless, obstacles still need to be addressed, as some organisations may not effectively utilise the capabilities of social media platforms (Grillo, 2017). According to Shin et al. (2011), empirical evidence indicates that many businesses predominantly employ social media platforms to disseminate information rather than foster interactive engagement. Despite the significance of social media spending, a considerable number of companies exhibit uncertainty regarding their allocation of resources in this domain, as evidenced by a study conducted by Moorman (2016), which found that 41% of companies lack clarity regarding their social media expenditures.

Social media marketing has brought about a significant transformation in communication, leading to the emergence of online social networks and positively influencing the emotional well-being of users (Thoren et al., 2013; Nabi et al., 2013). According to Hair, Clark, and Shapiro (2010), individuals utilise social media to disseminate ideas and facilitate the exchange of information, rendering it a suitable platform for advertisers to interact with their target audience. Consumers actively pursue product information and reviews through social networks, where electronic word-of-mouth (WOM) holds significant sway in shaping their purchasing decisions (Akar & Topçu, 2011; Clemons, 2009). According to Shiau and Luo (2013), blogs and user reviews are crucial in influencing consumers' purchasing decisions, thereby holding considerable importance for users.

According to Weinberg (2009), social media marketing provides companies with the opportunity to advertise their products and services online, interact with customers, and obtain valuable feedback, a capability that is not typically available through conventional advertising methods. According to Roberts and Kraynak (2008), individuals who engage on social networks assume the role of influencers, capable of moulding a company's values and principles. According to Marken (2007),

this particular strategy has resulted in a shift where the intended recipients of advertising messages have become active promoters, decreasing the time it takes to receive responses. The utilisation of social media has emerged as a pivotal instrument in marketing, exerting a significant impact on the purchasing decisions of online consumers (Miller & Lammas, 2010).

## **4. Methodology**

### *4.1. Study Design*

A positivist research philosophy informs the study's research strategy and utilizes a quantitative methodology. The selected methodology adheres to a well-defined hypothetical-deductive framework, encompassing eight essential elements as delineated by Sekaran (2003). The study begins by analyzing the research situation without employing observation as a formal research approach. Subsequently, a comprehensive examination of the existing literature is undertaken in order to collect prior study findings, ascertain any existing gaps in knowledge, and substantiate the importance of the variables under investigation. The purpose of this literature review is to establish the basis for developing a questionnaire that is in line with the study's objectives. The enhancement of conceptual clarity is facilitated by establishing theoretical frameworks, enabling a more profound comprehension of the research topics at hand. Various hypotheses are developed in order to examine and evaluate these theoretical constructions.

### *4.2. Data Collection Design:*

The study focused on individuals in the Colombo District engaged in online T-shirt purchases, as indicated by data from the Sunday Observer (2021). In January 2022, the social media user base in Sri Lanka reached 7.20 million individuals, comprising an impressive 32.9% of the entire population. Considering the metropolitan nature of Colombo, with widespread access to network and Wi-Fi facilities across all generations, the total population in the district was estimated at 620,000. Assuming all of them use social media for purchasing, the study's effective population was set at 620,000, and the estimated proportion ( $p$ ) was conservatively set to 0.5 to account for maximum variability. Utilizing a 95% confidence level (approximated as 1.96) and a margin of error ( $E$ ) of 0.05 (5%), the calculated sample size was determined to be 384.

Given the absence of a formal sampling frame due to the unique characteristics of the population, a combination of convenience sampling methods particularly Snowball Sampling, was employed for participant selection. Cluster sampling was chosen to ensure a diverse range of responses from various social media user types. Rigorous criteria were set for participant selection, requiring regular social media usage, previous engagement in e-commerce transactions, and involvement in product-related activities (Yadav & Rahman, 2017). This method was chosen to obtain a representative sample from the target audience and bolster the study's validity and reliability. Initially, 1,000 potential sample units were approached, but the initial response rate was disappointingly low, below 10%. To overcome this challenge and enhance data collection, Snowball Sampling, with a typical response rate range of 5% to 30% according to an online survey in 2022, was adopted, resulting in data collection from 243 respondents. The sample units were defined based on specific criteria: individuals who regularly used social media, engaged in e-commerce purchases, provided product ratings and reviews, and consulted such reviews in their purchase decisions, ensuring the selection of participants actively involved in both social media and e-commerce activities. The study conducted by Wu et al. (2022) employed a meta-analytic approach to investigate the response rates of online surveys, particularly online survey methods. The analysis encompassed a total of 1071 reported online survey response

rates, yielding an average rate of 44.1%. Given the aforementioned circumstances, we distributed our survey with the anticipation of attaining a minimum response rate of 40%. Nevertheless, the difficulties associated with accurately address to sample units have had a negative impact on the rate of response in online surveys.

Data collection predominantly relied on survey research, involving the distribution of self-administered questionnaires electronically through social media platforms. The questionnaire design followed principles outlined by Sekaran (2005) concerning wording, measurement, and the questionnaire's general appearance, meticulously structured into four sections. The first section focused on demographic variables and employed a categorical scale, offering predefined categories for participant selection. The second section aimed to gauge participants' opinions on their involvement in social media marketing activities, employing a 5-point Likert-type scale without reverse-scored statements. The third section of the study, which is based on the work of Yadav and Rahman (2017), evaluates the variable of Social Media Marketing. This evaluation is conducted using a Likert scale that spans from 1 to 5, with 1 representing a strong disagreement and 5 representing a strong agreement. The fourth section of the study examines the dependent variable, purchasing intention. This variable is measured using seven items that were developed based on the construct proposed by McKnight et al. in 2002. The questionnaire's structure incorporates established frameworks and scales utilized in prior research, thereby offering a comprehensive methodology for examining the correlation between social media marketing, purchasing intention, and pertinent demographic variables. The chosen methodology guarantees the study's relevance, reliability, and comparability to previous literature, thereby strengthening the study's robustness.

A preliminary investigation involved 20 users of social media platforms in the Colombo District, evaluating the questionnaire's wording, sequencing, and layout. It also assessed respondents' familiarity, response rate, and completion time. After a pilot study, slight modifications were made to enhance questionnaire efficacy. Confirmatory factor analysis, reliability, and validity testing were conducted on the collected data, surpassing the recommended alpha level of 0.70 (Nunnally, 1978).

#### *4.3. Data Analysis Design:*

**Sample Survey and Results:** The data analysis process included a sample survey, where responses from the 243 participants in the Colombo District were collected and processed. Descriptive statistics were used to summarize the characteristics of the sample, while inferential statistics were employed to test hypotheses and derive meaningful conclusions.

**Application of Statistical Tools:** To measure the impact of social media marketing activities on purchasing intention, multiple regression analysis was conducted. The Statistical Package for Social Sciences (SPSS) and Microsoft Excel were utilized as tools for data analysis, providing a robust platform for analyzing the data effectively and efficiently.

**Pre-Assumption Testing:** Assumptions for multiple regression, such as linearity, multicollinearity, homoscedasticity, and normality of residuals, were tested and addressed as necessary to ensure the reliability and validity of the analysis results. This rigorous approach to data analysis was crucial in deriving meaningful insights from the collected data.

#### *4.4. Data Analysis and Discussion*

This study gathered 243 valid responses from individuals who use Social Media and implemented thorough data cleansing protocols to ensure the accuracy and reliability of the data. Outliers were detected through plot diagrams and graphs, excluding 11 cases determined to be outliers. This process resulted in a remaining sample size of 351 questionnaires, which were subsequently subjected to further analysis. In order to handle the occurrence of random missing values, a mean replacement



technique was utilised, whereby the missing responses were substituted with the average value of the corresponding variable. Boxplot diagrams were employed to verify the integrity of the data, thereby confirming that there were no unaddressed missing values. Furthermore, a small number of outliers were identified, and it was determined that these outliers were isolated instances rather than widespread anomalies throughout the entire dataset. The data-cleaning procedure followed established protocols and statistical assumptions, considering the presence of outliers in the population (Tabachnick & Fidell, 2007).

The research collected data from a sample of 351 individuals who actively use social media platforms in the Colombo District of Sri Lanka, with the primary objective of examining their demographic characteristics. The majority of male respondents accounted for 51.8% of the total sample. The age group of 21-25 years was the most prevalent among the participants, comprising 38.7% of the total sample. Regarding educational attainment, it is noteworthy that a significant proportion of participants, specifically 63%, possessed high school diplomas or degrees. This finding suggests a relatively elevated level of education within the sample. Regarding occupation, the largest proportion of individuals belonged to the private sector category, accounting for 41.7%. This was followed by students, comprising 25% of the population. A notable portion of individuals (35.4%) earned less than Rs 40,000, whereas a majority (over 42%) fell within the income bracket of Rs 40,001 to Rs 120,000.

The investigation additionally evaluated the dependability of its measurement scales by employing Cronbach's Alpha coefficients, a statistical measure that assesses internal consistency. All constructs, such as informativeness, trendiness, interactivity, personalisation, word-of-mouth (WOM), and purchasing intention, demonstrated Cronbach's Alpha values that surpassed the threshold of 0.7, indicating satisfactory internal consistency.

The constructs under investigation were assessed using a set of items. The number of items included in the assessment varied depending on the specific construct. The reliability of the measurement was evaluated using Cronbach's alpha coefficient.

The text assigns ratings to different parameters related to the study. In this context, the level of informativeness is rated at 3, with a corresponding score of 0.718. The parameter "trendiness" is also rated 3, with a confidence level of 0.720. Similarly, the level of interactivity in the provided context is rated as 3, with a corresponding value of 0.741. The concept of personalisation, widely recognised as an essential aspect across various fields, pertains to tailoring or customising a product or service. The Women's Olympic Marathon (WOM) achieved a completion rate of 75%, with 3 out of 4 participants successfully finishing the race.

The purchasing intention of the individual is rated at 7, indicating a relatively high level of intention to make a purchase. The correlation coefficient 0.730 suggests a strong positive relationship between the individual's intention.

The results from the reliability test confirm the strength and consistency of the measurement scales employed in the study, ensuring that the items accurately and effectively represent their respective constructs.

The research utilised various statistical analyses to establish the gathered data's credibility and consistency. Initially, the researchers conducted the Kaiser-Meyer-Olkin (KMO) measures and Bartlett's test in order to evaluate the adequacy of the sampling and the sphericity. Kaiser-Meyer-Olkin (KMO) values greater than 0.7 were obtained for the dependent and independent variables, indicating satisfactory sampling adequacy. Additionally, the significance values, which were lower than 0.05, provide further evidence supporting the validity of the study sample.

Descriptive statistics were computed to analyse the distribution characteristics of the data, encompassing measures such as the mean, standard deviation, skewness, and kurtosis. All constructs

demonstrated standard deviations that fell within the range of -2 to +2, suggesting an acceptable level of variability for subsequent statistical analyses. The skewness and kurtosis values, which evaluate the symmetry and peakedness of the distribution, were found to be within acceptable thresholds.

The evaluation of multivariate assumptions encompassed the examination of normality and linearity. The validation of normality assumptions was conducted by analysing symmetry, skewness, and kurtosis, which indicated that the data closely approximated normal distributions. The confirmation of linearity between the dependent and independent variables was achieved through scatter plots and correlation analysis. The intercorrelations among the independent variables revealed that all correlations were below 0.9, suggesting the absence of multicollinearity concerns.

The study employed correlation analyses to assess the associations between the independent variables, namely Informativeness, Trendiness, Interactivity, Personalization, and WOM, and the dependent variable, Purchasing Intention. Significant statistical correlations ( $p < 0.001$ ) were observed between each independent variable and Purchasing Intention, albeit with weak positive associations. The variables of Informativeness, Trendiness, Interactivity, Personalization, and Word-of-Mouth (WOM) exhibited correlations of 0.389, 0.314, 0.315, 0.389, and 0.366, respectively, with Purchasing Intention.

The obtained correlation results demonstrate a positive association between each dimension of social media marketing: Informativeness, Trendiness, Interactivity, Personalization, and WOM, and consumers' Purchasing Intention. These findings support the study's primary objective of investigating the relationships between these variables.

In general, the statistical analyses conducted in this study confirm the data's quality and support the hypotheses and research objectives. This, in turn, enhances the strength and reliability of the research findings.

Within this section, a linear regression analysis was undertaken to examine the influence of several independent variables (namely, Informativeness, Trendiness, Interactivity, Personalization, and WOM) on the dependent variable, Purchasing Intention. The findings of these analyses are succinctly outlined in the following section.

The results of the regression analysis indicate that there is a statistically significant relationship between informativeness and purchasing intention. The coefficient of determination, denoted as R-squared, was 0.120. This value suggests that the variable Informativeness can account for around 12% of the variability observed in Purchasing Intention. The coefficient representing the degree of informativeness ( $B = 0.217$ ) exhibited statistical significance, as indicated by a p-value of less than 0.001. Consequently, the hypothesis (H1) positing a substantial correlation between Informativeness and Purchasing Intention was deemed valid.

The influence of trendiness on purchasing intention was also statistically significant. The coefficient of determination (R-squared) was found to be 0.099, suggesting that the variable Trendiness can account for approximately 9% of the variability in Purchasing Intention. The statistical analysis revealed that the coefficient for Trendiness ( $B = 0.203$ ) exhibited a significant relationship with the dependent variable, as indicated by a p-value of less than 0.001. Therefore, the hypothesis (H2) positing a substantial association between Trendiness and Purchasing Intention was deemed valid.

The study revealed that interactivity had a notable influence on purchasing intention. The coefficient of determination (R-squared) was found to be 0.099, suggesting that around 9.9% of the variability in Purchasing Intention could be accounted for by Interactivity. The statistical analysis revealed that the coefficient for Interactivity ( $B = 0.201$ ) exhibited a significant relationship, as indicated by a p-value of less than 0.001. Consequently, the hypothesis (H3) positing a substantial correlation between Interactivity and Purchasing Intention was deemed valid.



The influence of personalisation on purchasing intention was found to be statistically significant. The coefficient of determination (R-squared) was calculated to be 0.151, suggesting that around 15.1% of the variability in Purchasing Intention can be accounted for by the influence of Personalization. The statistical analysis revealed that the coefficient for Personalization ( $B = 0.249$ ) exhibited a significant relationship, as indicated by a p-value of less than 0.001. Therefore, the hypothesis (H4) positing a substantial correlation between Personalization and Purchasing Intention was deemed valid.

The Impact of Word of Mouth (WOM) on Consumer Purchase Intention: The analysis findings indicated a noteworthy influence of word-of-mouth (WOM) on individuals' intention to purchase. The coefficient of determination, denoted as R-squared, was calculated to be 0.134. This value suggests that around 13.4% of the variability in Purchasing Intention can be accounted for by Word-of-Mouth (WOM). The coefficient for WOM ( $B = 0.212$ ) exhibited statistical significance ( $p < 0.001$ ). Consequently, the hypothesis (H5) positing a substantial association between word-of-mouth (WOM) and purchasing intention has been supported.

The present study examined the influence of Social Media Marketing, encompassing factors such as Informativeness, Trendiness, Interactivity, Personalization, and Word-of-Mouth (WOM), on individuals' Purchasing Intention. The model, when combined, accounted for 19.8% of the variability observed in Purchasing Intention. The statistical significance of the coefficients for all components of Social Media Marketing was observed ( $p < 0.001$ ). Therefore, the hypothesis (H6) positing a substantial correlation between Social Media Marketing and Purchasing Intention was deemed valid. The present study analysed multicollinearity to evaluate the degree of correlation among the independent variables. All tolerance values exceeded 0.02, and all Variance Inflation Factors (VIF) were below 5, suggesting the absence of multicollinearity concerns within the model.

The regression analysis conducted on the different dimensions of Social Media Marketing (SMM) and their impact on Purchasing Intention provides valuable findings regarding the effects of these factors on consumer behavior. The impact of various dimensions, such as Informativeness, Trendiness, Interactivity, Personalization, and Word-of-Mouth (WOM), on consumers' purchase intentions is significant.

The coefficient of Informativeness ( $\beta = 0.347$ ) demonstrates a positive relationship between the level of informative content in social media marketing and Purchasing Intention, suggesting that an increase in informative content leads to a significant positive impact on the likelihood of making a purchase. Consumers exhibit a higher propensity to engage in purchasing behavior when they encounter product or service information that is both comprehensive and valuable.

The concept of trendiness refers to the state or quality of being fashionable or popular within a particular period of time. The variable of trendiness demonstrates a statistically significant positive effect ( $\beta = 0.314$ ) on the intention to make a purchase. This implies that individuals are susceptible to the impact of prevailing trends disseminated via social media marketing. The implementation of a strategy that is in line with prevailing trends can greatly increase the probability of consumers engaging in a purchase. The dimension of Interconnectivity exhibits a significant positive impact ( $\beta = 0.315$ ) on Purchasing Intention. This highlights the significance of cohesive and interconnected experiences across diverse social media platforms in influencing consumer behavior. The presence of a positive coefficient ( $\beta = 0.389$ ) in the context of Personalization suggests that customizing content and experiences based on individual preferences has a favorable impact on the intention to make a purchase. The implementation of a tailored strategy in social media marketing plays a substantial role in influencing consumer decision-making processes. The influence of Word-of-Mouth on Purchasing Intention is substantiated by empirical evidence, demonstrating a significant positive effect ( $\beta = 0.386$ ). The purchasing decisions of consumers are significantly impacted by the opinions and recommendations of others, highlighting the influential role of social interactions in this process.

In general, social media marketing encompasses various strategies and techniques employed by businesses to promote their products or services through online platforms. The overall impact of all dimensions encompassed by Social Media Marketing is significant ( $\beta = 0.445$ ). This finding supports the notion that a comprehensive and efficient social media marketing approach, encompassing multiple facets, has a substantial impact on and can serve as a predictor of consumers' purchase intentions.

**Table: Summary of Regression Results for Independent Variables on Purchasing Intention**

Independent Variable	Multiple R	R Square	Adjusted R Square	Standard Error	t-statistic	F	Sig.
Informativeness	0.347	0.120	0.117	0.41460	5.612	31.495	0.000
Trendiness	0.314	0.099	0.955	0.41992	5.016	25.1560	0.000
Interconnectivity	0.315	0.099	0.905	0.41961	5.028	252.80	0.000
Personalization	0.389	0.151	0.145	0.40723	6.407	41.047	0.000
WOM	0.386	0.134	0.130	0.41146	5.958	35.503	0.000
Social Media Mktg	0.445	0.198	0.193	0.39597	7.528		

The regression analysis reveals that the R-squared values are low, indicating the complex relationship between social media marketing and its influence on purchasing intention. The dimensions that have been chosen, namely Informativeness, Trendiness, Interactivity, Personalization, and WOM, are important but may not fully encompass the wide range of factors that impact consumer decisions in this complex and ever-changing field. The study acknowledges that there are external variables, such as economic conditions, cultural influences, and competitive factors, which were not within the scope of the study but could have a significant impact on purchasing intention in Sri Lanka's current economic crises.

The intricate nature of social media marketing implies that the involvement of interactions and moderators assumes a crucial significance. The efficacy of personalization, for instance, may depend on variables such as the nature of the product and the demographic characteristics of the target audience. The omission of these interaction terms may potentially contribute to the observed low R-squared values. Moreover, the intrinsic variability in consumer behavior, which is influenced by a multitude of factors, presents difficulties in accurately predicting and comprehensively explaining purchasing intention.

Acknowledging the multi-stage nature of the purchasing intention decision-making process, the study acknowledges that the dimensions selected primarily pertain to the stages of awareness and interest. The current model may not fully incorporate factors that hold greater significance in later stages, such as consideration and purchase.

In summary, the relatively low R-squared values indicate constraints in the current model's ability to explain the observed data, but they also indicate potential for additional investigation. Future research endeavors should aim to broaden the range of variables under investigation, enhance the precision of measurement instruments, and adopt a comprehensive perspective on consumer behavior within the realm of social media marketing. This methodology will facilitate a more nuanced and comprehensive examination of the complex dynamics that impact consumer purchasing intentions.

## **5. Conclusion**

In conclusion, this research examined the correlation between social media marketing endeavours and the intention to purchase within the T-shirt sector in Sri Lanka. The study results indicate that engaging in social media marketing activities favours consumers' intention to make a purchase. Although the overall impact was substantial, it only explained a proportion of less than 20% of the variability observed in purchasing intention. The dimension of social media marketing identified as having the most significant impact on purchasing intention is Word of Mouth. This implies that the utilisation of social media marketing can serve as a viable strategy for businesses operating in the T-shirt industry to engage potential customers and stimulate their inclination to make purchases, although it should be noted that it is not the exclusive factor influencing consumer behaviour.

This study has two main implications. First and foremost, it highlights the significance of integrating social media marketing initiatives into the marketing tactics of enterprises operating in the T-shirt sector within Sri Lanka. Although social media marketing may not be the exclusive determinant of purchasing intention, it nevertheless holds considerable influence. It can serve as a cost-efficient strategy for attracting and retaining customers.

Additionally, the research emphasises that businesses must consider other factors impacting consumers' purchase intention. In order to optimise customer conversion, it is imperative to prioritise factors such as customer trust and website security within a comprehensive marketing strategy.

Some certain constraints or restrictions need to be acknowledged and considered in this study.

It is essential to acknowledge the presence of various limitations in this study. The sample size used in this study was relatively limited, potentially limiting its ability to comprehensively capture the diverse characteristics of the T-shirt industry in Sri Lanka. The scope of data collection was limited to the Colombo District, thereby constraining the extent to which the findings can be generalised to other geographical areas. The utilisation of convenience sampling resulted in the possibility of selection bias. Furthermore, it is important to note that the study assumed the stability of various other factors that could impact purchasing intention. However, considering that this assumption may not necessarily align with real-world conditions is worth considering.

Implications:

The study underscores the critical importance of integrating social media marketing into the overarching strategies of T-shirt businesses operating in Sri Lanka. Recognizing social media marketing as a cost-effective avenue for both attracting and retaining customers, the study advises businesses to allocate resources towards building a strong online presence. This involves leveraging popular platforms such as WhatsApp, Facebook, YouTube, and Instagram. Notably, the study identifies Word of Mouth (WOM) as the most impactful dimension, emphasizing the influential role of social interactions and recommendations in shaping consumer decision-making. To capitalize on this, businesses are encouraged to actively foster positive WOM through customer reviews and social media engagement.

Furthermore, the study underscores the need for businesses to consider a spectrum of factors within comprehensive marketing strategies, highlighting the pivotal roles of trust and website security. While social media is a potent tool, it is essential to recognize that consumer purchasing intention is influenced by a multifaceted set of factors. The study acknowledges the necessity for future research to delve into external variables, including economic conditions, cultural influences, and competitive dynamics, to provide a more nuanced understanding.

Despite these insights, the study acknowledges its limitations, including a relatively small sample size, geographical constraints, and the potential for selection bias resulting from convenience sampling. To address these limitations and enhance the applicability of findings, the study advocates for future research with larger and more diverse samples. Additionally, the study recognizes its focus on the

awareness and interest stages of the purchasing intention decision-making process. It suggests that future research should encompass consideration and purchase stages to offer a more comprehensive understanding of consumer behavior.

In conclusion, the study encourages businesses to adapt continuously in response to evolving trends, consumer preferences, and technological advancements in the dynamic landscape of social media marketing. By heeding these recommendations, T-shirt businesses in Sri Lanka can optimize their strategies, leveraging social media as a potent tool within a broader marketing framework.

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UDC 338.48:78(497.5)

Original Scientific Paper

<https://doi.org/10.2507/IJVA.9.2.2.103>



Received: November 16, 2023

Accepted for publishing: December 18, 2023

## CONCEPTS FOR INTEGRATING MUSIC AND MUSICAL TOURISM IN DESTINATION GROWTH

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### **Abstract:**

**Purpose** – The aim of the research is to analyse the possibilities of implementing music and music tourism in innovative tourism offers and promotions, based on the results and systematic analysis of existing literature with specific application in the repositioning of Croatian tourism.

**Research Design** – The conceptual research provides a comprehensive insight into the way music is used in destination development. It focuses on various examples of the implementation of music tourism.

**Methodology** – The research includes a bibliographic analysis using the Bibliometrix software package via the Scopus and WoS databases, which were selected to provide an overview of previous research on the concept of using music in destination development and to develop recommendations for implementation.

**Results** – The results enable the identification of key determinants and concepts of musical offerings and promotions in Croatian tourism based on a systematic literature review and the specifics of Croatian tourism development at all levels.

**Research Originality** – The application of music in tourism, music management in tourism – audio management, represents an under-researched area of scientific and professional research and concrete applications in global and Croatian tourism. The paper offers concrete proposals and research based on key research concepts. On an applied level, this requires a complete re-evaluation of how destination tourism incorporates musical offerings into its development system.

**Keywords:** *Musical tourism, Tourist destination, Destination offering and promotion, Systematic literature review*

## 1. Introduction

Music and sound are becoming increasingly crucial elements of modern tourism, especially in the context in which music tourism is gaining in importance as a more attractive and stimulating form of tourism. Music and sounds can evolve into tourism visit motives based on musical events (Ballantyne et al., 2014; Borges et al., 2020; Hutabarat, 2022) and the development of museums, galleries and other facilities that represent the cultural-musical offer of a destination. Alternatively,



they can become essential components of an integrated product based on audio design that creates a unique experience for tourists (Liberato et al., 2019).

Music can evoke the past through the valorisation of traditional music as an element of cultural heritage (Long et al., 2014; Youngmi and Meng, 2020; Georgiou, 2023). It can offer an experience of the present (musical trends, forms and types of music) or a hope for the future (possibilities of digitalisation of music, use of artificial intelligence in audio design). Music plays an increasingly important role in the innovation of offers and the creation of advertising measures based on a musical logo or brand (music as a connection and symbol for a destination, digital advertising, social networks, especially TikTok) (Hultén et al., 2009).

Within the concept of destination development and defining the future based on the analysis of the current state and future trends, a crucial challenge is to transform the music and sound resource (enhancing positive impacts and eliminating negative impacts – noise) into a highly competitive tourism product and music experience (adapted to tourists and the local population) and a recognisable music market brand. Audio management plays a crucial role in the creation of music offers and promotions to achieve a unique experience and new tourism experiences of the destination. It is part of the process of redefining offers and promotions based on sustainable development and local values in order to increase consumption and profit growth (Grgurić, Stipanović, 2022:7). Music and sound take on the role of enhancing emotional experiences and at the same time representing the destination in the increasingly used forms of sound brands as a kind of audio identity (Fahey, 2014).

## **2. The role of music and sound in tourism**

Music tourism is a subset of cultural tourism and is a specific niche in which the valorisation of music is a dominant element in the development of destinations. It varies in the profiling of music events and festivals and in the development of music offerings based on museums, theatres and music institutions. Music tourism has several subtypes, with festival tourism being crucial for the profiling of increasingly attractive music festivals (Amorim et al., 2020). Music events and festivals are aimed at both domestic and foreign tourists as well as the local population (DuPreez and Kruger, 2022). These events have the potential to enhance local culture and traditional values (Novello and Fernandez, 2016). Music events must appeal to the younger population and include both contemporary and traditional music to fulfil spiritual, sensory, social, intellectual and emotional values (Buljubašić, 2020:9).

Tourist offers associated with musical experiences involve the development of a destination with music as one of its dominant symbolic and/or semantic values (Gortan-Carlin, 2014). A prerequisite is raising awareness of the potential of music to minimise negative and emphasise positive impacts on the tourism offer and promotion.

Trompeta et al. (2022), Bustomi and Avianto (2022), Min et al. (2020), Han et al. (2017) list positive and negative impacts of music on destination tourism, including:

Examples of negative impacts of music and sound in tourism:

- Saturation of sound sources (musical and non-musical) on land and at sea
- Noise and sound pollution (construction noise, tourist events, etc.)
- Outdated technological solutions
- Standardized, uniform, non-creative offerings
- Insufficient stakeholder collaboration in creating musical content
- Music and sound as an undervalued resource

- Insufficient involvement of the local population in creating musical content
- Limitations and constraints on development to isolated entrepreneur and enthusiast content
- Lack of systematic and planned development of musical offerings and promotion
- Insufficient integration of sound and music in the acoustic presentation of the destination

Examples of positive impacts of music and sound in tourism:

- Multifunctionality: entertainment, cultural function, music in wellness
- Music as a standalone offering – musical tourism (music festivals, museums)
- Music as an integral element of the comprehensive offering
- Creating a musical atmosphere in audio design and audio ecology
- Multiple applications: offering, promotion, and audio branding
- Valorization of tradition, authentic musical offerings, and identity
- Profitability
- High level of involvement of the local community
- Innovative offering element (e.g., Zadar's Sea Organ)
- Innovative promotion element (synergy of traditional and modern music in promotion)

Music and sound can evolve into the identity and most important connection of a destination. Examples include Salzburg and Vienna as destinations for classical music (Guachalla, 2023), Varaždin in Croatia as a destination for Baroque music (Maričić, 2016), Liverpool as a destination for pop and rock music, Ibiza in Spain and Zrće in Croatia as destinations for electronic music and Omiš in Croatia as a destination for Dalmatian klapa singing (Grgurić and Stipanović, 2021). Examples of global destinations for music and acoustic tourism include stone gongs (Tanzania), music streets (California), canal bridges (Dublin), the city of Elvis Presley's music (Tennessee), the city of experimental music (Berlin) and the Coachella festival (California). The trend towards music museums is increasingly present in tourism offerings, such as the John Lennon Museum in New York or the Beatles Museum in Liverpool.

The importance of music and sound in tourism is increasingly recognised in academic and professional thinking on destination development, and the following section analyses a systematic review of the literature on the use of sound and music in tourism development.

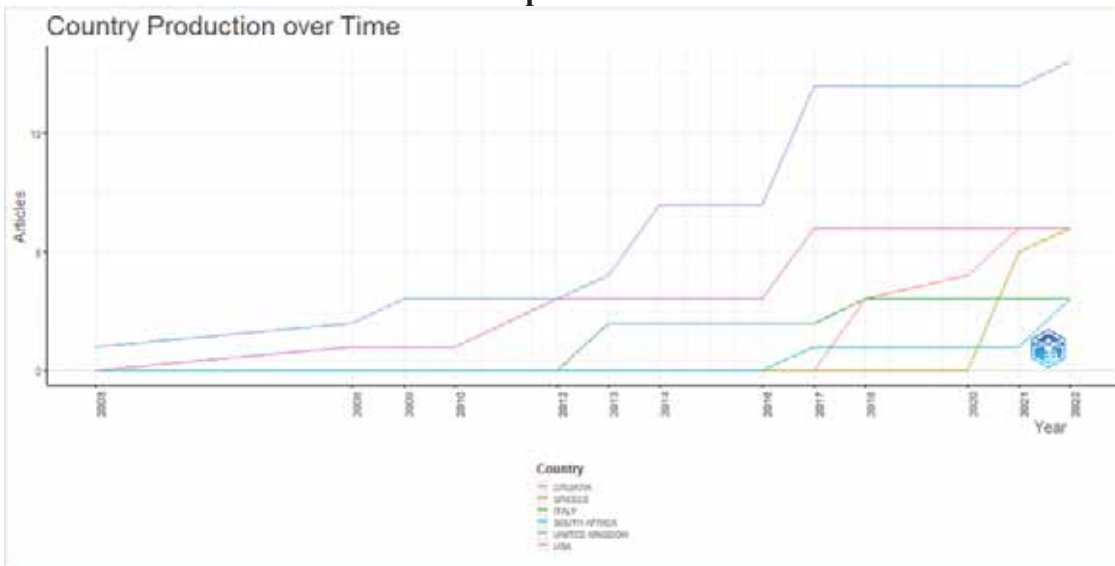
### **3. Music and sound in destination development - systematic literature review**

A systematic literature review was conducted to identify relevant research articles. The review focused on the significance of music and sound in tourism, and keywords such as *musical tourism offerings*, *music and sound in destination development*, *music and sound in tourism*, *music tourism soundscapes in tourism*, *destination soundscape*, *acoustic environments in tourist destinations*, *destination promotion through sounds*, were used to select papers. The review was based on the Scopus and Web of Science (WoS) databases, and the analysis included articles published in the last 5 years, from 2019 to 2023. Only articles in the field of economics were included in the final selection to ensure a targeted analysis of economic aspects related to music and sound in tourism. The final sample for the analysis comprised a total of 50 articles. The selected articles were thoroughly reviewed and the final sample consisted of 11 articles in academic journals, 3 articles in conference proceedings and 1 chapter in a book. The final selection involved reading the entire database, indicating a comprehensive approach to understanding the selected literature. The bibliometric analysis, a quantitative method for

analysing bibliographic data, was performed using the Bibliometrix software package. This analysis provides insights into patterns of authorship, collaboration and publication trends.

The results of the bibliometric analysis showed that, on average, each of the 106 authors had one publication on the topic. The co-authorship index was 2.1, indicating moderate collaboration. The annual average number of publications increased by 8.84 %, which indicates a growing interest in the topic. The proportion of international co-authorship was 9.66 %, which indicates a certain degree of international collaboration in research.

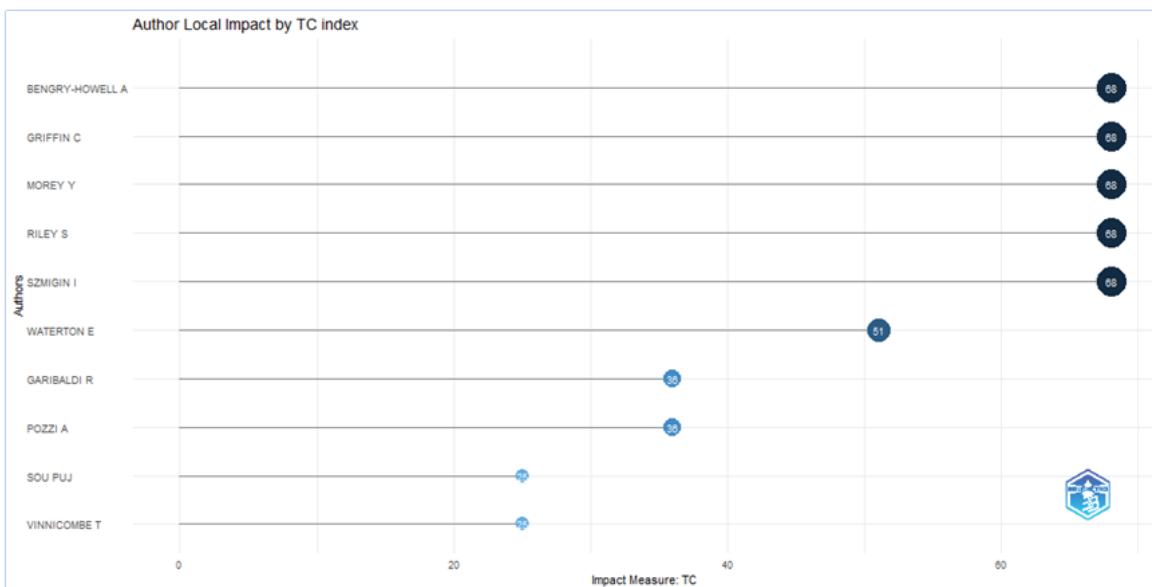
**Picture 1: Articles in the WoS and Scopus databases**



Source: Processed by the authors using the Bibliometrix software package

The highest number of published articles comes from authors in the United Kingdom, with 13 papers, and they have the highest citation rank. The majority of papers were published between 2020 and 2022, with an average citation rate of 9.9 times per paper.

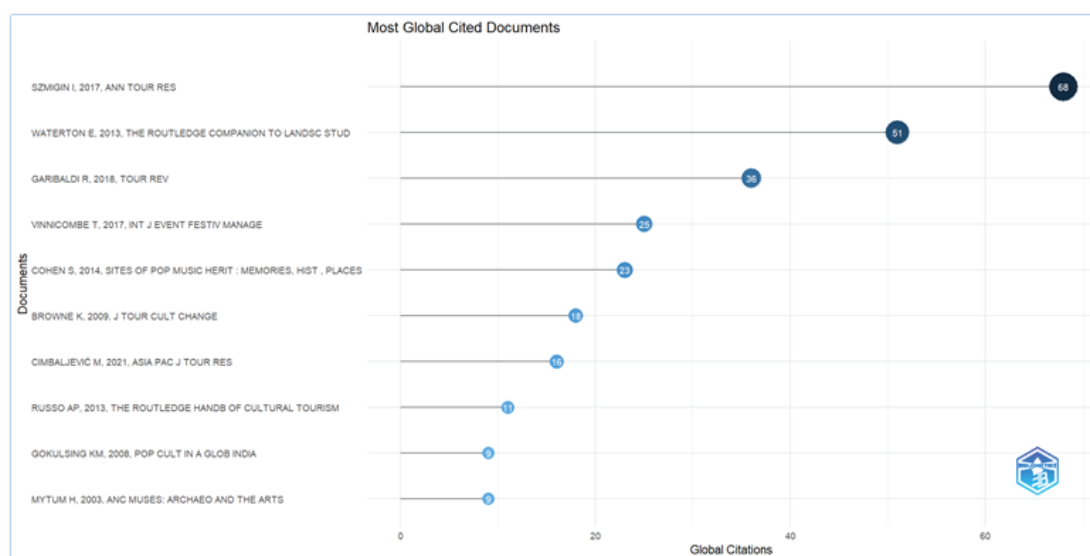
**Picture 2: Impact factor by authors.**



Source: Processed by the authors using the Bibliometrix software package

Bengry-Howell, A., Griffin, C., and Morey, Y. are the three most significant authors with the average number of citations per paper published in one year. The paper of author Bengry-Howell, A. explores the organization and management of music within music festivals that influence the creation of an authentic experience (Szmigin et al., 2017). Griffin (2018) investigates consumer culture at music festivals (Griffin et al., 2018), while Morey et al. (2014) also explore perspectives on significant transformations shaping music festivals.

Picture 3: List of papers by citation level



Source: Processed by the authors using the Bibliometrix software package.

The most cited article titled “Socio-spatial authenticity at co-created music festivals” in the journal *Annals of Tourism Research*, authored by Szmigin, I., Bengry-Howell, A., Morey, Y., Griffin, C., and Riley, S. in 2017, has 68 citations. In total, 5 papers have garnered more than 20 citations.

Picture 4: Word cloud



Source: Processed by the authors using the Bibliometrix software package.

The authors most frequently used the keywords festivals, music and tourism. Keywords such as sound, development of offers and promotions and music management were not found. The promotion of destinations based on music was rarely used in the WoS and Scopus databases. The search for keywords in the papers in the same period, promotion of music in tourism, promotion of music destinations and promotion of music tourism revealed 15 papers published in the last 5 years, from 2019 to 2023, including 13 scientific articles in journals and 2 papers in conference proceedings (two co-authored papers). A total of 33 authors, 30 from abroad and 3 from Germany, showed that most authors have published only one paper on the topic of music promotion in tourism. When summarising the offer and promotion of destinations based on music, authors mostly use concepts of creating tourism identity based on specific music genres. There are 156 publications in the WoS and Scopus databases, of which over 90% are empirical studies on destinations that have promoted themselves through music festivals and popular music.

Local traditional music and the promotion of traditional music in the development of destinations are represented in the WoS and Scopus databases in an extremely low proportion. Only 3 papers were found dealing with destination development based on traditional music with local identity, and all three papers are folk music centred.

The concept of managing destination development based on music is represented in a smaller number of papers. Only 6 papers were found to base their research on destination management based on music. Audio management as an overarching concept of managing offers and promotions in destination development as well as music in the strategic thinking of destinations was addressed by two co-authors, while other authors, 13 in total, used the concept of audio management in promoting a specific music genre as a motive for visiting the destination.

The quantitative indicators show that the importance of sound and music is being recognised in the design of tourism products and promotions, moving tourism from a visual experience to a multi-sensory experience that engages all the senses. Work focuses more on the creation of musical content and less on audio branding, and there is a lack of academic work based on the definition of audio management models for the systematic management of sound and music in the creation of music offers and promotions.

The results of the scientific literature need to be implemented in the development of Croatian tourism on the basis of a more active and systematic implementation of sound and music, taking into account the specifics of Croatian tourism (resource base, target segments, competitiveness, strategic development thinking).

#### **4. Applied examples of valorizing sound and music in croatian tourism**

The development of music tourism, musical offerings, and destination promotion must result from the strategic thinking of all destination stakeholders to systematically develop entrepreneurial initiatives in diversifying the offerings and musical identity, which will become predominant in destination selection (e.g., Ultra Split, evolving into a tourist synonym for the city of Split). Strategic thinking is based on the concept of development and the systematic implementation of audio management in the overall management model and continuous improvement for sustainable destination development. From the perspective of Croatian tourism development, the valorization of sound and music in offerings and promotions must align with achieving the strategic goals of the Sustainable Tourism Development Strategy until 2030<sup>1</sup> – strategic goal 1. Year-round and regionally balanced tourism (e.g., music events and festivals outside the tourist season) and strategic goal 3. Innovative and competitive tourism (e.g., innovative music offerings, digitalization opportunities in innovating music

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<sup>1</sup> <https://mint.gov.hr/strategija-razvoja-odrzivog-turizma-do-2030-godine/11411>, retrieved 28.10.2023.



offerings and promotions), as well as the specific goals of the National Sustainable Development Plan until 2027 - specific goal 1. Development of temporally and spatially more evenly distributed tourism traffic and specific goal 2. Repositioning Croatia as a year-round authentic destination for sustainable tourism. The valorization of sound and music must also serve the purpose of achieving these goals. The innovation of music offerings and promotions should be implemented at all levels of Croatian tourism (destination level, various hotel and tourism companies). The development concept comprises the analysis of the current state of music offers and promotions in a situation analysis of the competitiveness of destinations, the definition of goals as well as concrete strategies and measures for the innovation of music offers and promotions in the repositioning of destinations as attractive music tourism destinations, events and festivals. Audio management synergistically connects all stakeholders in the development of music offers and promotions based on audio and acoustic ecology in the definition of audio events and experiences as well as audio branding to achieve strategic destination development. The innovation of the development concept and the improvement of audio management must be based on the knowledge gained from the results of scientific and professional research (analysis of scientific papers and professional studies) and the active participation of musicologists and professionals in the development of management models and tools. The profiling of the music offer and promotion must be the result of a focus on the target market segment (CRM), but also on the competition (business intelligence), with the active involvement of the local population in the profiling of the authentic offer (affirmation of traditional local music as a distinctive element in the presentation of its peculiarities).

Market research (Research on the current state of sound and music management in Croatian tourism<sup>2</sup>: Analysis of destination management attitudes and Research on the future state of sound and music management in Croatian tourism: Analysis of destination management attitudes) shows that there is no system for managing music (from the level of individual offer providers to the level of tourist destinations at all levels, to the level of Croatian tourism). Music is not included in strategic destination development planning. Although music concerts are the highlight of tourist events, practise shows that music in Croatian tourism is perceived as a means of entertainment that is subject to the tastes of the local audience rather than foreigners and is based on the personal preferences of the organisers and not on the analysis of tourist preferences (different demands and interests of domestic and foreign guests and the local population) or on the principles of evaluation and assessment of music events. Nevertheless, Croatia is recognised as a destination for music festivals due to successful entrepreneurial projects based on market postulates, and music festivals are becoming the main motive for tourists (e.g. Ultra Split, Sea Star Festival Umag, Rise Up Poreč, INmusic Festival Zagreb, etc.). Music events and festivals (e.g. Omiš Festival of the Dalmatian Klapa, Zlatne žice Slavonije Požega, Osor Musical Evenings, etc.) Music as part of the event programme (authentic events, e.g. Varaždin Špilberk, Varaždin Špilberk, Varaždin Špilberk). E.g. Varaždin Špancirfest, Čakovec Porcijunkulovo, Krapina Week of Kajkavian Culture, Krk Fair, etc.), music museums (e.g. Museum of Tambura in Slavonski Brod, Museum of Bećarac in Pleternica) are becoming key motives for tourists and destination brands. The research results demonstrate the need to rethink the inclusion of music in the tourist offer of destinations, with an emphasis on the affirmation of music tourism and all elements of music offer and promotion (music in accommodation facilities, music in wellness, music via loudspeakers in squares, music in the retail network, music festivals, music museums, music in promotion, etc.), all forms of music (concerts, music festivals, music parties, music workshops, music tours, sound therapies, music-inspired gastronomy), all types of music (pop music, rock music, traditional music, church music, jazz music, spiritual music). Music

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<sup>2</sup> Stipanović, C.; Grgurić, D. Istraživanje sadašnjeg stanja upravljanja zvukom i glazbom u hrvatskom turizmu: Analiza stavova destinacijskog menadžmenta 2019., Croatian Tourist Board and Faculty of Tourism and Hospitality Management



is an expression of authentic offerings and the local population as presenters; music is an element of the universal offer (popular music of all forms and types) and an element of the application of digitalisation and artificial intelligence in contemporary music (electronic music). At the same time, it is necessary to think strategically about audio branding that clearly associates and emphasises the specific features of tourist destinations (e.g. tambura music as a determinant of Slavonia, klapa singing as a determinant of Dalmatia, and music in Roženice and Sopile as a determinant of Istria and Kvarner). The richness of intangible cultural heritage related to traditions or living forms of expression that are passed on from one generation to the next will be presented in four sections in the Google Arts & Culture and HTZ (Croatian Tourist Board) project in 2020: Knowledge of crafts, folk songs and dances, ceremonies and food, including klapa singing and the folk song bećarac. A successful example of audio branding is the “Sound Atlas of the Homeland” at Rijeka Airport, a six-hour sound composition that presents the sonic characteristics of Primorje-Gorski Kotar County through three of its components - Gorski Kotar, Primorje with its hinterland and islands, and their cultural and natural diversity. Audio branding can be based not only on musical performances as an accompanying element to trade fair presentations or promotional materials designed with sound, but also on the creation of a recognisable sound brand and logo to create a positive perception in the minds of potential tourists.

The future enhancement and use of music in tourism products and promotions must be based on the principles of audio management, as a result of market research analysis (analysis of tourists and local population, analysis of the potential of music events for attracting tourists, but also for the development of the destination and the local community), but also visionary thinking on how to turn music and sound into a recognisable product (affirmation of positive elements and elimination of negative elements – noise and sound pollution) and into a clear musical identity in repositioning the destination.

## **5. CONCLUSION**

Music tourism is becoming increasingly important in the development of tourism products on a global scale, recognising and appreciating the specific characteristics of musical expression and the traditional values of a destination. In addition, universal popular music is being recognised and valued. The most crucial segment of music tourism is music festivals, which serve as the main motivator for tourists, and other music events, which are increasingly becoming an integral part of a destination’s overall product. At the same time, audio branding is becoming increasingly important, with destinations differentiating themselves from the competition through their musical logo. In the academic literature, the trends in the development of music tourism are analysed systematically and more comprehensively from the perspective of the music offer (especially music festivals) and less from the perspective of music advertising and audio branding.

The research focuses on specific studies at festival and destination level, with no application to global trends or the level of hotel and tourism companies. Autochthonous music in offers and promotions, which offers the opportunity to be used as a differentiating element and distinguishing feature for uniqueness and rich tradition, is insufficiently researched in scientific papers. The study shows that the scientific literature insufficiently examines the conceptual applications of music in tourism. Despite the increasing importance of music tourism for the growth of destinations, there is a conspicuous gap in academic research on the integration of music. Existing knowledge is primarily focussed on specific cases and there is a lack of comprehensive studies on the systematic integration of music in the development of destinations. Furthermore, the lack of scientific underpinning in the study of practical examples using music for destination development emphasises the need for further research

in this area. To promote deeper understanding and informed implementation, future studies should address the holistic integration of music into tourism strategies to provide a solid foundation for practical applications and contribute to the overall advancement of the field.

The results of scientific research need to be used for a stronger valorisation of sound and music in the development of the Croatian tourism offer and tourism promotion at all levels. Croatian tourism makes insufficient use of music and sound in its tourism offer and promotion, and there is a lack of systematic management and synergy in its implementation at all levels. The use of music and sound must be implemented both at the destination level and at the level of individual service providers (accommodation facilities, wellness centres). Music tourism based on festivals and the valorisation of musical heritage and audio promotion offers an opportunity to reposition Croatian destinations on the market as music and sound destinations (e.g. the Sea Organ and the city of Zadar). Music festivals can become an important motivator for tourist arrivals, while traditional music can become an important audio brand for destinations. The basic prerequisite is the implementation of the principles of audio management based on the synergy of all stakeholders and all management functions, focusing on culture, knowledge and tourists in order to enhance sound and music in achieving the vision of tourism development and market recognition.

**Acknowledgment:** This study was financially supported by the project “The Role of Audio Management in Tourist Destination Development” of the University of Rijeka (uniri-drustv-18-39).

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UDC 316.772.5-057.36(497.5)  
Preliminary Communication  
<https://doi.org/10.2507/IJVA.9.2.3.104>



Received: November 5, 2023

Accepted for publishing: December 18, 2023

## DIGITAL COMMUNICATION OF POLICE OFFICERS DURING THE COVID-19 PANDEMIC

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### **Abstract**

*This qualitative study aims to determine which digital communication channels and for what purposes were used by police in rural and suburban parts of Croatia during the COVID-19 pandemic and the obstacles they encountered in doing so. The purpose of the research is a scientific contribution to communication and police sciences, given the lack of such research not only in Croatia but internationally. The practical purpose is the identification of possibilities and limitations of digital communication in policing and aspects of police communication that are important during crises. The semi-structured interview was used in four focus groups of 10 research participants. The results show that during the COVID-19 pandemic, at the request of citizens, police officers often resorted to communication via social media, even though such a method of police communication was not defined as official at the time and despite other serious obstacles such as insufficient technological infrastructure and lack of access to the Internet. The need to create precise work guidelines was identified to avoid problems and prevent citizens' resistance towards introducing such novelties. This research also points to establishing guidelines and communication protocols between public services to avoid confusion and misinformation.*

**Keywords:** *police, COVID-19 pandemic, digital communication, rural areas, suburban areas*

### **1. Introduction**

Communication through digital channels has become increasingly common in the modern age, especially during the COVID-19 pandemic, which drastically and dramatically changed the daily life of people all over the globe almost overnight (Kaplan et al., 2020). Considering the fact that a strict lockdown has been introduced at the time when the pandemic was at its peak in Croatia, and that even after the loosening of the measures, for months there was an insistence on minimizing in-person contacts and maintaining social distancing, it is clear that this must have affected communication channels in all spheres of personal and professional life. Many people worked from home instead of at their workplaces, pupils and students attended classes remotely, meetings of representative bodies were held using various suitable digital platforms, state and local administration authorities, i.e. public institutions stopped receiving citizens in-person and also started providing services through intended digital channels.

The police is a public institution that is responsible for the internal security of the state, meaning that the police take care of the safety of people and property, and enable the realization of all human

rights and freedoms within state borders (Kutnjak Ivković et al., 2023). Although the possibility of reporting a suspicious or illegal event to the police through digital channels has long been accepted as a form of police work facilitation with the advantage of keeping police officers in the field (Smith, 2005), during the pandemic it has become a necessity, at least in situations of reporting low-priority level events (Hobbs, 2020). In a report issued by the Police Executive Research Forum (2021) in the USA, based on relevant research, experiences and the impact of the pandemic on police work, it was emphasized that communication during the pandemic was a key component. It was also pointed out that communication and IT systems must be able to adapt in the short term and that the way in which agencies communicate both with each other and with key stakeholders has probably been permanently changed. Additionally, the report noted a significant increase in the use of social media in the execution of police work. However, one of the challenges of this type of communication is the identification of a person being communicated with. In the event that a person is not known, there is a risk that it is not a person they claim to be and that official data is being accessed without authorization, which can constitute a significant problem, especially in terms of police work, since the police collect and process data for the purpose of enforcement of its legal powers and such data may include: identification data, data on criminal activities, data on misconducts, etc. Therefore, according to the results of this research, it is recommended that the first contact in official communication be established in the form in-person visit or via a video call, in order to verify authenticity of a person being communicated with. After that, communication can continue via Email or other digital channels.

Thus, police communication in virtual space shows certain specificity in comparison with other public services and institutions. It is therefore not surprising that studies show that the digitization of the police is not taking place at the pace that would be possible in line with the development of modern communication and information technologies (Waddington, 2019), which could have been a serious problem during the COVID-19 pandemic.

An additional challenge can be the fact that, from the perspective of citizens, there are objective (for example, access to the Internet connection) and subjective (for example, older age, underdeveloped digital competence etc.) restrictions on the use of digital communication channels, which in Croatia is almost typical for rural and suburban areas.

Therefore, the goal of this research is to determine which digital communication channels and for what purposes were used by police officers during the COVID-19 pandemic in the performance of police activities in rural and suburban parts of Croatia and the obstacles they encountered in doing so. The purpose of the research from a scientific aspect is a scientific contribution to communication and police sciences, considering the lack of such research not only in Croatia, but also at the international level. The practical purpose consists in the identification of the possibilities and limitations of digital communication in the performance of police activities, and in the identification of aspects of police communication that are important in crises.

Considering the previously highlighted challenges of digital communication in rural and suburban communities, this research was conducted in Slavonia as a part of Croatia dominated by such areas. The aim of the research was operationalized through the following research question:

How do police officers evaluate the application of information and communication technology for the exchange of official police information during the COVID-19 pandemic?

The research used a qualitative research approach that was conducted using a focus group in the form of a semi-structured interview.

## 2. Theoretical and conceptual framework

Paul Watzlawick's theory of communication (Watzlawick, Bavelas and Jackson, 1967) represents one of the most influential theoretical frameworks for the study of communication. This theory is based on five axioms that explain how people communicate with each other:

1. One cannot not communicate
2. Every communication has both a substantive and relational level
3. Punctuation of the sequence of events
4. communication involves digital and analogic modalities
5. Communication can be symmetrical or complementary.

In addition to providing an important framework for understanding the complexity of communication, the aforementioned theory also helps in identifying misunderstandings and problems in communication. Stating that it is not possible not to communicate, the author explains that any behaviour, whether verbal or non-verbal, is a form of communication. Even if we do not express ourselves verbally, that also constitutes a form of communication. The second axiom explains that in every communication, both a substantive message (what is said) and a related message (how it is said) are transmitted. According to Paul Watzlawick, determining the respective level of communication can be crucial in understanding communication misunderstandings. According to Watzlawick's third axiom, non-verbal and verbal communication have a component comparable to punctuation in written language. Punctuation refers to the way people perceive and interpret the sequence of events in communication. According to this theory, the sequence of events is not objective, but subjective and depends on how individuals interpret their experience. The following axiom explains that communication can be digital, which means that clear signs and symbols are used (content level), or analogue, meaning that nuances and emotional signs are used (relational level). Analogous aspects of communication are often subconscious and can influence the interpretation of the meaning of a message. The fifth axiom clarifies the relationship between the interlocutors, i.e. whether they have equal (symmetric communication) or different information power (complementary communication).

Paul Watzlawick's communication theory has multiple implications and areas of application. In psychotherapy, Communication Theory can help therapists recognize dysfunctional patterns of communication between family members or other groups, which can lead to understanding and breaking those patterns. In management, it can help managers improve their communication skills and understand the effect of their communication on relationships with other employees, as well as on team effectiveness and productivity. In interpersonal relations, this theory can help to improve communication skills and establish better mutual relations, and in public communication, it can help speakers improve their presentation technique, recognize potential problems in communication with the audience, and establish a better connection with the audience.

Paul Watzlawick's communication theory is an important theoretical framework for the study of communication, particularly in the fields of psychology, sociology, and communication sciences, and has been applied to various fields, including police work (Thielgen, Schade and Niegisch, 2022).

## 3. Methodology

Bearing in mind the categorization of police administrations in Croatia into four categories (Kovco Vukadin, Borovec and Ljubin Golub, 2013), the research was conducted in the areas of the largest and smallest police administrations in Slavonia: the Osijek-Baranja Police Administration, which belongs to the second category of police administrations and the Požega-Slavonia Police Administration,

which belongs to the fourth category of police administrations. In this way, it is possible to observe all local specificities especially related to the degree of urbanization of certain areas, whereby the second category of police administrations largely covers suburban areas, while the fourth category is dominated by rural areas.

A total of four focus groups were held: three in the Osijek-Baranja Police Administration and one in the Požega-Slavonia Police Administration. The focus group in the Požega-Slavonia Police Administration was conducted on December 28, 2022, and the focus groups in the Osijek-Baranja Police Administration were conducted on January 11, 2023. Each focus group lasted between an hour and an hour and a half, i.e. the shortest was an hour and 10 minutes, and the longest was an hour and 30 minutes. All focus groups were conducted during the working hours of research participants, in agreement with their supervisors, so as not to interfere with their performance of work. In addition, all the rules of ethics in scientific research on living individuals were applied, which includes voluntariness, anonymity and informed consent of research participants. Each focus group was moderated by two people. Each focus group had ten participants who are police officers working in the branches of regular and criminal police, given that these branches of the police necessarily have intensive communication with citizens in their daily work, and the nature of their police work often requires in-person contacts.

The research question was operationalized in the closed part of the semi-structured interview using the following two questions:

1. Which channels of digital communication with citizens did you use during the COVID-19 pandemic?
2. What difficulties did you encounter when using channels of digital communication with citizens during the COVID-19 pandemic?

The obtained data were presented and analysed through these two topics.

## 4. Results and discussion

### 4.1. *Digital communication channels between the police and citizens during the COVID-19 pandemic*

During the COVID-19 pandemic, many people turned to digital communication as the only way to connect with others during that period. Thus, the pandemic encouraged many who had not previously used social media or digital means of communication to adapt and get used to this form of contact with others in record time. That period also caused the intensive adoption of popular messaging platforms such as Messenger, Viber, WhatsApp and other such apps. Given that the pandemic affected all aspects of life, including police work, citizens used these applications to request information from police officers. These platforms proved to be an effective way to quickly and easily connect with police officers, which was especially important at a time when physical contact was limited or not recommended.

“During the pandemic, my Viber and WhatsApp were on fire, people contacted me privately at home, people I haven’t heard from for two years. They contacted me saying they were in self-isolation and wanted me to check something for them etc.“

„Also, during the pandemic there were many inquiries about how long people had to be in isolation. When do I have to apply for my identity card? Can I now... when we introduced checkpoints. It was mostly a bunch of questions about COVID during the pandemic. And then they find you on social media.”

Although such a method of communication with police officers has not been listed as official at that time, citizens, instead of searching for relevant information related to regulations and rules during the pandemic on official websites, very often resorted to communication using the previously mentioned digital channels for exchanging messages.

“It started, as a colleague said, with Viber, WhatsApp at the time of COVID. We were all told what was allowed, and what was not. All of that was written somewhere, but it is difficult for everyone to go and check it. Who reads that information? We read it as police officers. It is easier to ask someone than to find where the explanation is written. Or send a message via Viber or WhatsApp, which again goes back to that human laziness, it is easier to take that shortcut.”

The most common official digital channel through which police officers communicate with citizens is electronic mail, and one of the relevant items is certainly the verification of the identity of a person contacting the police in order to ensure data protection, i.e. so that the data is not disclosed to an unauthorized person.

“You know what, when the pandemic was current, we had an increased number of applications via Email or phone call. In such situations you cannot know one hundred percent whether they are the person they claim to be. That is a little tricky. If only they would come in person for the first time. After that, we can continue the communication via Email or... We had an increased number of official conversations by phone during the pandemic. But I would not recommend such practice to anyone when it comes to the first contact.”

“The official channels we have are mostly Emails. We work via Email, nothing has changed there, direct contact with individuals we normally work with...”

“First of all, you have to know if that is the person they claim to be. That is the starting point. If we refer to the Ordinance on the Confidentiality of Official Information of the Ministry of the Interior, and in there we can see which information we are allowed to disclose and which we are not. Also, to whom, meaning an individual who has a legal interest. Is that actually the person they claim to be? If you have exchanged numbers and you know that it the person, but still you are only allowed to disclose only the data which that individual is allowed to receive.”

Considering that during the discussions with the focus groups it became undoubtedly clear that citizens preferred communication via electronic mail during the pandemic, police officers responded to various types of requests via official Email (such as issuing traffic accident reports, warnings etc.). Contact information for the police administration and police stations is usually available on official websites of a given police administration, but due to the specificity of circumstance during the pandemic, it was necessary to find new ways of publishing contact details of the immediate enforcers.

“So, we put phone numbers, contacts on the front door, i.e. direct contact information of individuals who are in charge of certain policing segments and their Email addresses.”

Although the precautionary measures related to the pandemic have loosened and citizens are once again coming to police premises unhindered, the habit of using digital communication has remained, which allows people to obtain information of interest in an easier way. This is also proven by the fact that communication via Email did not decrease even after the pandemic; rather over time, additional services have become available that enable citizens and the police to have a faster and smoother dialogue.

“Communication has even increased, because now for, say, speeding traffic violations specifically, with each notification of a committed violation, we have to attach a video of the violation for each speed violation, i.e. a photo where the vehicle committing the violation can be seen, and every person who receives a notification of a violation offense receives a code through which they can see the violation on the website of the Ministry of the Interior. They also get, I believe, a notification



about the violation committed via e-Citizen system. I do not know if they can see the video there, but on the website of the Ministry of the Interior they can see the video using a code they received so they do not have to come to us.”

From the point of view of police officers, communication via Email is much simpler and more accepted than direct in-person communication primarily because it is not necessary to react immediately, but one can pause and think about what will be answered.

“Fewer parties. You get an Email, so you do not have to react right away. If someone comes to us in person, you have to answer right away. This way, we read the Email so we can think about what to answer.”

Citizens also very often used the free mobile app “MUP Sigurnost i povjerenje” (in English: Ministry of the Interior – Safety and Trust); reports were received through the aforementioned app on violations of self-isolation or quarantine measures during the pandemic, and the police often, in cooperation with citizens, acted on the basis of these reports. The application is not only related to period of the pandemic, but citizens have been happy to use it for a long time since it allows anonymous reporting of all kinds of events that threaten security. In addition, a large part of the communication of citizens, as well as business entities, takes place on social media, thus information from social media was used as an indication that business hours of catering facilities were being violated, and after checking the information, in some cases, misdemeanour reports were filed.

“... Facebook and similar networks were not used as some kind of evidence, but rather as an indication that business hours of catering facilities were being violated, etc. It served as a sort of evidence for initiating a misdemeanour report.”

Police officers cite mobile devices as a major drawback in interacting with citizens. Namely, since the police generally do not use work mobile phones, police officers sometimes, in order to help the victims of a crime as much as possible and to make the victims feel protected and safe even when the police officer is not in their physical vicinity, give their private mobile phone number to victims. After that, it often happened that that the same citizen or another member of their family contacted them using the same number for a completely different and extremely less alarming situation, even situations not within police jurisdiction. This leads to the conclusion that citizens often do not distinguish between the work of individual organizational units of the police and that most often they just want to get the desired information in the fastest way possible, even if this includes calls to private mobile phone numbers of police officers during working or private hours or attempts to communicate using various social channels and/or media.

“...they all think they can contact you for everything.”

“...but they find you on Facebook, send you a request for a message, they find a way to reach us, Požega is a small town and someone always has your phone number.”

Police officers often use mobile phones, whether work or private ones, for business communication. However, given the fact that it is not prescribed when officials should and should not be available, that there is no universal and consistent way of working, conflicting opinions are often encountered. For example, one supervisor believes that availability on a mobile phone after working hours is a big problem, while some research participants, police officers, believe that not answering the phone after working hours is the solution in this situation.

“Put yourself in their position and give your number to everyone, you would receive call 24 hours a day... especially when someone who has been in a property line dispute for the last 50 years gets a hold of you and you or a contact police officer need to solve that problem. A man would go crazy. Even if we gave out our work number, we could still be on duty 24 hours a day.”

“You don’t answer after working hours. You can receive some kind of notifications, SMS messages that may be important for the service etc. on your work phone.”

“Let’s say that it is used during working hours and then we turn it off so that we do not have to give our personal mobile phone number. From that point of view, it would certainly be easier for us during those eight hours of working time.”

As a result, supervisors in different organizational units of the police have different understanding of duties and responsibilities in that segment, and certain supervisors require their employees to be available outside of working hours. Decisive, unequivocal, clear regulations on mobile phone communication for the purposes of police work are urgently needed to ensure that police officers are not overburdened and to protect their rights and privacy. Broadly speaking, clear rules on communication by work mobile phones in police work could help to maintain a balance between operational needs and employee needs for rest and privacy.

“And what you said at the beginning that a man has a work mobile phone, now we should also call him at 2, 3, 5 in the morning. It makes no sense. Therefore, those work mobile phones are simultaneously good and bad. If a supervisor would allow it, I believe we would be available 0-24.” During the pandemic, it was not necessary to find new ways to communicate with adult citizens only. Namely, a significant part of the work of police officers is prevention work aimed at the younger population, i.e. lectures intended for kindergartens and schools. In order to make up for lectures and introducing children to topics and preventive programs relevant to their age, educational materials (obtained from the Police Directorate) were digitally forwarded to kindergartens and schools, and the teaching staff would forward them to students. Although it is assumed that a larger number of students were educated in this way, police officers do not have complete feedback on whether all the materials really reached the final recipients and how many students actually read and studied the prepared and delivered materials. However, generally speaking, digital delivery of educational materials could be an effective way to implement prevention projects during a pandemic or in situations when police officers are unable to give live lectures.

“We asked them for feedback if they discussed the material with the children. Fifty percent did not respond at all. How can we know whether they discussed the material or not?”

During the interview, research participants stated that they performed tasks related to the implementation of protection and precautions measures, especially during the pandemic, by contacting individuals by phone. They mostly gave out their personal mobile phone number because even contact police officers do not have a work mobile phone. This lack of work mobile phones represents a challenge in the performance of police work, especially in situations where it is necessary to establish quick and effective contact with citizens.

### *3.2. Obstacles in digital police communication during the COVID-19 pandemic*

Certain research participants express concern regarding insufficient information among citizens on the possibilities of digital access to the police and emphasize that access to the Internet represents a significant problem in certain areas. Furthermore, they mention that an often occurrence is that colleagues do not have the possibility to communicate through an encrypted digital channel during interventions (handheld or landline connection), especially in rural and suburban areas where the signal is weaker.

“Not to mention the connections that are not present in some villages or where we have an ordinary connection and you do not have a signal, bad batteries etc. And we are supposedly talking about technology.”

“Yes, but it was extremely bad. We were losing communication all the time. Our software crashed.” Apart from the fact that officials are sometimes hindered in their work by a weak signal, the equipment itself is a much bigger problem. Police officers express dissatisfaction with the IT equipment they use for their work because, in their opinion, this equipment is outdated and limits their work, which

is a major drawback in the daily performance of police work. They believe that eliminating this problem is necessary in order to be able to discuss any improvement of communication through digital channels.

“We have four computers, you can work on one as intended, while on the other three it takes half an hour to open Word, not to mention anything else.”

“But computers as computers. Everything takes a long time to open. They are slow. A single action takes a very long time.”

“Ordinary mail takes an hour to reach you. What can I say, I am sending an Email to my colleague from my computer, I ask the colleague if he received it, he says he did not.”

“Actually, it was well thought out, but technological support failed.”

Given the fact that the police often have to communicate with citizens by telephone, there are often difficulties in establishing telephone communication, since some police officers can only communicate using landlines within the Ministry of the Interior, and in order to make outgoing telephone calls, they have to call through the central office or use services of a secretary. However, it is not clear whether these are technical deficiencies or the decision of a supervisor, or the lack of trust of a supervisor in their subordinates.

“Some offices do not even have an outgoing telephone line. So you have to call the central station to connect you with others.”

“Not some, no departments have it apart from a duty officer, at least at our station.”

The aforementioned limitations in communication create difficulties in the work of police officers. This can cause indignation from citizens who complain about the impossibility of direct communication with the police, but having learned from the negative experience after giving personal contact to individuals, many police officers have given up this communication method.

“For example, I had a case where I was conducting measures, meaning complete measures<sup>1</sup> ... And then, when I started working here, the problem was that there was no outgoing telephone line. And then I have about forty measures, I need to establish contact with someone to talk, I have to do something, I constantly have to go through the central office. So I decided to use my phone. Then the same thing happened, as my colleagues said, people started disturbing me in the evening when I am at home or... one lady even threatened me through messages... because she believed I was constantly disturbing her, that was constantly controlling her. And things like that. So I gave up, I no longer communicate using my phone.”

The limiting factor in the use of digital communication channels is also the level of authority. Namely, most of the operational staff do not have permission to access social media, so the request for authorization should be submitted to the Chief Police Commissioner who will decide on granting access to social media.

“Yes, you must provide a reason why you are requesting access to Facebook. You have to give an explanation. An official request that is sent to the commissioner and the commissioner approves it.”

Although they understand that it is necessary to keep up with the times and that communication through digital channels should be clearly defined and prescribed, police officers are not sure whether these defined conditions will bring only positive aspects or if the system would become overloaded at some point, thus making work in such an environment contradictory.

“Well, look at what my colleague said, that is how we manage and make things easier for ourselves. If that were prescribed, we would have to have it. Now, would that be easier? Would that be easier? It would be easier, would it not? That is the question, we do not know the answer because we do not have it”.

<sup>1</sup> It is not possible to provide full quote in order to maintain confidentiality of the identity of the research participant.

“The infrastructure cannot keep up with it, ours at least, to accomplish what we really want. The most ordinary, who here has a mobile phone, the most ordinary mobile phone is ten times stronger than the computer in the station that you have. Not to mention the Internet speed and things like that.”

Criminal police officers and other branches of police state that during the COVID-19 pandemic their work did not change significantly as they continued to perform police duties and apply police powers, in combination with the application of additional precautions to protect themselves and others from the transmission of the disease.

“As far as our service and general treatment of citizens is concerned, as far as the criminal police is concerned, everything was the same, because we have to receive a report from citizens directly, and conduct an investigation. It does not matter whether we want it or not.”

“Nothing changed for us during the pandemic, we could not investigate an accident remotely, we had to come in the field and talk to people, we just kept a certain distance. Or when we asked drivers for their licence...”

It is obvious, therefore, that it was not possible to move part of police activities to virtual space even during the time when the strictest measures to combat the COVID-19 pandemic were in force, which places the police at the same level as the health system and other services whose main task is care for the life and physical integrity of people.

## 5. Conclusion

It is quite clear that effective and transparent communication with citizens leads to an increase in citizens' trust in institutions (Alessandro et al., 2021), but this research, based on the experience of police communication during the COVID-19 pandemic, showed that quality communication is not only a matter of individual communication skills of employees of these institutions, but requires certain organizational assumptions, especially in crisis and complex situations.

Maintaining privacy and boundaries between work and private life has become increasingly important in today's digital age. Many employees feel uncomfortable giving out their personal mobile phone numbers for work purposes and are afraid that they will be available 24 hours a day, i.e. outside of working hours. This is particularly important in cases where employees are faced with challenging situations that require immediate action, as is often the case in police work. As a possible solution, the idea of using a work phone only during working hours is suggested. In the event of the need for urgent intervention, a call can be taken over by the Police Operations and Communication Centre, which is staffed 24 hours a day, 7 days a week. This research has shown that this problem is not adequately addressed by regulations providing for the performance of police work and clearly and unequivocally separate rights and obligations during working hours from those in private time. Maintaining privacy and boundaries between work and private life also has a positive impact on productivity and employee satisfaction (Derks and Bakker, 2014). Employees who have clearly defined boundaries between work and private life are often happier and less stressed, which can contribute to better performance in the workplace (Grant, 2013). Vrh obrasca Dno obrasca

Organization of the police in Croatia is hierarchically structured, which means that there are different levels of management, with clearly defined tasks, powers and responsibilities (Kovčo Vukadin, Borovec and Ljubin Golub, 2013). In such a hierarchical structure, police officers usually receive orders from their superiors and are required to follow them strictly. This is an essential part of police culture and is key to the effectiveness of the police organization, and it came to the fore during the COVID-19 pandemic, since this research showed that police officers did not have the option to choose whether to act in person or remotely. Their work did not experience significant changes as they

continued to perform their police duties and exercise their powers, but with additional precautions to prevent the spread of the disease.

This research also showed that limitations in police communication with citizens by telephone create difficulties in the work of police officers. The aforementioned limitations in communication create problems in establishing direct contact with citizens, i.e. police officers face the indignation of citizens who complain about the impossibility of direct communication with the police. Some police officers have given up this way of communication because of negative experiences after giving personal contact information to individuals. In addition, a limiting factor in the use of digital communication channels is the level of authority. Police officers are not sure if the defined conditions of digital communication will bring only positive aspects or if the system could become overloaded at some point and work in such an environment would become even more difficult. The results of the research show the need to define and prescribe a uniform attitude in all police administrations.

The results of this research showed that police officers generally do not want work mobile phones, which was argued by everyone from the perspective of their workplace. Thus, different types of police indicate different problems, i.e. for criminal police it can be dangerous because of contacts with often extremely violent profiles of people, and for contact police it is a problem because they communicate with an extremely large number of citizens. In fact, they pointed to serious limitations and indicate the need to regulate the practice in the case of obtaining work mobile phones. Therefore, the results of the research clearly indicate the need to create instructions with precise definition of work guidelines in order to avoid potential problems, but also to prevent people's resistance when introducing such novelties.

Considering that most events take place in public places, and that citizens pass through these spaces and a large part of them have mobile phones, information can be easily spread in real time. Live recordings can be broadcast on various platforms such as Facebook, Instagram and Twitter, and the information can be further shared and viewed later. The number of people who will see such information depends on the number of followers and viewers on those platforms. While one could argue about ways of preventing the spread of such information, it seems almost impossible due to the ever-increasing availability of technology and the extremely large increase in the number of mobile device users. Viewed from that standpoint, the technological progress of society also causes numerous problems for the police, which is not the case only in Croatia, but foreign research has also reached the same conclusions (Marx, 2007; Deneff et al., 2012), but a difference has been detected between countries regarding the dynamics with which their police manage to face these challenges. Undefined communication coordination of emergency services creates a negative impression in the community. It is necessary to prevent information from being published unchecked and without permission. Considering that information can spread quickly and far through social media, the consequences can be serious. This research points to the need to establish clear guidelines and communication protocols between different services in order to avoid unnecessary chaos and misinformation.

When considering the aforementioned practical implications of this research, it should be taken into account that it was conducted only in one part of Croatia. A kind of limitation is also found in the selected theoretical framework, since the Theory of Communication is based on Western culture, so it may prove insufficiently applicable in other cultures that have a different approach to communication. Bearing in mind the two-way communication as well as the aforementioned limitations of the research, the perspective of future research opens up in the direction of repeating this kind of study in other police administrations in Croatia.



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UDC 374:502.131.1-057.875  
Preliminary Communication  
<https://doi.org/10.2507/IJVA.9.2.4.105>



Received: November 3, 2023  
Accepted for publishing: December 18, 2023

## LIFELONG LEARNING FOR SUSTAINABLE DEVELOPMENT – STUDENT'S PERSPECTIVE

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### **Abstract:**

**Purpose** – The purpose of this paper is to determine the knowledge, views and opinions of students about sustainable development and lifelong learning as a part of education for sustainable development.

**Design** – The empirical part of the paper consists of the results of a primary research conducted among students of higher education institutions.

**Methodology** - An online questionnaire was distributed among students using convenience and snowball sampling to select students from different backgrounds, who then completed standardized instruments. The research was conducted using the survey questionnaire technique. For analysing the data, descriptive statistics were used.

**Approach** - Quantitative method of research.

**Findings** - Results of the empirical research of students' knowledge, views and opinions on sustainable development and lifelong learning for sustainable development are presented. The research shows which learning outcomes, techniques and topics students found most valuable to achieve sustainable development.

**Originality of the research** – There is a lot of research on sustainable development, education for sustainable development as well as lifelong learning but a very small number connects all of the above. Most studies on education for sustainable development focus on higher education. This paper contributes to the discussion of the concept of education for sustainable development in the context of lifelong learning.

**Keywords:** sustainable development, education, lifelong learning, students

## 1. Introduction

The primary notion of sustainability goes back many centuries, but it appeared on the international political agenda just recently because of the recognition of the fact that the human ecological pressure on the planet is much greater than what nature can renew or compensate for (Leal Filho et al., 2018: 131). The importance of sustainable development (SD) was first brought to the public in 1987, when the UN's World Commission on Environment and Development issued a report called "Our Common Future". A need for global action appeared with problems such as hunger, poverty, health issues, ecological devastation, etc. International cooperation and global partnership are necessary for development to be sustainable. In September 2015, a plan to achieve a better future for everyone in the next fifteen years called the "UN Program for Sustainable Development 2030 (Agenda 2030)"

was adopted. It offers a new path to sustainability with Sustainable Development Goals (SDGs). They are taking into account social, environmental and economic well-being while opening a door to equality, justice and prosperity. Particular attention is paid to education as a tool to achieve all the SDGs (Zhang et al., 2020). Recognising the importance of education for sustainable development led to the adoption of the Strategy for Education for Sustainable Development in 2005 and the Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4 in 2015. The latter emphasises education as a key driver of all 17 goals of the Agenda 2030. „Education for Sustainable Development (ESD) is a concept that evolves in line with emerging sustainability issues. In the 2030 Agenda for Sustainable Development, ESD is embraced in Goal 4, Target 4.7, and reflected in other Goals and Targets. The approach towards the 2030 Agenda is important, not only because of the crucial role that education will play in the implementation of the Goals, but also in increasing its impact by orienting towards the emerging sustainability challenges“ (Shulla et al., 2020: 458). The objective of this paper is to review the theoretical background of sustainable development, education for sustainable development and lifelong learning for sustainable development. This paper will also determine the students' knowledge, views and opinions on SD in general, the way they learn, key learning outcomes to engage in SD and the most necessary topics of a lifelong learning program in connection to SD. An online questionnaire, using Google Forms, was distributed among students via e-mail and for analysing the data, descriptive statistics was used. The main goals of this research are to find out the level of knowledge about sustainable development among higher education students in Croatia, their attitudes on the importance of sustainable development for the future of humanity and key factors in achieving it, most useful learning and teaching methods, learning outcomes and lifelong learning program in connection to sustainable development. The hypotheses that will be tested with this research are:

H1 Students believe that education is the most important factor for achieving sustainable development. With this hypothesis the intention was to explore if students understand the importance of education in achieving sustainability.

H2 Students will recognise the importance of participatory, process- and solution-oriented educational methods.

This hypothesis is meant to explore if students recognise the importance of new learning and teaching methods.

H3 Students connect sustainable development mostly with environmental issues.

Since a lot of authors claim that education for sustainable development is about ecology and the environment, this hypothesis tries to establish if the students share the same opinion.

## **2. Theoretical and conceptual background**

### *2.1. Defining sustainable development*

The term sustainable development is used in many areas of life and determines the direction of progress of every society. It implies economic development with consideration of environmental principles. The goal of SD is accomplished through a dynamic process of enhancing the technical and technological work basis, the increase of social wealth and quality of life without disregarding the need for environmental protection, as well as preserving resources for future generations (Popović et al., 2019). The Lexicon of Sustainable Development mentions the definition of SD that is the most well-known and most frequently used. It was published in the report “Our Common Future” by the UN World Commission on Environment and Development in 1987. According to that definition, SD is a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs“. It can also be defined as a process of changes

aimed at increasing the ability to meet needs and aspirations, through mutual coordination of the use of natural, cultural and all other resources, investments, technological development and institutional changes and their preservation for future generations (Angelevska-Najdeska & Rakicevik, 2021: 210; Smolčić Jurdana, 2018: 244). Sustainable development addresses humanity's aspiration for a better life while observing the limitations imposed by nature (Fonseca, Domingues & Dima, 2020: 1). It is a deviation from the static perception of the existing situation because of its focus on the process of changes over a longer period. The use of natural resources, the direction of investments in technological development and the development of institutions are adapted to the needs of current and future generations (Korošec, Smolčić Jurdana, 2013: 608). We think of sustainable development as an ongoing learning process that explores questions and dilemmas, where appropriate responses and solutions may change as our experience increases based on knowledge, understanding, attitudes, skills and values (Vujičić, 2008: 126). SD includes economic vitality, equity, social cohesion, environmental protection and sustainable management of natural resources. It should be understood as creating innovative economies that focus on people and take into account their skills, needs and expectations respecting the dynamically changing world (Szopik-Depczyńska et al., 2018). SD is the only alternative development model constructed so far. It has been a notion without a significant long-term substitute for almost thirty years (Matešić, 2020: 153). Sustainable development must be acknowledged as a decision-making strategy by all stakeholders from the local to the global level in order to advance in the societal transition and to become entirely operational (Waas et al., 2014: 5526).

Current ideas of SD can be traced to a variety of antecedents. Western environmental and conservation movements, international organisations and conferences such as the 1972 UN Stockholm Conference on the Human Environment and the 1980 World Conservation Strategy are frequently mentioned. Influential publications such as Carson's *Silent Spring* (1962) and Hardin's *Tragedy of the Commons* (1968) should also be mentioned. By accentuating the relationship between human beings and our use of nature, they have successfully constructed the links between the environment and development, which are central to current concepts of sustainable development (Liburd, 2010: 2). With the United Nations Conference on Environment and Development (UNCED), Rio de Janeiro (Brazil) in 1992, the necessity of sustainable development received global recognition. The Declaration formulated a comprehensive explanation of sustainability for the first time. But the most important of all was the adoption of Agenda 21, a comprehensive action program for sustainable development in the 21st century. The United Nations Conference on Sustainable Development (UNCSD), abbreviated as Rio+20, held in 2012 in Rio de Janeiro (Brazil) resulted in the agreement of the member countries to initiate the process for the development of a series of Sustainable Development Goals (SDGs), which will represent the global development agenda for the period after 2015. In September 2015, all 193 member states of the United Nations adopted a plan to achieve a better future for everyone in the next fifteen years called "Transforming our world: the 2030 Agenda for Sustainable Development" (Agenda 2030). At the heart of the mentioned Agenda are 17 linked development goals that integrate and balance the three dimensions of sustainable development (Zmijanović, 2018: 24). Their role is to enable easier implementation of SD (Vukobratović, Rončević 2020: 98, 99). Agenda 2030 puts a greater emphasis on the integration and balance among the dimensions of SD than the previous policy documents (Sinakou, Boeve-de Pauw & Van Petegem, 2017: 4).

Croatia has been involved in global and European processes of discussion and planning of sustainable development from the beginning and supports the key documents in the field of sustainable development (Ministry of Foreign and European Affairs, 2019 in Vukelić, 2021: 22). Croatia supported Agenda 21 and the Action Plan adopted at the 1992 UN Conference on Environment and Development. At the 'Rio+20' conference on sustainable development in 2012, Croatia supported the final document



“Future we want“ (Zmijanović, 2018: 24; Meštrović, 2022: 20). National Council for Sustainable Development was established in 2018. Its main purpose is to propose measures and activities and to monitor, coordinate and analyse the implementation of the goals of the Agenda 2030 (Ministry of Foreign and European Affairs, 2019 in Vukelić, 2021: 22). Next steps towards achieving the SDGs were the publication of the Voluntary National Review of the UN 2030 Agenda for Sustainable Development Implementation in 2019, and the National Development Strategy in 2021, with four priority strategic development directions: Sustainable economy and society, Strengthening resilience to crises, Green and digital transition, and Balanced regional development (NN 13/21).

## *2.2. Education for sustainable development*

The concept of education for sustainable development was created in the 1990s with the aim of using education as a means to achieve sustainability (Mrnjauš, 2008 in Bulić, 2018: 27). The beginning of the idea of Education for Sustainable Development occurs within Agenda 21 in Chapter 36 – “Promoting Education, Public Awareness, and Training“. Leaning on the Agenda, the United Nations Economic Commission for Europe (UNECE) adopted the Strategy for Education for Sustainable Development in March 2005. The aim was to encourage UNECE member states to establish and incorporate ESD into their formal education systems but also in non-formal and informal education. The Strategy accentuates that the meaning of sustainable development is evolving and that the development of a sustainable society should be seen as a continuous learning process. It claims that learning targets for ESD should include knowledge, skills, understanding, attitudes and values. ESD demands a reorientation to handling problems and identifying possible solutions in such a way that retains its traditional focus on individual subjects but also enables multidisciplinary and interdisciplinary examination of actual situations that influence curriculum structure and teaching methods. Rončević (2011: 20) believes that it is necessary to increase awareness and knowledge about the ways of practical realisation of SD in everyday life. Following the UN Decade on ESD (2005–2014), the Global Action Programme on ESD (2015–2019) was adopted with the aim of encouraging concrete ESD activities (UNESCO, 2014). Currently, the active framework is Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030) for the period 2020 - 2030. The Incheon Declaration for Education 2030 was adopted in May 2015. The Declaration states that education is at the heart of the Agenda 2030 and key to the success of all sustainable development goals (Incheon Declaration and Framework for Action for the Implementation of Sustainable Development Goal 4, 2015: 7).

Croatian Sustainable Development Strategy adopted in 2009 directed Croatia towards sustainable development and is based on various general principles, among which is education for sustainable development. The key challenges of achieving SD in Croatia were based on eight main areas. In each of them, it was required to fulfill certain assumptions, including raising the educational level of all citizens and building a knowledge society (Vrbanec, Garašić, & Pašalić, 2011: 25). Action plan for education for sustainable development was adopted in 2011. It was an instrument for the implementation of the Sustainable Development Strategy, and the promotion of sustainable development in education. ESD has a special place in the strategic documents of sustainable development planning in force in Croatia. The National development strategy, adopted in 2021, in its strategic goal 2. named “Educated and employed people”, states that education plays a key role in preparing future adults for life in the community, primarily through instilling common values and accepted norms of behaviour (National development strategy 2030, NN 13/21).

Education and training for sustainable development imply radical changes in the cultural and educational sphere because they strive for a different approach to the adoption and application of knowledge, skills, and behaviour of individuals, and communities, based on new values (Rončević,

2011: 28). Education can change behavior and inform citizens on key competencies to achieve sustainable development. Education for sustainable development should be implemented at three levels:

1. formal education in teaching institutions,
2. outside the usual educational institutions, for example through non-profit activities organisations (informal education),
3. through the media (newspapers, television, radio) so that education for sustainable development would be an integral part of everyday life (informal education) (Bačun, Matešić, Omazić, 2012: 188).

The Handbook for ESD states that education for sustainable development is education for life, for everyday behavior and action. Other than knowledge, it is necessary to develop a willingness to get involved and act according to one's own beliefs and principles (Education for sustainable development, Handbook for primary and secondary schools, 2011: 19). Such education includes recent knowledge from different fields of science. It also accentuates the development of different skills and habits that are necessary to contribute to a more sustainable world (Egaña del Sol, 2020: 1; Rončević & Lončarić, 2021: 116). UNESCO's definition of ESD states that "Education for Sustainable Development empowers learners to make informed decisions and responsible actions for environmental integrity, economic viability and a just society for present and future generations while respecting cultural diversity" (UNESCO, 2009 in Shulla et al., 2020: 5).

ESD is primarily transformative education aimed at building capacity to deal with the challenges of sustainable development, but also a method of teaching aimed at developing awareness, competence, knowledge, skills and attitudes in such a way that each activity related to its operation supports the satisfaction of the needs of future generations (Vukelić, 2020: 17; Zwolińska, Lorenc & Pomykała, 2022). It is an evolving concept aimed at providing an understanding of the relationship between sustainable development issues and the development of knowledge, skills, perspectives and values, which will enable people of all ages to commit themselves to creating a sustainable future. ESD's motivation for achieving a sustainable future is the change in individual behaviour and motivating collective action (Frisk, Larson, 2011). The quality of learning, partnership and cooperation in a pleasant and stimulating environment needs to be improved in order to implement sustainable development in education (Močinić, Čatić & Tatković, 2008: 346). Education is no longer seen as an end in itself but rather as a key instrument for bringing about the changes in knowledge, values, behavior and lifestyles required to achieve sustainability (Stanef, Manole & Militaru, 2012: 4508). The discussion on the goals of sustainable development and aspects of sustainable development is extremely complex and layered. This can be explained by the fact that the purpose of SDGs is to solve all the problems of today's world and share the responsibility for a better and more sustainable future among all people and economies around the world. In order to contribute to sustainable development, individuals must learn to understand the complex world in which they live and must be able to collaborate, speak up and act for positive change. Education is recognised as a key driver of increasing awareness, enabling better management, critical thinking, and the development of new methods and tools for a safer and healthier world. The only way to raise individuals with sustainable development awareness is education (Aydoğan, 2010 in Atmaca, Kiray, Pehlivan, 2019: 82). Education serves as the most effective way of constituting a social and intellectual basis for the implementation of sustainable development principles and coevolution ideas. The need for ESD continues to grow as a result of the rising problems related to sustainable development. ESD is regarded as a way of forming of new consciousness and behaviour through which human development course should be adjusted (Nasibulina, 2015: 1077). The goal of education for sustainable development is to create

a contribution to environmental awareness and raise the level of awareness of the reality of the world we live in as well as encourage contributions to achieve justice and equality and respect for human rights (Meštrović, 2022: 47). Education for sustainable development should be an imperative of contemporary teaching practice in the context of broader globalisation and social changes. Careful design and continuous implementation of education for a healthy and sustainable life lay the foundation for lifelong training and proper sustainable functioning of each individual (Bulić, 2018: 27, 30).

### *2.3. Lifelong learning for sustainable development*

Education for sustainable development cannot be separated from the concept of lifelong learning. Lifelong learning is a process that was created and profiled at the end of the 20th century in Europe, and because of its importance, significance and influence on all other processes, especially those that occur in social life, it received the support of relevant educational and political subjects of contemporary society. This education enables the acquisition of competencies, professional skills and educational value orientations that are acquired throughout life with the aim of progress and prosperity in every respect (Dautović, 2014: 155). Emerging global changes at all levels, including education, include new concepts such as lifelong learning for sustainable development. With the help of these new concepts, it is necessary to modernise the existing teaching work in kindergartens, schools and higher education institutions, including all participants in education in the process with an emphasis on their key roles (Škugor, 2008: 166). Lifelong learning and SD are complementary terms and processes. Lifelong education is a necessary connecting term that is a prerequisite for sustainability (Kovačević, Mušanović, 2012: 337-338). In recent decades, the principle of lifelong learning has become central in the formulation of educational policies worldwide. In the 2030 Agenda for Sustainable Development, lifelong learning has been identified as crucial for achieving sustainable development and quality education. By embodying the need to promote lifelong learning opportunities for all, policymakers have recognised that education should reach beyond formal education (Webb et al. 2019: 237). In the Agenda 2030, education is emphasised as a means to achieve all 17 goals, but it is stressed that one of the goals is to develop and provide inclusive and quality education and the promotion of lifelong learning opportunities (Vukelić, 2020: 142). Sustainable Development Goal 4 calls on us to „ensure inclusive and equitable quality education and promote lifelong learning opportunities for all“ (UNESCO 2021: 114). ESD is considered within the United Nations as a conceptual approach that includes aggregate components such as education that gives students the opportunity to acquire the skills, ability to act, perceptions, and knowledge necessary to ensure sustainable development, education with the aim of forming socially responsible citizens and strengthening democracy, in which individual citizens or their associations exercise their rights while fulfilling their civic responsibilities and lifelong learning (Zhang et al. 2020). ESD's central mandate of creating responsible, global citizens is predicated on the ability to cultivate communities which embrace and practice lifelong learning (Stiglitz, Greenwald, 2014 in Egana Del Sol, 2019: 8). It is a lifetime process going beyond the limits of formal education and existing in a form of lifelong learning (Nasibulina, 2015: 1078). Education and learning are changing due to today's dynamics of economy and living provided by the easy access to the internet. Business and education are often interconnected in order to deliver the most efficient learning programs. If e-learning provides the core elements that bring satisfaction to users it is considered a sustainable lifelong solution for both academic and business areas. Through proper design and content of the virtual platform, e-learning becomes an effective and efficient alternative for continuous learning (Pamfilie et al., 2012: 4029, 4030). Flexible learning environments are vital for creating a sustainable lifelong learning process (Sangiuliano Intra et al., 2023: 9). Educational technologies have brought about fundamental

differences in the teaching-learning environment in schools. They introduce some newer redefined responsibilities for teachers of being more than mere instructors to becoming facilitators and co-creators of the learning environment (Kurian, Ramanathan, Andrić, 2018: 6)

Lifelong learning, which in its interior incorporates cognition and knowledge, requires the investment of all available resources of human capital and physical capital for the sake of success and sustainable development (Dautović, 2014: 153). Considering the enormity of problems the international community is facing, including climate change and the growing precarity of employment, the re-emergence of lifelong learning may lead to educational reforms that will improve people's lives. There is optimism that policymakers will develop greater awareness of the need to think outside of the box in order to effectively deal with global problems (Elfert, 2019: 551). Lifelong learning is one of the most important tasks facing the countries under the Sustainable Development Goals 2030, since possession of innovative knowledge and qualification, the ability to study throughout life is one of the modern variables in the world (Kuzior et al., 2013: 10).

### **3. Methodology**

#### *3.1. Methods*

The methods used in this paper are inductive, method of analysis and synthesis and descriptive method. The methods applied encompass general and logical analysis, and comparative and generalization methods. For the purposes of collecting empirical data on the selected variables, a network survey procedure was used, and as an instrument, a multiple questionnaire structured from several different content-construct units. Primary research was conducted in 2022 among 142 students of Croatian higher education institutions. The research was conducted online, using the survey questionnaire technique distributed to the students via e-mail.

#### *3.2. Sample profile*

For analysing the sample profile, descriptive statistics were used. The majority of the respondents were between 20 and 29 years of age (77,5%) and the least were those younger than 20 (5,6%). Most of them live in bigger cities (40,8%) or in the country (39,4%) and only 19,7% live in small cities.

### **4. Results**

Students assessed their current knowledge of sustainable development as average. 64,8% claim to know the most important subjects but 29,6% say that their knowledge is little or negligible. Still, 70% of the respondents believe that SD is very important for the future of humanity. When it comes to key factors in achieving SD, 86,6 % of students believe it's education.

Students consider that workplace experiences are the most useful learning and teaching method (Graph 1.). They also find discussions and problem solving useful. Surveys are the least useful learning and teaching method, according to them.

When it comes to learning outcomes students believe that creative thinking, overcoming obstacles or problem solving and cooperation or teamwork are key to engaging in SD (Graph 2.). They find that negotiating and building consensus isn't very important for sustainable development.

Students find that the most necessary topics of a lifelong learning program in connection to sustainable development are environmental protection and waste management but they find other topics such as energy efficiency and corporate management very important as well (Graph 3.).

Students think that sustainable development is practiced very little in our country (Graph 4.).



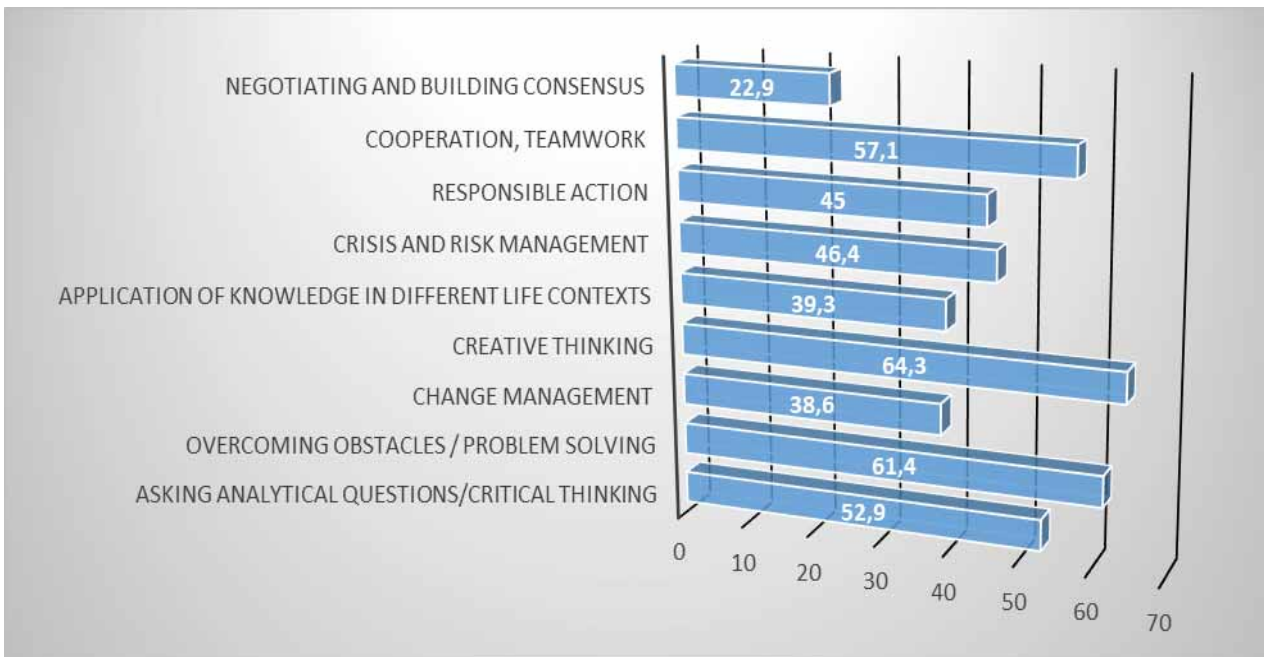
Most students believe that there is no universal recipe for sustainable development but recognise that some good examples from other countries can be used in Croatia (Graph 5.).

**Graph 1. Which learning and teaching methods do you find most useful?**



Source: Author

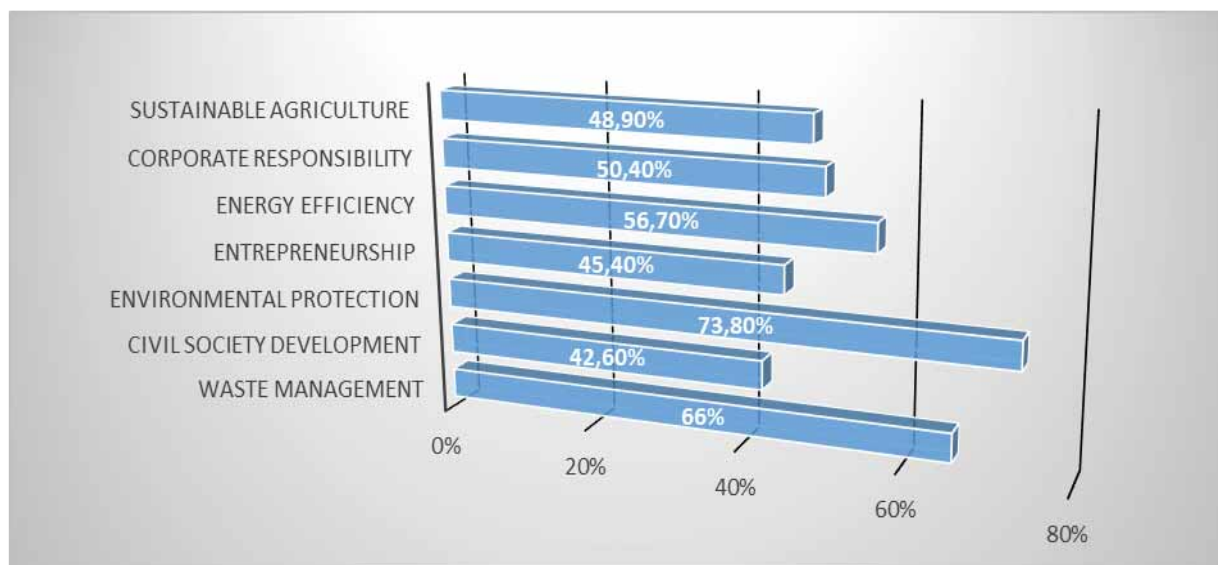
**Graph 2. What learning outcomes do you consider key to engaging in sustainable development?**



Source: Author

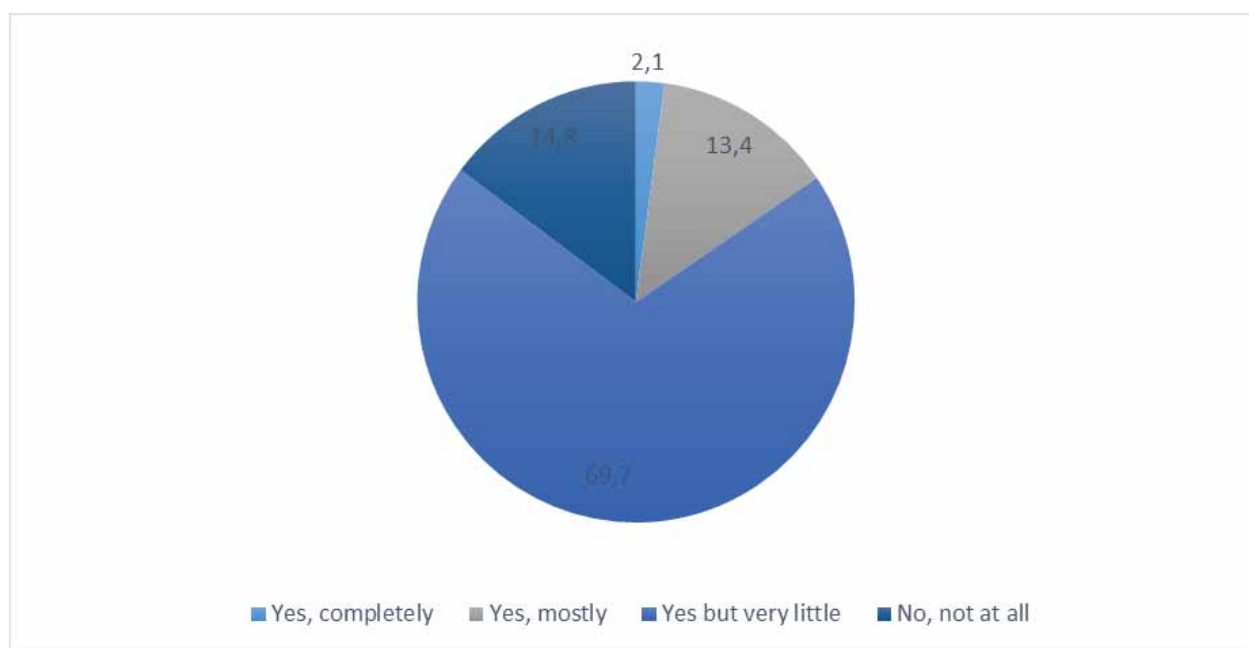


**Graph 3. Which topics of a lifelong learning program in connection to sustainable development do you consider the most necessary?**



Source: Author

**Graph 4. Do you think that sustainable development “lives” in practice in the Republic of Croatia?**



Source: Author

### Graph 5. Do you think that there is a universal recipe for sustainable development?



Source: Author

## 5. Discussion

The goal of this research was to find out the level of knowledge about sustainable development among higher education students in Croatia, their attitudes on the importance of sustainable development for the future of humanity and key factors in achieving it. The students were asked for their opinions on the most useful learning and teaching methods recommended by the UNECE Strategy For Education For Sustainable Development as participatory, process- and solution-oriented educational methods tailored to the learner. Also, their opinions on the importance of the learning outcomes stated in the Appendix 1 (b) of the Format for reporting on the implementation of the UNECE Strategy for Education for Sustainable Development and the Incheon declaration and lifelong learning programs in connection to sustainable development.

The hypothesis was that students believe that education is the most important factor for achieving sustainable development. This hypothesis was confirmed. Another hypothesis was that students would recognise the importance of participatory, process- and solution-oriented educational methods. This hypothesis was partially confirmed. The hypothesis that students connect sustainable development mostly with environmental issues was confirmed.

## 6. CONCLUSION

Educators and researchers need a solid reflective process regarding ESD in general and Goal 4.7 in particular. This reflection needs to be questioned, adopted and included in further development of the intentions and facilitation of ESD. The pursuit of sustainable development is dynamic therefore reflection, learning, and adaptive learning processes and actions are required (Giangrande et al., 2019: 3). The implementation of sustainable development in everyday life will be possible only at the moment when awareness and sense of responsibility increase, i.e. at the moment when people acquire new knowledge and skills about the ways of practical realisation of this paradigm, and therefore the education system has a great responsibility in achieving this goal (Rončević, 2011: 40). Education for sustainable development is gradually increasing its influence on educational and educational

processes, but it is still not generally accepted or even generally welcomed (Blewitt, 2017). As our economies and societies change, lifelong learning will need to extend far beyond labour market purposes. Opportunities for career change and reskilling need to connect to a broader reform of all education systems that emphasizes the creation of multiple, flexible pathways. Like education in all domains, lifelong learning needs to be reconceptualised around learning that is truly transformative (UNESCO, 2021: 114, 115). On one hand, the development of the knowledge society could contribute to the realisation of the intellectual ambition that is the basis of sustainable development. On the other hand, we can build hope in the possibility of solving current and future problems on the assumption of the development of creative abilities, empathy and readiness to act of young generations. Therefore, it is unusually important to carefully and systematically build, encourage and promote togetherness and quality communication, reflection, discussion, discussion, as one of the possible ways to achieve sustainable development (Vujičić, 2008: 130). This research shows that the student population does not fully understand the true concept and importance of sustainable development in everyday life and the future of society. A large number of students believe that education is the key factor for achieving sustainable development. Still, students connect sustainable development mostly with environmental protection and a responsible economy but don't fully recognise the importance of society, which includes education, as the 3rd pillar of sustainable development. The connection between the three is what enables sustainability and education is the key to achieving that connection. Future research should include more participants, especially those who finished their formal education in order to recognise which skills they need in their everyday life to work and live more sustainably. The research topics could lean on previous research for comparison but also be broadened with other important factors that conceptualise lifelong learning.

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Received: August 5, 2023  
Accepted for publishing: October 4, 2023

## BANK TERM DEPOSIT SERVICE PATRONAGE FORECASTING USING MACHINE LEARNING

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### **Abstract:**

*Term deposit is one of the financial services offered by the bank. An effective bank marketing campaign to forecast possible customers to engage in personal term deposit marketing interaction is vital because it's hard to stand out, considering that all banks offer similar products. Trailing to this, this study proposed the use of machine learning algorithms to develop bank term deposit patronage forecasting models, which can study the characteristics of customers to identify potential term deposit customers. Random Forest and Xtreme Gradient Boosting algorithms and the Portuguese institution marketing campaign dataset, were used to develop a bank term deposit service patronage forecasting model. The data balancing algorithm utilized is the Synthetic Minority Over-sampling Technique and Edited Nearest Neighbors (SMOTE-ENN) and feature selection was conducted using Information Gain. The Random Forest model achieved an accuracy of 95%, recall of 92% and f1 scores of 94%. Xtreme Gradient Boosting model achieved an accuracy of 97%, recall of 97% and f1 scores of 97%. The results of the experiment revealed the Xtreme Gradient Boosting emerged as the best model*

### **Keywords:**

*marketing, bank, term-deposit, patronage, Random Forest, Xtreme Gradient Boosting*

## **1. Introduction**

Banks are service institution that basically offers their customers and business owners a place to stow their cash and also source loan. Other bank services include among others; savings, deposits, insurance, remittance, bill discounting, foreign exchange facilities, payroll services, loans etc (Flohr-Nielsen , 2002: 476). However, globalisation is growing faster than ever and in consequence banks are beginning to beam more effort at reinforcing the internationalisation of their services. This became imperative because banks have been encountering numerous challenges during the past two decades, including competition, recession and image problems (Czinkota and Ronkainen, 2004: 4). In order for banks to solve these problems, they embrace marketing strategies which is the direct way of reaching their public (Czinkota and Ronkainen, 2004: 7). Bank representatives conduct marketing campaigns, promoting their brands through various sources of communication. This they did through the following mix of promotion; advertising, sales promotion, personal selling, public relations and direct marketing (Dawes

and Brown, 2000: 95). Despite their measures, pressure is building up for more effective marketing management of banks and banks are realising that their established marketing strategies are inadequate for new conditions as levels of customer defection is on the rise. Traditionally, banks have tried to communicate to all potential customers in their locality, but research survey revealed that banks should aim to identify and serve micro-segments (Olajide and Wreford, 2023: 86). This will help to establish and manage individual specific long-term business relationship. Also marketing of bank services is an understudied area because most banks concentrates on marketing theory more than the marketing strategy. However, effective bank marketing strategy is crucial since services are intangible products and it's hard to stand out, considering that all banks offer similar products.

Having established that individual commercial banks are responsible for maintaining the loyalty of their existing customers and attracting new ones. To achieve this goal, it is necessary to analyse the factors that affect the involvement of new customers, including the marketing activity of the bank. It is very important for banks to always be in a prominent position in front of potential customers to get as many deposits as possible. Hence this study will make use of two machine learning models to predict potential customers to patronise the bank term deposit service while drawing inferences from some predictors of past term deposit service customers of the bank. Machine learning focused on developing autonomous systems that use statistical tools to analyse data from a variety of sources and historical occurrences to arrive at logical conclusions based on their perceptions set :) (Omanga *et al.*, 2023: 77). Machine learning uses algorithms as well as data to mimic the learning process of humans, enabling machines to become better at generating predictions over time (James *et al.*, 2023: 242). The two machine learning models proposed for use in this study are namely Random Forest and Extreme Gradient Boost. This is with the view to help the bank make more effective decisions that will result to more profit, and help to allocate appropriate resources for customer specific service marketing campaign.

## 2. Literature Review

(Nguyen, 2022: 270) analysed bank customer descriptions such as age, job, marital, education, default, balance, housing, loan, contact, day, month, duration, campaigns, pdays, previous, outcome and deposit to choose possible deposit customer using deep machine learning. His work mustered up Long-Short Term Memory (LSTM), Gated Recurrent Unit (GRU), Bidirectional Long-Short Term Memory (BiLSTM), Bidirectional Gated Recurrent Unit (BiGRU), and Simple Recurrent Neuron Network (SimpleRNN) as an approach to developing a model for forecasting bank deposit customers. the resulted of his findings further showed that Gated Recurrent Unit (GRU) reaches the best accuracy with 90.08% at epoch 50<sup>th</sup>. (Kurapati *et al.*, 2018: 6) used machine learning for analysis of bank credit defaulters based on the customer's information. The research used the algorithms in Scikit-Learn for prediction and compared the accuracy of the developed models before feature selection and after feature selection. Their result reported Random Forest algorithm model to have performed well in its prediction in contrast to Decision Tree, Gradient Boosting, and Extra Tree Classifier. (Hossam, 2018: 416) deployed bagging and boosting of assemble machine learning to predict the likelihood of loan approval for bank loan applicants. In his approach AdaBoost, LogitBoost, Bagging, and Random Forest. were deployed and had almost comparable performances; however, boosting techniques performed slightly better than the Bagging techniques. The best performance was achieved by the LogitBoost model yielding approximately 84% accuracy and that performance is achieved when all the seven data set features were used. However, most deployed ensemble models performed better when the number of features was reduced to the balance, age, and job attributes.

(Jan, 2021: 450) developed financial distress prediction model using two deep learning algorithms: Deep neural networks (DNN) and convolutional neural networks (CNN). Chi-squared automatic

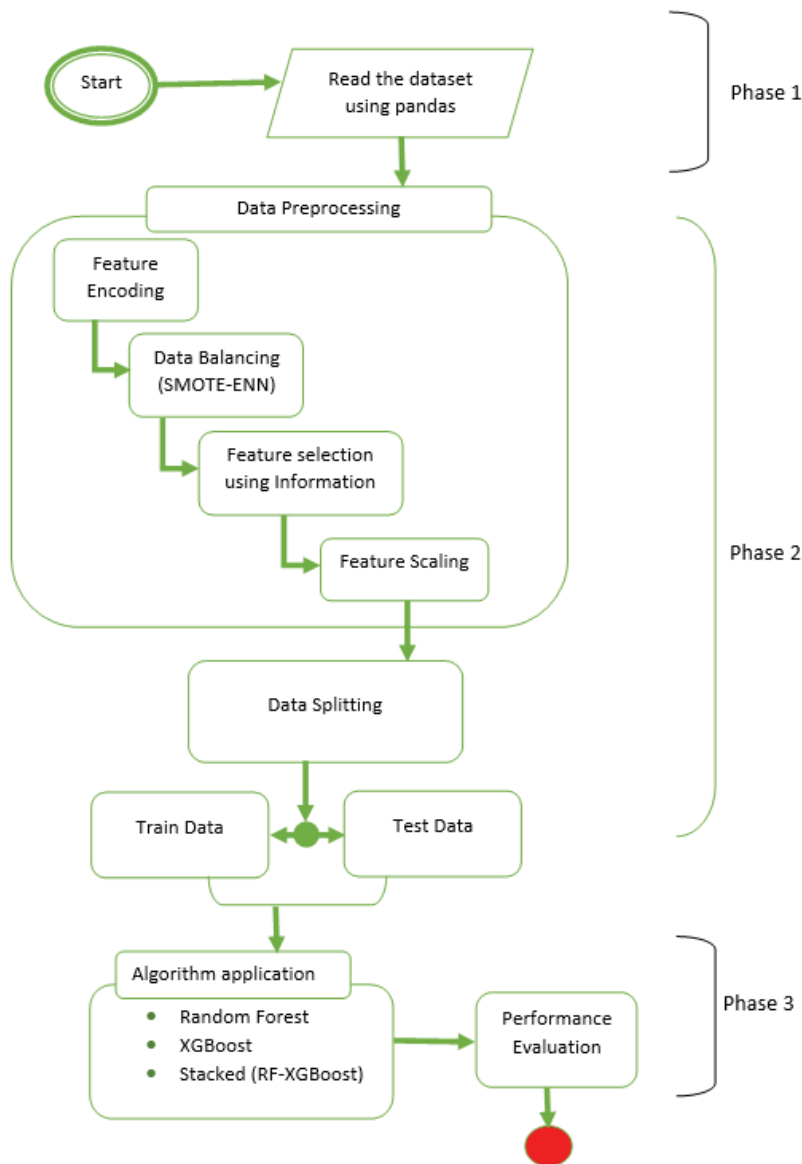
interaction detector (CHAID) was used for feature selection from Taiwan's listed and OTC sample companies' dataset. The study showed that CHAID-CNN model has the highest financial distress prediction accuracy rate of 94.23%, and the lowest type I error rate and type II error rate, which are 0.96% and 4.81%, respectively. (Gregova *et al.*, 2020: 3955) used logistic regression (LR), random forests (RF), and neural networks (NN) to predict financial distress. Fourteen financial ratios are used, and the NN model has the best performance (AUC) of 0.886. (Olajide and Wreford, 2023: 88) utilized random forest algorithm, logistic regression and relevant dataset to develop two predictive models for car-loan applicant credibility. The results from the study showed that both models were efficient in predicting the status of the car-loan credibility of customers while random forest performed relatively better than logistic regression with an accuracy of 93%, precision of 92 and recall of 1. (Muhammed *et al.*, 2021: 49) experimented and observed the performance of three classification algorithms named Support Vector Machine (SVM), Neural Network (NN), and Naive Bayes (NB) to predict the possibility of a bank customer patronising the term deposit service. Then the ability of ensemble methods to improve the efficiency of basic classification algorithms was investigated and results revealed that the performance metrics of Neural Network (Bagging) is higher than other ensemble methods. Its accuracy, sensitivity, and specificity are 96.62%, 97.14%, and 99.08%, respectively.

(Marc and Amir, 2022: 23) developed five models using Baseline, Linear Regression (LR), Decision Tree (DT) and Random Forest (RF) to demonstrate how to build an innovative market place within the banking system by leveraging bank transaction data. Their study compares the performance of baseline algorithm and RF algorithm to reveal the likelihood of buying in a range of selected industries ; gastronomy, shoes, sports, cosmetics and tourism. Where the average Root Mean Square Error (RMSE) result for baseline was 0.3742 and that of the RF was 0.3597. this indicated that RF performs better than Baseline. The research was deemed suitable for small merchants selling at a physical store. The study further recommends another type of analysis to be carried out to cater for online merchants. (Laksana, 2022: 35) uses direct market dataset based on 41188 records along with two machine learning methods namely: Logistic Regression (LR) and DT to analyse the performance of banking telemarketing campaigns. The performance of the develop models was analysed with the test dataset and it shows AUC of 0.934 with the accuracy of 0.870 and reliability of 0.869. The model is considered suitable statistically as it is not based on multicollinearity problem. (Mohammad *et al.*, 2023: 159) carried out detailed systematic analysis of the modeling of bank customer's behaviour in order to help banking institutions to make appropriate decisions to increase bank patronage. It made use of feature engineering processes such as sine, logarithm, min-max, Z-score and cosine methods, and selected machine learning methods as follows; DT, Extreme Learning Machine (ELM), Gradient Boosting, K-Nearest Neighbour (KNN) and multilayer Perceptron (MLP). The results of the study indicated that their developed knowledge mining system offers an optimal decision support system for mining bank customers behaviour. (Subramanian *et al.*, 2023: 160) developed three predictive models to classify bank customers to make bank telemarketing activities more effective.. the machine learning method used are the LR, KNN and RF algorithms. The results of the three models were analysed and RF performs the best with an accuracy of 95%.

### 3. Proposed Methodology

In an attempt to forecast customers' subscriptions to a term deposit using the Portuguese institution marketing campaign dataset. This paper devised a three-phase methodology. The first step encompasses the sourcing and reading of the dataset via Panda's Python framework. The second phase is the data preprocessing stage and it entails the conductance of data balancing considering that

the adapted dataset is highly imbalance (using SMOTE-ENN (Synthetic Minority Over-sampling Technique- Edited Nearest Neighbors) data balancing techniques) the eradication of irrelevant features such as the ‘id’ field, scaling and encoding the dataset feature variable to enable correlated variables for the features using the Standard Scaler and Label Encoders from the Sklearn library. Furthermore, the data preprocessing stage also incorporates the use of information gain as a feature selection mechanism. The third stage involves feeding the filtered, scaled, and selected features to the proposed machine learning models, namely the Random Forest, Extreme Gradient Boost, and their hybrid (using stacking hybridization techniques) after splitting the dataset into 70:30 per cent training to test proportion, with the training data meant for training the two deep network models and the test data for validation the accuracy of the model. The third phase further incorporates the conductance of a performance evaluation scheme to evaluate the best performance models and for comparative analysis. The stepwise approach for the implementation of the proposed Random Forest, Extreme Gradient Boost, and their hybrid model for the adapted Portuguese banking institution dataset is shown in Figure 1.



**Fig 1: Proposed Methodology for Developing Bank Term Deposit Service Patronage Forecasting model**



### 3.1 Dataset Description

The adapted dataset is the Portuguese bank marketing campaign dataset sourced from the Kaggle machine learning repository. The objective of the dataset is to classify and thus predict if a customer will subscribe for a term deposit as the dependent variable say ‘y’ (Moro, 2014: 25). The marketing campaigns were based on phone calls as often customers contact the bank, to access if the product termed deposit would be granted (yes) or not (no). An overview of the dataset attributes is presented in Table 1.

**Table 1: Dataset Description Portuguese bank marketing campaign dataset**

Feature	Description
Age	The age field defines the age of the customer
Job	The job here defines the job the current customer has as an occupation
Marital	The marital status of a customer can be married, single, divorced, etc.
Education	Defines the educational level of the customer
Default	Define if a customer has credit in default
Housing	Defines if a customer has a housing loan
Balance	Customers individual balance
Loan	Define whether a customer has a pending loan or not.
Contact	Communication type for a customer.
Month	Last contact month of the year
Day	Last contact day of the week
Duration	Last contact duration, in seconds
Campaign	Number of contacts performed during the campaign and for this instance client
P-days	The number of days passed by after the client was last contacted from a previous campaign.
Previous	The number of contacts performed before this campaign and for the instant client.
P-outcome	The outcome of the previous marketing campaign.
Y	Defines if the client subscribed to a term called a deposit.

### 3.2 Data Balancing Techniques

As aforementioned the Portuguese banking institution dataset contains a highly imbalanced dataset and thus requires some data balancing algorithms. Hence, the data balancing algorithm utilized is the Synthetic Minority Over-sampling Technique and Edited Nearest Neighbors (SMOTE-ENN). The algorithm combines two techniques, namely the Synthetic Minority Over-sampling Technique (SMOTE) and Edited Nearest Neighbours (ENN). The SMOTE algorithm checks the minority class label sample and randomly selects one of its nearest neighbours ‘k’ (usually k=5) before creating

a synthetic sample by linearly interpolating between the selected sample and the original minority sample. This process is repeated until the desired balance is achieved. The ENN (Edited Nearest Neighbours) utilized an under-sampling technique aimed at removing noisy samples from the dataset by checking a particular sample class label and its  $k$  nearest neighbours (usually  $k=3$ ) if the majority class samples outnumber the minority class samples among the  $k$  nearest neighbours, the sample is considered noisy and removed from the dataset, the objective is to reduce noise and potential misclassification caused by noisy samples (Muntasir, 2022: 16); (Ghorbani and Ghousi, 2020: 6909).

### 3.3 Information Gain for Feature Selection

For the selection of relevant features, while reducing the dimensionality of the Portuguese banking institution dataset and possibly increasing the performance of the machine learning models, the experiment adapted the Information Gain (IG) algorithm as the feature selection technique considering its suitability for the categorical problem as in the case of customer's subscriptions to a campaign or not. Information Gain (IG) measures the significance of a feature by quantifying the quantity of information provided about the class labels (called deposit). Hence, the more valuable a feature is for classification or prediction, the greater the information gain. Entropy is used to quantify the degree of uncertainty in a dataset when selecting the most pertinent characteristics. It is derived from the distribution of deposit labels within the dataset. Typically, the formula used to calculate entropy is founded on the concept of Shannon entropy and using the entropy formula, information gain is also measured as the degree of entropy reduction of the deposit variable after dataset division. This implies that the greater the information gain, the more useful its attribute is for distinguishing between classes. Information Gain is depicted by equation (1)

$$IG = E_{bs} - WE_s \quad (i)$$

Where IG represent Information Gain,  $E_{bs}$  is the entropy before separation, and the  $WE_s$  represent the weighted average entropy following splitting.

### 3.4 Random Forest

The proposed Random Forest algorithm is a popular ensemble learning algorithm used for classification tasks. The algorithm is based on decision trees and integrates the predictions of multiple trees to produce more precise and robust classifications. The workflow of the adapted random forest algorithm entails the creation of an ensemble of decision trees, each of which is trained on a random subset of the training data and a random subset of features, followed by the application of bootstrapped sampling techniques to each of the decision trees and the random sampling of the subsets of the decision tree with replacement. This process assures that each tree receives slightly different data, resulting in trees that are diverse and uncorrelated. Randomly selecting the subset features of the adapted dataset at each split (the splits are determined based on criteria such as Gini impurity or entropy, which measure the purity of the target class in each subset of data) increases the diversity of the trees and reduces the risk of over-reliance on any particular feature. Therefore, once all decision trees are constructed, each tree predicts, for each sample in the test set, whether the record is considered subscribed (deposit variable) by the customer or not. After that, the final prediction for a sample is determined by combining the predictions of each tree using majority voting. The class with the most votes (i.e., the most frequent prediction across all trees) is deemed the ultimate prediction for a given sample. The random forest algorithm was selected because the study demonstrated its effectiveness in classification tasks due to its capacity to handle high-dimensional data, resistance to overfitting, and ability to identify important features, making it a valuable tool for identifying customers' behaviour from a bank marketing campaign.

### 3.5 Xtreme Gradient Boost

XGBoost (Xtreme Gradient Boosting) is one of the most widely used ensemble machine learning algorithms for solving predictive and classification problems (Islam, 2022: 1005). Essentially, the algorithm combines multiple weak prediction models of decision trees into a robust predictive model using a gradient-boosting approach (Shehadeh et al., 2021: 1046). Gradient boosting is an iterative training procedure for decision trees. Throughout the process, successive decision trees are constructed, and each tree is trained to rectify the errors of the previous tree. The model begins with an initial decision tree and then adds additional trees iteratively to reduce error. Considering that the problem is a classification problem, the implemented Extreme Gradient Boosting algorithm employs the logistic loss function to measure the difference between the predicted and actual outcomes to monitor performance. This was accomplished using gradient descent to minimize the loss function. To prevent overfitting and improve generalization. The implemented Extreme Gradient Boosting algorithm uses regularization techniques to regulate the complexity of individual trees and the ensemble process as a whole.

### 3.6 Evaluation Metric

To evaluate the performance of the classifiers, some standard evaluation metrics such as accuracy, precision, recall, and F1-score. These metrics are proposed based on some machine learning evaluation parameters such as the True Positive (TP), True Negative (TN), False Positive (FP), and False Negative (FN) evaluation parameters.

- i. **True positive (TP):** defines an instance where an observation emerged from positive classes and the classifier predicted it to be positive.
- ii. **False Negative (FN):** The false-negative variable defines a condition when the actual observation from the dataset comes from a positive class label but the model predicted the label to be negative.
- iii. **False-Positive (FP)** is a condition when the actual observation comes from negative classes but the model predicted the outcome to be positive.
- iv. **True negative (TN)** identifies instances where observations from negative classes are predicted to be negative.

**Accuracy:** calculates the ratio of inputs in the test set correctly labelled by the classifier. Mathematically, accuracy can be denoted as:

$$Accuracy = \frac{TP+TN}{TP+TN+FP+FN} \quad (ii)$$

**Precision:** defines the percentage of the number of correctly predicted positive outcomes divided by the total number of predicted positive outcomes. Thus, precision can be mathematically denoted as:

$$precision = \frac{TP}{TP+FP} \quad (iii)$$

**Recall:** is the percentage of correctly predicted positive output to the actual number of positive outcomes from the dataset and can be mathematically denoted as:

$$Recall = \frac{TP}{TP+FN} \quad Recall = \frac{TP}{TP+FN} \tag{iv}$$

**F1-score** is a measure that defines the harmonic mean of the model precision and recalls and thence combines the value of the recall and precision to output a single score. The F1 Score can be mathematically expressed as follows:

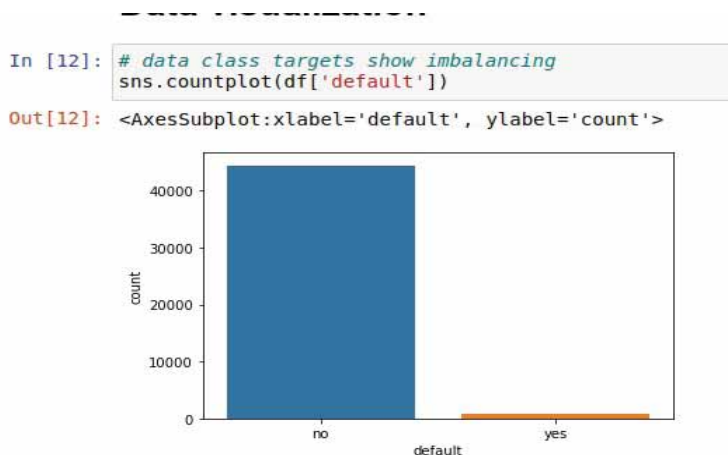
$$F_{Score} = 2 \times \frac{Precision \times Recall}{Precision + Recall} \tag{v}$$

### 4. Results and Discussions

The proposed bank marketing prediction models were implemented on a Windows operating system, using the Python programming language and the Anaconda programming environment. The system setup involved a dual-core Intel Core I5 processor with 4GB of RAM. The integrated model is comprised of the Random Forest and XGBoost algorithms. In the implementation, various Python packages were used. Considering that the models are machine learning algorithms, the Sklearn Application Programming Interface (API) was employed. Additionally, the NumPy modules were utilized for numerical operations, pandas for reading the phishing dataset, and Matplotlib for visualizing the graphical behaviour of the implemented models.

#### 4.1 Visualization of Portuguese Bank Marketing Campaign Dataset

To visualize the customers that subscribe to the campaign, the bar chart in Figure 2 was utilized via the count plot function using the seaborn packages. The y-axis shows the counts on the number of customers whereas the x-axis depicts the customers in the bar chart that subscribed as ‘yes’ or didn’t subscribe as ‘no’ to the marketing campaign. From the diagram, it can be identified that the dataset is imbalanced as the distribution has a high rate of disparity between the subscribed and not subscribed customers. The observation resulted in the need for the application of data balancing techniques.



**Fig 2: subscription counts**

The instance correlation matrix in Figure 3, uses the correlation coefficients annotated to each cell to establish the degree to which each feature is connected in the prediction of customer deposits to a marketing campaign. From the correlation diagram, a value of 0 denotes a neutral correlation, a value of -1 denotes a weak correlation, and a value of 1 denotes a substantial influence between two

factors in predicting cases whether or not an instance customer can subscribe to the term deposit after the backing marketing campaign. The diagonal axis is always equal to one because each attribute has a strong association with itself.



Fig 3: Correlation Diagram

Figure 4 shows the comparison of customers based on their respective occupations appended to the y-axis of the graph. The x-axis in the diagram shows the tally for the respective jobs. The jobs include management, technician, entrepreneur, blue-collar, unknown, retired, admin, services, housemaid, self-employed, unemployed, and students each having an aggregation of the numbers of individuals in an instance job category.

```
In [13]: # checking the number of job based on specialization of the customers
sns.countplot(y='job', data=df)
```

```
Out[13]: <AxesSubplot:xlabel='count', ylabel='job'>
```

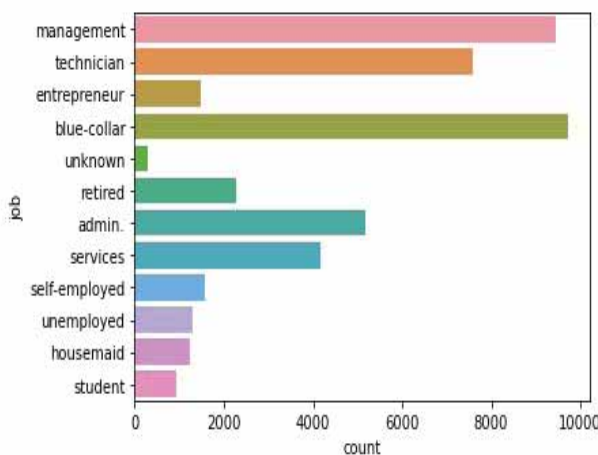


Fig 4: Correlation Diagram



### 4.2 Result Presentation

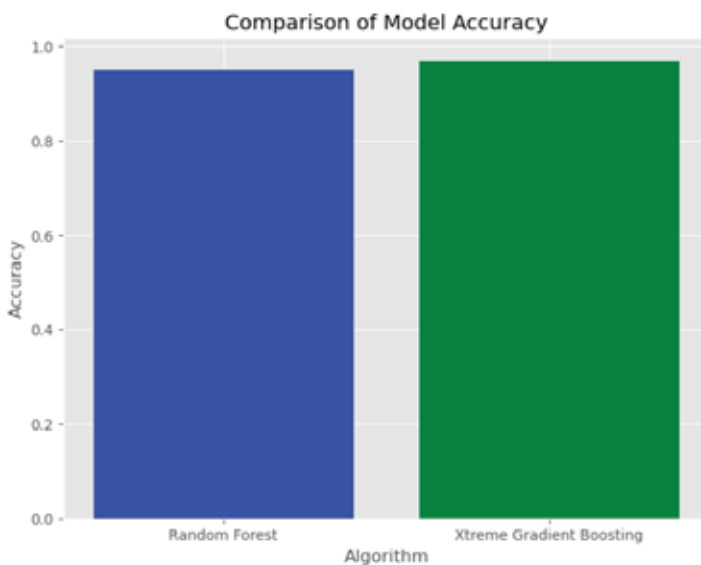
The experimental result of the research on the Portuguese institution marketing campaign is presented in Table 2. The headers provide details about the classification models developed, specifically the Random Forest and Xtreme Gradient Boosting, and the accuracy, precision, recall, and f1 scores for these models. The Random Forest model achieved an accuracy of 95%. When considering customers who subscribed to the term deposit (yes label), the precision was 96%, meaning it correctly identified 96% of the positive cases. For customers who did not subscribe to the campaign (no label), the precision was 94%, indicating it accurately identified 94% of the negative cases. The recall for the yes label was 92% and 97% recall for the no label. The f1 scores were 94% for the yes label and 95% for the no label, which are measures that balance precision and recall for each class.

On the other hand, the Xtreme Gradient Boosting model achieved an accuracy of 97%. Its precision for the yes-class label was 96%, and 97%, for the no-class label, the precision was 97%, correctly classifying 97% of the negative cases. The recall for both the yes and no class labels was 97%. The f1 score for both the yes and no class labels was 97%, which shows a well-balanced performance in terms of precision and recall for each class, respectively.

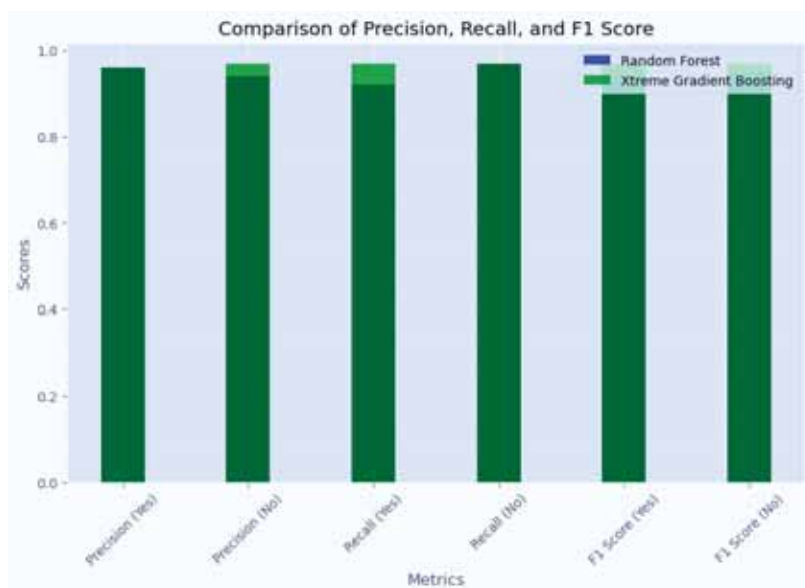
**Table 2: Models (Random Forest, XGBoost, and Stacked Model) performance evaluation report**

S. No.	Classification Model	Evaluation Metrics for the Classification Models			
		Accuracy (0/1) %	Precision (0/1) %	Recall (0/1) %	F1-Score (0/1) %
1	Random Forest (RF)	95	96/94	92/97	94/95
2	XGBoost	97	96/97	97/97	97/97

Considering Table 2, Figure 5, and Figure 6, it can be identified that the Xtreme Gradient Boost model has the best performance accuracy score, even when precision, recall and f1-score are considered. Cumulatively, it can be deduced that both the Xtreme Gradient Boost model has the best performance in the prediction of customer subscriptions to the term deposit on the Portuguese institution marketing campaign dataset.



**Fig 5: Model Performance Comparison**



**Fig 6: Model Performance Comparison based on Precision, Recall, and F1 score**

## 5. Conclusion and Recommendation

In this paper, two machine learning algorithms namely the Random Forest and XGBoost performance were evaluated on the Portuguese institution marketing dataset. The effectiveness of the developed random forest and XGboost models was validated via some performance evaluation metrics including accuracy score, precision, recall, and f1 score. Analytically, the result of the experiment revealed the Xtreme Gradient Boosting to emerge as the best model with an accuracy of 97% while the random forest has an accuracy of 95%. The results obtained can be attributed to the application of the SMOTE-ENN which uses the viabilities of data oversampling and under-sampling and also the information gain algorithm as the feature selection techniques. Future studies can apply the viabilities of artificial intelligence methods such as the Boruta algorithm for feature selection mechanisms. Furthermore, more datasets can be employed to enhance the model's effectiveness in predicting customer's subscriptions to deposit campaigns.

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**The title** of the paper should be concise and informative.

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ISSN 2412-5210



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