

BASIC CHARACTERISTICS AND SIGNIFICANCE OF FACTOR ANALYSIS IN THE PROCESS OF DIGITALIZATION OF FOOTBALL CLUBS IN THE CITY OF ZADAR

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Abstract

This paper aims to indicate the basic features and significance of factor analysis, related to researching the possibility of its application in measuring the quality of digital processes and identifying key dimensions and attributes of its quality in football clubs in the city of Zadar. Namely, many dimensions and attributes that can be used to describe and define the digitalization of football clubs' process indicate multidimensionality. The questionnaire determined the level of use of digital tools and opinions of respondents on the manner and importance of using digital technologies in the operational processes of sports clubs in the city of Zadar through the administrative and training component. Recognizing the fact that measuring the quality of digital processes involves measuring the quality based on perceptions and expectations and also to simplify the complex structure of the research problem and extract digital process factors, the paper analyzes the two main components: factor analysis of the

scale of perceptions and factor analysis of the scale of expectations. The research provides answers to several questions, while on the other hand, some questions concerning the objectives of the work are only indicated and should be elaborated in further research.

Keywords: *football, factor analysis, digitalization, business processes, modern technologies*

JEL Classification: *M15, Z29*

1. INTRODUCTION

In everyday life, and thus in athletes' lives, the word "digitalization" is appearing more and more often (Miočić, Androja & Bilić, 2020). Digitization is a new reality. It is present in the modern world all around us. The development of modern technology has encompassed the entire everyday social life, including football. There is a need to digitize the process within football clubs at all levels of competition, administration, and the training process. In the Republic of Croatia, a small number of football clubs can monitor the processes that take place within society. According to the Croatian Football Association, there are 1466 football clubs in Croatia. There are very few clubs that have relatively sufficient infrastructural and human resources to implement digitization. The above indicates the need and importance of investing society and the local environment in sports facilities and infrastructure, which will improve the quality of life of its citizens, with the prospect of changing this to society's satisfaction as a whole (Miočić, Androja & Hoti, 2020). Practice and researched literature state that most sports clubs generally use only Word and Excel tools. However, the emergence or availability at that time of popular Google solutions (Drive, Calendar, Docs, etc.) enabled them to function daily in a much simpler way (Stolterman, Croon Fors, 2004). This way of collecting, categorizing, and processing data was relatively short-lived because the documents were "scattered" on all sides. Constant attendance checking of those present at the electronic documents activities has stimulated the need to consolidate or digitize the process. Following the adoption of new digital tools and technologies and the Comet project, which are competent for use in football clubs, are beginning to be used at the state level. Sports football clubs in Croatia and the city of Zadar are increasingly involved in digitalization, i.e., "functioning without paper documentation" or "electronic business". In general, each of the two titles listed above leads to the same thing –

to stop using processes that predominantly involve “paper documentation”. The departure and primary use of paper documentation from the operational work of the sports club remind us of a quote from Henry Ford - “If I asked people what they wanted, they would say faster horses.” The processes of functioning of a football clubs have accelerated and become more accessible and transparent. The football club’s digital performance management systems made something similar to what Henry Ford wanted. Processes have been accelerated, digitized, and new, modern technology is being applied. Therefore, the question arises: “why do we think digitalization is inevitable and necessary?”. The answer lies in the digital environment, higher training expectations, reduced costs, and the club’s overall work. The area in the view is a solution for the use of appropriate modern digital systems and tools. In the presentation, this is shown by using the e-application as a tool that represents the simplest and most complete solution for a football club’s work, accordingly the management process at the administrative and training level. Constant improvement, acquisition of new skills and knowledge is equally essential for a successful sports organization, modern information technology in sports, and the user of digital systems.

This paper aims to examine the level of usage of digital tools and respondents’ opinions on the manner and importance of using digital technologies in the sports club’s operational processes through the administrative and training component. This paper’s subject is factor analysis and the possibility of its application in measuring the quality of digital processes in football clubs in Zadar and identifying key dimensions and attributes of its quality. To research respondents who wanted to determine the level of usage of digital tools, respondents’ opinion on the manner and importance of using digital technologies in the sports clubs’ operational processes through the administrative and training component, the survey method was used. Accordingly, this paper aims to point out the basic features and significance of factor analysis and explore the possibilities of its application in measuring the quality of digital processes in football clubs in Zadar and in identifying key dimensions and attributes of its quality. That aim represents hypotheses (H_0 & H_1) that will be rejected and/or accepted in this paper. Measuring the quality of digital processes involves measuring quality based on perceptions and expectations. The analysis of the main components, the scale of perceptions, and the scale of expectations have simplified the research problem’s complex structure and the separation of digital process factors in football clubs from Zadar.

2. DIGITALIZATION

Modern IT technology is a factor that significantly affects the development of society (society 5.0) and the economy within societies (industry 4.0). By interacting with the environment and processing enormous amounts of data using digital tools, complex algorithms have brought modern technology to life (Kramer, 2017). The digitization process itself is just one step in the process of delivering digitized content to users. Attempts to implement the management process's digitization in associations are carried out daily, based on trial and error method. In societies, digital transformation brings several changes for employees of non-profit organizations. It implies acquiring skills, upgrading knowledge, ways of working, and similar (Dugalić, 2018). The leader of the world's leading institute for medical research Tgen, Lowey, states that during the digitization process it is crucial to have a good team that is always ready to accept new technologies and keep pace with the technological change that goes beyond formal education (Dobrinić & Gregurec, 2016). The leader of the world's leading institute for medical research Tgen, Lowey, states that during the digitization process it is crucial to have a good team that is always ready to accept new technologies and keep pace with the technological change that goes beyond formal education (Dobrinić & Gregurec, 2016).

As such, digitization represents the transformation of an organization's business model using digital technologies. The beginning of digitalization can be considered the application of various technologies "such as Cloud computing, Big Data, Internet of Things (IoT), while nowadays in the context of digital transformation we can talk about the application of robots, artificial intelligence (AI), 3D printing, drones, that is, about the so-called "Industry 4.0" (Domitrović, 2016). Digitization and digital transformation have a significant impact on business processes carried out by organizations and associations. They change the working and the content of work, focusing on the end-user (Schreiber, 2017). Therefore, for non-profit organizations and associations to be exciting and competitive in the market and attract users, they must adapt to the requirements and change their business way. Beneficiaries do not expect associations to respond to their requests but expect them to anticipate and create their future needs. IT and its application in the business function are tools that help control management processes in organizations successfully. The application of digital tools for document management during a particular process's life cycle is of special importance (Staničić, 2009). The business function of associa-

tions includes numerous and diverse documentation, for which it is extremely important to update and archive to increase the productivity of the management process (Milanović, 2000). Digital management tools in non-profit organizations, including associations, are tools for monitoring administrative and training needs, financial tools, and tools for improving the management process. The business of associations consists of members, employees, external users, and their processes. Processes are financial reports, administrative procedures, sports results, association management, and the training process.

2.1. DIGITAL ENVIRONMENT

Man is a being of habit and thus established processes in society (Miočić & Komšo, 2020). The proverb says that “old habits die hard”, filling out forms, holding meetings with hundreds of papers, or running document-dependent processes still exist. However, in the last decade, there has been a significant “digital revolution” that the general public recognizes the effects of modern digital technology. Sports organizations, including football clubs, are increasingly embracing digital solutions, leaving “old” business processes behind. In the digital world, the computer is often the only “physical” tool needed. Fundamental changes are also happening at the micro-level. A sports club can achieve long-term savings only by centralizing its sports content (e.g., documents) in a safe and easily accessible way. A good example of monitoring the trend in the development of the digital environment is the information system of the Sports Community of the City of Zadar, with which all sports clubs can access a whole range of documents and monitor their business in one safe and easily accessible place. In this way, many clubs have accelerated their business, simplified, presented more transparently, and enabled their core business to become better.

3. REVIEW OF PREVIOUS RESEARCH ON THE EXAMPLE OF FACTOR ANALYSIS AND SURVEY QUESTIONNAIRE

Factor analysis represents a methodological framework for research in many social sciences, including kinesiology and information sciences. Factor analysis is a generic name for many procedures developed to analyze intercorrelations between a set of variables and the consequent reduction of spatial dimensional-

ity (Đonlagić & Fazlić, 2015). Requirements for a parsimonious solution to the problem is a requirement to explain as many variables as possible with a smaller number of variables, so the purpose and goal of factor analysis is the interconnection of a large number of variables with fewer latent or fundamental variables (Zahirović, 2005). Since its inception more than 100 years ago, this type of analysis has become one of the most widely used multivariate statistical procedures in applied research (Brown, 2006). The author Kurnoga Živadinović (2004) referred to the determination of products' essential characteristics using factor analysis, where she conducted empirical research. Zoraja (2014) identified three excretory factors that included 17 variables in the research "Application of factor analysis in the research of the use of information and communication technologies: the example of European countries". Research related to identifying critical factors of satisfaction with the quality of the teaching process in high school students pointed out that satisfaction with the quality of the teaching process can be expressed by four factors (Delić et al., 2013). "Recently, a survey of the competitiveness of Croatian counties was conducted by the National Competitiveness Council, which confirmed the possibility of successfully applying factor analysis in economic research" (Đonlagić & Fazlić, 2015). The authors, Bosnar and Busch (2007), dealt with the structures of knowledge about sports games, the author Uljević (2013) dealt with water polo. Several examples of the application of factor analysis in a wide range of social sciences are given, and it must be emphasized that there are still a large number of them. Based on the above, it can be argued that factor analysis has found wide application and is one of the valuable and powerful multivariate techniques for efficient extraction of information from large databases. The power of factor analysis today is best illustrated by its products, precisely in those areas that would otherwise be entirely in the power of subjectivism and arbitrary interpretations. Similar research through a survey questionnaire conducted by Kesić & Vlašić (2018), however, with different topics related to customer satisfaction and digital technology's use speaks in favor of the work. The research was stimulated by the project "Development of an innovative platform for the digital transformation of companies" and Pihir, Križanić and Kutnjak from 2018, who dealt with similar issues in the second field.

4. FOOTBALL AND MODERN TECHNOLOGIES

With the entry into force of the new Ordinance on players' and registrations' status, the Croatian Football Association has stepped into the digital age. One of the new regulations' changes is that the player acquires the right to perform the day after the announcement of registration in the IT system of HNS - COMET or the day after the Federation verified registration (HNS, 2020). Until now, the player gained the right to play only when his registration was published in the official gazette of the Federation, and as it usually comes out on Wednesdays during the past seasons, it happened that the player missed the game and waited for the right to play for several days. With the introduced changes, HNS has introduced a special section for player registrations on its official website. It will publish records of completed registrations daily, if necessary, to give players the right to play for the club as soon as possible. Modern technologies and sports are closely interconnected and complement each other at different levels and areas. Sport has contributed significantly to the fact that everyone knows everything, and information is available at every turn. As a global phenomenon, the status of sport has contributed to this, with billions of fans worldwide following events in all its branches daily. With the development of technology in all branches, sports are also developing and spreading to all parts of the world. Previously, it was impossible to travel the world as quickly as today, so the sport was reserved for the local community (Novak, 2006). There were not many opportunities for a basketball team from Poland to go to Argentina to compete with the national team, which is possible today thanks to the global development of technology, thus the availability of information, sports equipment, academies, and sports schools (Milardović, 2004). According to the above, football clubs had to adapt to new circumstances and prepare for a new way of functioning through education and training of employees and modern IT equipment.

5. METHODOLOGY

For the research, the level of use of digital tools, opinion of respondents on the manner and importance of using digital technologies in the operational processes of sports clubs from the city of Zadar through the administrative and training component will be determined. A survey questionnaire was used for the research. The survey questionnaire consists of two parts: a general part,

consisting of 2 basic questions, and a research part divided into perceptions (consisting of 3 dimensions with 23 questions) and expectations (consisting of 4 dimensions with 20 questions). The specified Likert scale questionnaire was used for the research (41 questions with 7 points and two questions with 3 points). Every question represents a variable. The general part refers to general data related to the respondent. In the second part, some questions aim to answer the alternative hypothesis (H_1) and determine digital technologies' levels and areas (Miočić et al., 2019). The survey questionnaire was constructed and then tested so that all participants in the research could complete it. The survey was sent from the mail domain of the Sports community secretary of the City of Zadar. Questions were sent to email addresses via google forms. It was sent to 76 addresses, and 59 entities responded.

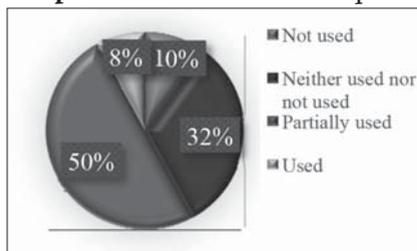
The sample exceeding 30 respondents is significant. Therefore the collected answers can be used freely in further analysis (Rozga, 2009). The respondents' sample comprises seven football clubs: Croatian Football Club Zadar, Football Club Arbanasi, Croatian Football Club Dalmatinac, Football Club Zara, Football Club Abeceda sporta, Football Club Zadar, and Football Club Zadar, which perform at different levels of competition. After completing the respondents' survey questionnaire, the questionnaires were entered in printed form into the LimeSurvey program and then exported to the SPSS statistical program for further statistical processing. The general part is presented qualitatively (general questions). To determine the correlation of a large number of variables, factor analysis was used. Manifest variables were observed using factor analysis, while latent variables were the factors to be determined. The results of the factor analysis of perceptions and expectations were calculated quantitatively (research questions). Data collection was performed based on a proportional stratified sample. It belongs to the category of random samples and allows for assessing the conclusions' degree of reliability about the investigated parameters. Since it is a question of the quality of digital processes carried out in football clubs, the categorization of sports stakeholders from football clubs was used, which is determined by the number of years of work experience. The total number of sports stakeholders is located and determined in four strata according to work experience (up to 2 years, 3-4 years, 5-6 years, and 6 and more years). The determined list is entered into a table and into the software to generate a random selection. Similarly, a list of respondents was formed for each stratum, which was used as needed.

6. RESEARCH RESULTS

6.1. THE GENERAL PART

The survey questionnaire is an additional qualitative method based on two general questions used in the research, and its purpose was to find out certain attitudes and opinions. The survey questionnaire examined respondents' attitudes, opinions on the manner and use of digital technologies in associations' daily work processes and how a segment of sports associations is most often currently used digital technologies. The first question is related to *digital technologies in functioning and business processes, administrative processes, training processes, and financial processes* (Graph 1).

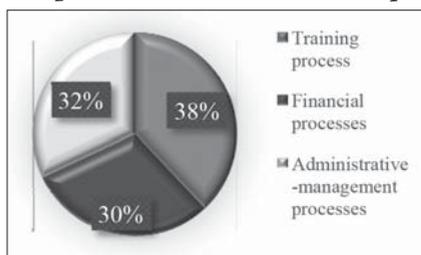
Graph 1. Results of the first question



Source: authors research

The most significant number of respondents answered that they partially use digital technologies (50%), a slightly smaller percentage of respondents (32%) answered, neither use nor do not use digital technologies. In comparison (10%) respondents stated that they do not use it, while (8%) answered that they use digital technologies. The answers to the second question related to the *internal segments of business associations and their use of digital technology, training processes, financial processes, and administrative management processes* (Graph 2).

Graph 2. Results of the second question



Source: authors research

The answers showed that 38% of respondents use digital technology for training processes, a smaller percentage of respondents (30%) answered that they use the purpose of financial processes. A similar number of respondents (32%) answered that they use digital technologies for administrative processes.

Sports associations and their members are not sufficiently familiar with digitization processes. They do not know enough about the processes carried out or that can be carried out by modern processes.

6.2. THE RESEARCH PART

6.2.1. Factor Analysis As A Function Of Quality Dimensions Of Digital Processes

The variables observed in the factor analysis are manifest variables, and the factors determined in the process are latent variables. Factor analysis deals with analyzing the very structure of correlations among many variables by defining standard basic dimensions, known as factors (Backhaus et al., 2016). To successfully conduct research, the researcher must define separate dimensions and then define the extent to which each variable is explained using each dimension (Backhaus et al., 2016). The maximum number of new variables that can be formed is equal to the number of original variables (Sharma, 1996). To reduce the number of variables, i.e., the dimensions of space, it is necessary to find criteria for rejecting new variables, i.e., retaining those variables that carry most of the information in the initial system of variables. The study used a Cattell diagram where the shape of the diagram determines the number of factors, the percentage criterion, according to which factors are excreted until factors that significantly reduce unexplained variance can be determined (Backhaus et al., 2016). For the research, the main components' analysis was performed in an unreduced correlation matrix, i.e., in the main diagonal where the units are located, including the total variance. In this way, the observed variables' total variance was analyzed into components. The main components were successively extracted, thus explaining the remaining part of the matrices with successive residual matrices. This way, the research will explain how the extracted component explains the smaller proportion than the previous component. The minimum number of components explains the maximum amount of total variance of the manifest variables (Fulgosi, 1984). The most common shortcom-

ings of factor analysis are read by the inadequate choice of variables, unstable correlation coefficients, neglect of requirements and postulates of the analysis procedure, insufficient clarity of data to detect random factors, dependence on programs, and the like (Fulgosi, 1984).

6.2.2. Bartlett's and Kaiser-Meyer-Olkin test

To determine the suitability of the data for the application of factor analysis, special conditions were examined. Since these are numerical variables, they are quantitative, where one of the main conditions is the relationship between the original variables (*correlation matrix*).

Table 1. Bartlett's and Kaiser-Meyer-Olkin (KMO) test

Description		Value
Bartlett's test of sphericity	Approx. Chi-square (χ^2)	1414.135
	df	250
	Sig. (p)	0.000
Kaiser-Meyer-Olkin measure of sampling adequacy		0.800

Source: own research

Based on the value of sig. parameters from the previous table, the null hypothesis (H_0) is rejected, which means that there is a statistically significant correlation (0.000) between the original variables and that the data of the variables used are suitable for conducting factor analysis (0.800). In this case, an alternative hypothesis is accepted (H_1).

6.2.3. Factor Analysis Of The Scale Of Perceptions

A factor analysis of the scale of perceptions was performed. After analyzing the main components, it is noticeable that three factors were singled out by the principal components' method. All factors' utilities are high, ranging from 0.465 to 0.801, indicating that three factors cover the original values' variance.

Table 2. Factor analysis of the scale of perceptions

Variable (question)		Factor structure			Extracted utilities
		1	2	3	
1.	Sports staff are ready to help each other	0.830			0.736
2.	Sports staff work in the service of sports development	0.820			0.712
3.	The professional assistance of sports staff is at an appropriate level	0.818			0.710
4.	The quality of services of sports staff is satisfactory	0.622	-0.312	0.441	0.717
5.	Sports staff are familiar with IT equipment	0.814			0.698
6.	Sports professionals are familiar with the processes of digitization	0.432	0.756		0.755
7.	Sports professionals are familiar with the concept of digitization	0.624	-0.314	0.445	0.714
8.	Sports employees know the business processes of clubs	0.552	0.325		0.478
9.	Sports staff have their own IT equipment	0.536	0.318		0.467
10.	Professional education is necessary	0.428	0.787		0.703
11.	Sports staff are willing to participate in the training	0.532	0.316		0.465
12.	Training processes are maintained following modern processes	0.612	-0.308	0.438	0.709
13.	Training processes are held regularly	0.850			0.752
14.	Do sports professionals respect the authorities of knowledge	0.599	0.336		0.499
15.	Sports staff treat everyone equally	0.406	0.762		0.761
16.	Questions and requests of members of sports clubs are resolved promptly	0.358	0.740		0.721
17.	Sports staff possess the authority of knowledge	0.633	-0.333		0.645
18.	Sports staff record attendance at the training process	0.836			0.801
19.	Sports staff keep up-to-date administrative documentation	0.550		0.601	0.700
20.	Sports club notifications are easily accessible and updated	0.450	0.780		0.732
21.	Sports clubs possess digital technology	0.693		-0.349	0.608
22.	Sports clubs have the appropriate sports infrastructure	0.550		0.603	0.701
23.	The sports staff are neat looking	0.769		-0.344	0.738

Source: own research

Based on the *scree plot* criteria, there is a noticeable break between the two factors, which confirms their separation, because the eigenvalues are separated from the remaining factors (*Cattell's*). It is implied that the above three factors explain a much higher percentage than the remaining factors.

Orthogonal varimax rotation of the extracted factors was performed for the scale of the perception. The rotation confirmed the structure of three factors (*Kaiser criterion*).

6.2.4. Factor Analysis Of The Scale Of Expectations

The general purpose of factor analysis is to find and summarize new information in many original variables into a set of more petite dimensions with minimal information loss (Hair et al., 2010).

The digitization process dimensions in sports clubs were measured using a scale of perceptions and expectations. They were subjected to factor analysis to determine whether there are basic dimensions and whether they match the digitization process's quality of services in sports associations.

Table 3. shows the factor structure of the expectations scale, i.e., the factor structure matrix for 20 variables after the analysis of the main components.

The factor structure matrix contains factor loads that indicate correlations between the extracted variables and factors. The table below shows the non-rotated factor weight of each variable for the four extracted factors where they are observed to have decent weights. For the first two factors, the value is above 0.5, while the values are slightly less for the other two factors. The results indicate that the first factor is defined by the high factor load of several variables. The communalities of all factors in this study are relatively large; therefore, low values of communalities indicate variables that could be omitted from the research, which is not the case here. It is noticeable that the percentage of the total variance is more significant than 0.60, i.e., 60%, which is the lower allowable limit in social research, and which indicates that the greater the variance, the greater the simplicity of the factors.

Based on the *scree plot* criterion based on Cattell's diagram, a break was observed between the fourth and fifth factors indicating the separation of four factors, confirming that the first four factors explain a much higher percentage of the variance than the remaining factors.

Since the initial matrix does not have the characteristics of a simple structure, a factor rotation was performed, which changes the relationships between factors and variables. After factor extraction, *orthogonal rotation* of the factors was performed using the *varimax rotation with the Kaiser normalization method*, which achieved and observed its simplicity.

According to the factor assembly matrix and the factor structure matrix, the performed varimax rotation represents the basis for interpreting factors. The two matrices mentioned above are equal if the factors are orthogonal, which is the case in this study. The research results indicate that the structure of factor loads was changed and distributed to all four factors, which indicates a better interpretation of the factors concerning the initial factor matrix. The results of the research questions follow.

Table 3. Factor analysis of the scale of expectations

Variables (questions)		Factor structure			
		1	2	3	4
1.	Sports associations provide programs for the development of athletes in full	0.740			
2.	Sports associations have professional staff for the development of football players	0.680	0.348		
3.	Due to the improvement of the expertise of coaching staff, the staff of associations goes for training	0.635		0.433	
4.	The staff of the sports association is familiar with the digitization processes	0.373	0.722		
5.	Associations use digital technologies	0.449		0.405	0.314
6.	Administrative staff respond to the needs of athletes	0.609	0.526		0.412
7.	Administrative staff are familiar with digitization processes to resolve members' requests	0.565		0.401	
8.	Administrative staff are familiar with the requirements of digitization	0.352	0.702		
9.	Athletes are familiar with modern IT equipment and its requirements		0.652	0.366	0.350
10.	The IT equipment association holds certificates	0.558	0.380		0.280
11.	The association informs its members in a satisfactory manner		0.630		0.311
12.	The results are published in an up-to-date manner		0.430		0.302
13.	Athlete diagnosis is performed in a modern way		0.389		
14.	The results of the competition team are shared in modern IT programs (HNS Comet)		0.396		0.292
15.	Administrative staff access computerization to digitization in an appropriate manner.	0.366	0.513	0.567	0.574
16.	The administrative staff is trained to use modern technologies	0.245		0.425	
17.	Administrative staff are familiar with the digitization processes in football clubs	0.287	0.565	0.361	
18.	Stakeholders have appropriate professional qualifications	0.420		0.407	0.479
19.	Sports coaches are experts in implementing the training process following modern trends		0.530		0.580
20.	Administrators in sports associations are experts in analyzing the results following modern digitization processes				0.754

Source: own research

The scale of expectations provided four factors focused on: the needs of football club members, requirements, information, and expertise for the implementation and use of digital technologies.

7. DISCUSSION AND CONCLUSION

The conducted factor analysis results show that this research does not confirm five dimensions of the quality of digital processes in football clubs from the city of Zadar, which were highlighted in the initial model.

Statements representing the dimensions of the quality of digital processes in football clubs from the area of the city of Zadar were subjected to the survey questionnaire and factor analysis. Before the analysis, the suitability of the data for both scales was assessed. The primary component analysis identified four factors in the expectations scale with values greater than 1. Based on Cattell's criteria, all study factors were retained, while *varimax rotation* was performed to facilitate data interpretation. The rotated solution indicated the existence of a simple structure. For each of the scales, a factor analysis of the main components was performed, and special conditions were examined for the suitability of the data for factor analysis (*Kaiser-Meyer-Olkin test*) in the range from 0 to 1, where a value less than 0.5 indicates unsuitability of the correlation matrix for factor analysis. Bartlett's test, conducted to test the null hypothesis (H_0), shows no statistically significant correlation between the original variables. Considering the obtained research results, the alternative hypothesis (H_1) of this paper was confirmed ($p=0.000$), which means that the research results, survey questionnaire, and factor analysis represent an adequate framework for identifying the dimensions of digital processes football clubs in Zadar. This means that the survey questionnaire and primarily factor analysis methods, as multivariate analysis methods, can successfully identify the quality of digital processes in football clubs in the city of Zadar or key dimensions and attributes of its quality. Factor analysis of the expectations scale confirmed the four-dimensional structure, while factor analysis of the perception scale determined the three-dimensional structure. Each factor is named.

The scale of perceptions includes three factors. The first factor we can call "*solving the problem of administrative operations*", and it consists of 12 variables, the second factor we can call "*transparency of data*", and it consists of 5 variables, the third factor we can call "*consistent application of processes in the training part*

of the program”, and it consists of 2 variables. The obtained three-dimensional solutions explained the variances, where the contributions were defined as 64.622% variance, the first factor 9.727% variance, the second factor 1.825% variance, and the third factor 1.140% variance.

The scale of expectations includes four factors. The first factor is called “the needs of football club members” and covers 51.056% of the total variance in the data with 6 variables, the second factor is called “requirements” and covers 6.051% of the variable and consists of 8 variables, the third “information” factor covers 5.384% of the variable and consists of only 1 variable. In contrast, the fourth factor, “expertise for the implementation and use of digital technologies” covers 4.610% of the variable and consists of 4 variables.

Factor analysis in this study was applied for extraction, i.e., identifying the dimensions of the quality of digital processes in football clubs in the city of Zadar in identifying the critical dimensions and attributes of its quality. For research and analysis, the attitudes of the respondents were used. After the implementation and processing of the data obtained from the results of the survey questionnaire and factor analysis, it was found that the factor analysis is adaptable for this purpose, which confirmed the alternative hypothesis (H_1). The survey questionnaire found that sports clubs’ stakeholders need to adopt a comprehensive and global view of technology and its capabilities. In the analyzed example based on the *orthogonally rotated varimax factor matrix*, three factors were defined in the perception scale and four factors in the expectations scale. The conducted factor analysis results indicate a pure factor structure with relatively high coefficients on the corresponding factors. The criteria used to extract the factors were based on the value - the percentage of variance in the factors’ significance and the factors’ structure. The scale of perceptions included three factors: solving administrative operations, transparency of data, and consistent application of processes in the training part of the program. The scale of expectations resulted in four factors: the needs of football club members, requirements, information, and expertise for the implementation and use of digital technologies. The extracted factors sufficiently explain the dimensions of the quality of digital processes in football clubs from the area of the city of Zadar.

Given the above, the results can be considered relevant for further analysis and research. To achieve much better results and significance, it is necessary to raise the number of respondents participating in the research. A suggestion for

future research is also to define questions and scales within the survey more precisely. Also, specify specific questions in more detail to avoid misunderstanding of the subject by the respondents. The survey itself was conducted in only seven clubs throughout the city of Zadar. The vision in the future is to do an extensive survey, which would be conducted through the parent football federations of counties throughout Croatia. Research on this example is not much represented in science, so the possibility of in-depth research on this topic should be considered. Research cognitions would lead to new ideas and insights that would significantly contribute to developing all sports segments. This research can greatly serve all sports clubs and federations to improve collecting information through digitization.

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