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Data, analysis and digitalisation as keys to the future in public and private sports management

Los datos, las analíticas y la digitalización como claves del futuro en la Gestión Deportiva pública y privada

The digital transformation is one of the fundamental pillars of evolution in all economic sectors. Among them, the sports sector is particularly affected and is joining the transformation from altruism to professionalisation in management. This article presents the results of two research studies on competence development and trends in the field of Sports Management. In the first one, the level of implementation of management tools between public and private sport services is compared, concluding that the use of big data is the tool that requires further development for the future success of sport organizations. In the second one, the current and future competences for the correct management of sport services are analyzed, highlighting how there is currently a development of competences based on digitalisation and data management below the average, being however those that require a greater development for the professional future of sport managers.

KEY WORDS: importance/valuation analysis, professional skills, management tools, management trends.

La transformación digital es uno de los pilares fundamentales de la evolución en todos los sectores económicos. Entre ellos, el sector deportivo está especialmente afectado y se unifica a la transformación del altruismo a la profesionalización en la gestión. En este artículo se presentan los resultados de dos estudios de investigación sobre el desarrollo competencial y las tendencias en el ámbito de la Gestión Deportiva. En el primero de ellos se compara el nivel de implementación de las herramientas de gestión entre servicios deportivos públicos y privados, concluyendo que el uso de big data es la herramienta que requiere un mayor desarrollo para el futuro éxito de las organizaciones deportivas. En el segundo se analizan las competencias actuales y futuras para la correcta gestión de servicios deportivos, destacando cómo en la actualidad hay un desarrollo de competencias basadas en digitalización y gestión del datos por debajo de la media, siendo sin embargo las que requieren un mayor desarrollo para el futuro profesional de los gestores deportivos.

PALABRAS CLAVE: análisis importancia-valoración, competencias profesionales, herramientas de gestión, tendencias de gestión.

1. Introduction

The scientific literature has shown that, in many cases, the best way to identify the keys to management in certain services is to compare and analyse the differences between the public and private sectors. Thus, since the entry of the New Public Management ideology with the publication of Hood's work (1991), research and practice in the provision of public services has increasingly brought municipal management closer to the business culture (Pérez-López, Prior and Zafra-Gómez, 2015). In this way, we find a vast literature in which many theories and interpretations are interwoven to determine the principles that should govern public and private management, with the aim of achieving maximum efficiency and quality in each case.

Municipal governments and their different services have been particularly affected by the reforms being carried out in the public sector (Ammons and Rivenbarck, 2008; Buch-Gómez and Cabaleiro-Casal, 2011; Kloot and Martin, 2000; Navarro-Galera, Ortiz-Rodríguez and López-Hernández, 2008; Torres, Pina and Yetano, 2011; Pollanen, 2011). Their role is increasingly important in improving the efficiency and equity of public services, as well as for economic and social development (De-Beaumont-Torres et al., 2012). In addition, more progress is often made on this type of reform at the sub-state level (Pollit and Bouckaert, 2011) and, therefore, there is greater awareness of its consequences at the municipal level.

Thus, this search for balance and efficiency in service management has been determined by analyzing the differences in different areas. Autonomy in decision-making (Desmarais and Abord De Chatillon, 2010), professionalisation and evolution in the position (Willem, De Vos and Buelens, 2010) or principles and values in management (Van Der Wal, De Graaf and Lasthuizen, 2008). However, the area where the greatest evolution can be observed is in the adaptation and use of management tools (Arnaboldi and Lapsley, 2003; Bowerman, Ball and Francis, 2001; Navarro-Galera, Ortiz-Rodríguez and López Hernández, 2008; Ter Bogt and Van Helden, 2011; Van Helden, Aardema, Ter Bogt and Groot, 2010). At this point, the bibliography so far allows us to highlight a clear sector in growth and evolution: data, analysis and digitization.

While in the 1990s companies and administrations highlighted such basic aspects as quality management or strategic planning as the most important management tools (Rigby and Bilodeau, 2019), it is from 2000 onwards that tools based on measurement, control and the use of data, such as management accounting or data benchmarking, begin to stand out (Ripoll and Urquidi, 2010). Initially, these tools were based on the use of small amounts of data for accountability purposes (Navarro-Galera, Ortiz-Rodríguez and López Hernández, 2008), however, the use of data-driven and big data has become a reality with the coming into play of the famous Smart City concept (Fitzgerald, 2016); Silva et al., 2018). Currently, management tools such as advanced analytics or digital transformation are among the 10 most important trends identified in the business sector (Rigby and Bilodeau, 2019), so public services will soon catch up.

Among all the services that can be developed both in a public and private environment, and which have therefore been influenced by this evolution in management models, we find sports services (García-Unanue, Felipe and Gallardo, 2015; García-Unanue, Felipe, Gómez-González, del Corral y Gallardo, 2016). Sports services are particularly important

in municipalities. This area aims to give the entire population access to sports and to try to increase the levels of sports practice (Liu, 2009). To this end, the municipalities control sports facilities and services under both public and private management, and promote local sports associations (Benito, Solana and Moreno, 2012; Burillo, Barajas, Gallardo and García-Tascón, 2011; Liu, Taylor and Shibli, 2007). In Spain, the dimension of this service at the municipal level acquires great relevance, given that it is the Public Administration with the most expenditure on sports, owning most of the sports facilities for public use and supporting the greatest variety of practitioners (Burillo et al., 2011; Gallardo, Burillo, García-Tascón, and Salinero, 2009; García-Unanue, Felipe and Gallardo, 2015). As a public service provided directly to a consumer, and being a sector that also presents a private offer, the management of these services requires greater control and effort on their productivity and performance (Walker, Brewer, and Boyne, 2004).

In this sense, recent studies have already shown the usefulness of data-driven in customer management, and can predict with great accuracy the casualties in sports facilities (Clavel San Emeterio, Iglesias-Soler, Gallardo, Rodríguez-Cañamero and García-Unanue, 2016). However, again there are differences in the way this tool can be implemented in the public and private sectors (Clavel San Emeterio, García-Unanue, Iglesias-Soler, Felipe and Gallardo, 2019; Clavel San Emeterio, García-Unanue, Iglesias-Soler, Gallardo and Felipe, 2020).

However, so far no study has been carried out that analyses the profile or preferences of the sports manager in relation to new technologies, big data or data driven, differentiating according to the type of management, public or private. Gallardo, García-Tascón, Burillo and Salinero (2008) demonstrated many similarities between both sectors, as both pursue excellence in their objectives, optimising available resources to the greatest extent possible. However, while these objectives may be similar, their organization and methods of operation do present big differences. Thus, Gallardo et al. (2009) show that, although the needs and problems are similar, the private sector uses a greater variety of management tools. Despite this, García-Unanue (2016) suggests that the level of professionalisation and knowledge among public and private sector sports managers is very similar, as are the problems they face, although the public sector has much less room for innovation and development.

These studies therefore lead to the conclusion that there is a need to study in greater depth what the current situation is in each sector, and what the differences are, in terms of the level of use and usefulness of data-based management. Thus, the objective of this study is to analyze the usefulness and level of use of different management tools and the evolution of sport managers' competencies towards big data and digitalisation, comparing the public and private sectors.

To this end, two different studies will be used as references in order to cover the different research questions. The first one will compare the level of implementation of management tools between public and private sport services. In the second one, current and future competences for the proper management of sport services will be analysed. In both cases, we will see how new technologies, the use of data, analysis and digital information will be the keys to the future in Sports Management, displacing classic management strategies. The work will be followed by a methodology, and then proceed to the presentation of the results and discussion, ending with the conclusions.

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2. Methodology

As mentioned in the previous section, this study has been developed based on the results of two previous research projects with similar methodologies. The first of these is a research project funded by the second call for José María Cagigal Grants, awarded by *Federation of Spanish Sports Managers' Associations* (*FAGDE*). The authors of this article are the only researchers of the project, which is original and unpublished. A comprehensive questionnaire was developed for sports managers to characterize public and private management models. For this study, the section on trends and management tools will be used.

The second is a European innovation and development project under the Erasmus Programme KA203 call for Strategic Partnerships for Higher Education, carried out by a consortium of nine universities from different countries of the European Union. In this second case current and future sports management competencies were analysed, with a sample from each of the nine countries. In order to maintain the contextualization of this study, the sample obtained by the partner will be used the *University of Castilla-La Mancha*, whose research team is comprised of the authors of this article and whose results are original and unpublished.

2.1. SAMPLE

In Study 1, the universe under study was people with management positions in companies and entities managing sports facilities and sports services, primarily oriented to sport for all, including both the public and private sectors. Finally a sample of 65 managers was obtained, obtaining a response rate of 10 %. 47 came from the public sector, specifically managers and heads of municipal sports services, while 18 came from the private sector, being directors of gyms and sports centres.

Study 2 had a sample that was determined by the needs and the protocol of the European project to which it belongs. Specifically, there was a sample of 62 sports managers and independent sports management professionals or consultants: 13 directors of sports clubs, 9 presidents of sports federations and officials of national sports organizations, 32 heads of municipal sports services and associated consultants and 8 directors of private sports facilities.

2.2. INSTRUMENT

The instrument corresponding to Study 1 was developed taking as reference the recognized survey of Rigby and Bilodeau (2019), a survey developed in an annual and biannual form by the Bain & Company's Boston office among companies of more than 70 countries, since 1993. Therefore, it is possibly the best contrasted and transversal reference in terms of the identification and description of management tools and evaluation of management trends (Ripoll and Urquidi, 2010; Rigby, 2013). This survey is made up of two sections, plus a third of sociodemographic data. The first of these establishes a glossary of trends in which one must respond with a dichotomous response, either in agreement or in disagreement. The second is composed of an importance-evaluation scale, where the level of satisfaction with the tool (evaluation) is assessed from 1 to 5 and the level of perceived utility (importance) is

Table 1. Aiken V results for the validation of the first instrument

Question	Version 1				Version 2			
	Clarity		Relevance		Clarity		Relevance	
	Average	V for Aiken	Average	V for Aiken	Average	V for Aiken	Average	V for Aiken
Socio-demographic	1.71	0.86*	2.00	1.00	1.86	0.93	2.00	1.00
Trends	1.86	0.93	2.00	1.00	1.86	0.93	2.00	1.00
Tools	2.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00

*Items that had to be rethought.

assessed from 1 to 5. Two modifications were made in the adaptation to the present study. For the first section the trends were respected, but instead of including a dichotomous response, a Likert scale from 1 to 4 was included depending on the level of agreement , while only 8 management tools were included in the second section.

This instrument was validated by a group of experts with the support of Aiken's statistician V (Gallardo et al., 2016), so that an absolute agreement could be quantified and at the same time the improvements in the worst items could be known. Taking into account that Aiken's V-values vary from 0 to 1, all those items with values lower than 0.7 were to be eliminated, those between 0.7 and 0.9 were to be modified and those with values higher than 0.9 were to be kept unchanged, both in terms of clarity and relevance. The average values of the round can be seen in Table 3.

With regard to Study 2, the instrument was again organised in a section of socio-demographic studies, followed by a scale of importance assessment of professional skills of sports managers. It specifically asked about current perceived competence (rating) and competences that will be important in the future (importance), using a Likert scale from 1 to 5. A total of 72 competencies were identified in the European project (Wohlfart and Adam, 2019), many of which are related to data management and digitisation, the objects of this study. This questionnaire was validated by rounds of experts through the participation of all the researchers of the European project, with expert doctors in Sports Management from nine different universities.

2.3. PROCEDURE

In both cases the questionnaire was carried out on-line, so it was self-administered to a sample of the population previously identified, the profile of the study was taken into account. The data collection for Study 1 took place in 2014, while that for Study 2 was in 2018.

2.4. DATA ANALYSIS

The trend analysis of the first instrument was carried out by means of a mean and standard deviation analysis, identifying those with a higher score. For the analysis of the importance/ valuation scales of both the first and second instruments, a descriptive evaluation was

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carried out, obtaining the discrepancies (gap) between the importance and valuation values. In this way, it is possible to identify those elements with the highest performance, those with the greatest importance and those with the greatest discrepancy, and the following interpretations can be made:

- Elements that are highly valued and of little importance, those that are possibly a waste of resources.
- Elements of great importance and little value, those that must be stressed.
- Elements with a lot of importance and a lot of value, those in which good work must be maintained.
- Elements with little importance and little value, those in which it is not necessary to start working.

Once the descriptive analysis was done, it was complemented by an inference analysis using a non-parametric test for related samples, as well as an inference analysis using a non-parametric test for two independent samples in the public-private sector comparisons. Additionally, the effect size (ES; d de Cohen) was included. ES can be evaluated by the following criteria: 0 to 0.2 = trivial, 0.2 to 0.5 = small, 0.5 to 0.8 = moderate, and > 0.8 = large (Coohen, 1992). The significance level was set at $p < 0.05$ and the analysis was developed using SPSS 20.0 (SPSS Inc, Chicago, IL, USA).

3. Results and Discussion

Starting with Study 1, Table 2 shows the assessments of each of the business trends identified in the *Management Tools & Trends*. We can see how the importance of innovation is the third most valued trend. In addition, managers do not perceive any technological limitations in their work. However, the importance of analytics in marketing is of average importance, and the trend with less corroboration indicates that new technologies are not expected to start spending as much as wages. Inference analysis shows no significant differences between the public and private sectors ($p < 0.05$).

These results suggest that the use of technologies is already internalised and stagnating in the daily work of sports managers. However, by contrasting these results with those of the latest survey of trends in the business sector, this conclusion can be qualified. It should be noted that the results of this study are based on the adaptation of the last published survey at the time of its completion (Rygby and Bilodeau, 2013). However, this survey has been adapted to new trends detected by experts from different sectors. Thus, in the last published survey conducted (Rygby and Bilodeau, 2019), trends appear with much agreement among the interviewees such as "Digital breakthroughs and software solutions are rapidly changing the rules of competition", "We talk about digital strategies, but we are not operating them fast enough", as well as others with less agreement such as "Our advanced analytical capabilities are world class", "We face significant gaps between our IT capabilities and business needs in the next three years" or "Our IT systems are limiting profitable growth". This comparison leads to suggest that, firstly, the trends are changing and it is not until now that real trends related to data management and advanced analytics can be identified and differentiated and, secondly, that managers around

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Table 2. Assessment of trends between the public and private sectors in order from highest to lowest

Trend	Public	Private	Total
Effective managers are necessary for success in our industry	3.52	3.56	3.53
Our current ability to adapt is a significant competitive improvement	3.36	3.44	3.38
Innovation is more important than cost reduction for long-term success	3.17	3.06	3.14
Transparency in pricing has a great influence on our pricing policy	2.77	3.11	2.87
Our management actions favour long-term results over short-term ones	2.77	3.06	2.85
We don't have the technological capacity to be leaders in the sector	2.79	2.61	2.74
Our sustainability initiatives enhance our growth and profitability	2.72	2.71	2.72
Advanced analytics are transforming our marketing work	2.48	2.67	2.53
The complexity of our organisation increases our costs and hinders growth	2.57	1.94	2.4
Customers are less loyal to our facilities than they used to be	2.28	2.53	2.35
Our current financial performance is strong	2.38	2.06	2.29
Lack of consumer awareness and vision is affecting our performance	2.38	2.06	2.29
I feel that the economic conditions and situation favor our industry (sector)	2.34	2.11	2.28
Our current information systems are limiting profitable growth	2.30	2	2.22
In the next 3 years we will be more focused on revenue growth than on cost reduction	2.07	2.38	2.15
We use skillful testing and experimentation techniques	2.02	2.39	2.13
In the next 3 years, our ICT spending will increase by the same percentage as wages	1.96	1.88	1.94

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the world are fully aware of the importance and usefulness of the new technologies, but fully agree that their implementation is taking place slowly and late.

It will therefore be necessary to contrast this same development in the sports sector. The results of the Garcia-Unanue study (2016) also showed significant differences in the concern for innovation between public and private sports managers, which again may open a gap that seemed closed, as it is more difficult or flexible to effectively incorporate big data and new analysis technologies at all levels of management.

Table 3. Analysis of the importance and value of management tools

	Public			Private			Total		
	V	**I**	**D**	**V**	**I**	**D**	**V**	**I**	**D**
Customer Relationship Management	2.79	3.05	-0.27	3.18	3.76	-0.59	2.89	3.27	-0.38
Benchmarking	2.11	2.88	-0.77	2.65	3.45	-0.81	2.25	3.06	-0.81
Work Climate Surveys	2.28	3.21	-0.94	2.29	3.18	-0.89	2.28	3.21	-0.92
Strategic Planning	3.43	3.50	-0.07	3.53	3.80	-0.27	3.45	3,58	-0.13
Subcontracting	2.64	2.94	-0.30	2.53	3.00	-0.47	2.61	2.96	-0.35
Balanced Scorecard	2.62	3.18	-0.56	3.12	3.85	-0.73	2.76	3.39	-0.63
Big Data Analysis	1.87	2.94	1.07	2.65	3.67	-1.02	2.08	3.24	-1.16
Analytical and Cost Accounting	3.09	3.46	-0.38	3.41	3.86	-0.45	3.17	3.57	-0.39

V=value, I=importance, D=discrepancy

In contrast, Table 3 allows much clearer conclusions to be drawn. It highlights how the tool known as big data is the one with the lowest performance at present and yet one of the most important from the point of view of managers. The discrepancy exceeds the unity, which allows us to conclude that the development of big data tools must be the absolute priority in the evolution of management methods in the sports area. In this regard, Clavel San Emeterio et al. (2016; 2019; 2020) highlighted the great usefulness of data driven systems as a substitute for classic satisfaction surveys, observing how big data in sports services is beginning to be optimized. Inference analysis shows no significant differences between the public and private sectors (p<0.05).

The results of Study 2 begin in table 4. In this case, the skills with the highest perceived performance today are shown. Thus, the most developed competencies of sport managers today are clearly related to communication and planning skills, as well as knowledge about the sport environment. 17 out of 72 competencies are rated above 4 points (on a scale of 1 to 5).

However, skills related to data management, innovation and technological issues are ranked below the average score (Table 5, study average is 3.7).

This result leads to an important reflection, because unlike Study 1, the data collection of Study 2 is very recent, showing that there is still a lack of competence development in data management applied to sport management. Similarly, competencies related to other important issues of business management, such as financial skills, marketing or corporate social responsibility, are also below average.

When analysing the most important competences in the future, the results change completely (Table 6). In this case, the skills that should be important for the future are strongly related to big data, analytics and digitisation. Thus, the data management competence obtained the second highest score out of the 72 competencies analyzed, finding also others

Table 4. Perception of Current Competencies

Competencies	Value
The importance of sport	4.3
Teamwork	4.2
Learning ability	4.2
Ethical commitment	4.1
Oral communication	4.1
Organisational skills	4.1
Desire to succeed	4.1
Interest in sports development	4.0
Problem solving	4.0
Ability to communicate with experts	4.0
Communication skills	4.0
Concern for continuous improvement	4.0
Adaptability	4.0
Working in multidisciplinary teams	4.0
Ability to work autonomously	4.0
Planning skills	4.0

Table 5. Results of the Current Development of Competencies Related to Big Data

Competencies	Value
Analytical capacity	3.8
New technologies	3.8
Creativity	3.7
Management of intelligence in sport	3.7
Research skills	3.7
Data Management	3.6
Ability to interpret scientific data	3.6
Use of social networks	3.5
Use of working platforms	3.5
Change Management	3.5
Digital Marketing	3.3
Change Management	3.2

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Table 6. Most important competences in the future

Competencies	Value
Teamwork	4.6
Problem solving	4.6
Data Management	4.5
Decision making	4.5
Flexibility	4.4
Working in multidisciplinary teams	4.4
Networking	4.4
Development strategies	4.4
Knowledge of second language	4.4
Analytical capacity	4.4
Creativity	4.4
Entrepreneurial spirit	4.4
Digital Marketing	4.4
Use of social networks	4.4
Management skills	4.4
Learning ability	4.4
Ethical commitment	4.4
Use of working platforms	4.4

such as data analysis skills, digital marketing, or virtual media. In contrast, other cross-cutting skills related to business management, such as human resource management, financial management and traditional marketing, rank below average (4.1 is the average). The least important requirement for management in the opinion of Spanish sports managers, this is related to sports events, legislation and corporate social responsibility.

Finally, Table 7 shows the needs for competency development, classifying the competencies with the greatest discrepancy in the importance/valuation analysis. This is where the importance of development and learning of the whole big data environment becomes more visible, because among the competencies with the 5 highest scores we find digital marketing, data analysis, data management, virtual media, use of research data and even a big data competence.

If we look at the level of significance of the competencies, in all those presented in Table 7 there are significant differences between importance and valuation ($p < 0.05$). However, the former are those with a larger effect size (or difference size), in some cases doubling

Table 7. Competitions with the greatest discrepancies

Spain "Core competences" (both 4.0 or more)	Now	Future	Difference
Knowledge of second language	3.1	4.4	1.3
Ability to use big data	3.2	4.3	1.1
Digital Marketing	3.3	4.4	1.1
Data Management	3.6	4.5	0.9
Use of social networks	3.5	4.4	0.8
Use of working platforms	3.5	4.4	0.8
Ability to interpret scientific data	3.6	4.3	0.7
Ability to work in an international context	3.4	4.2	0.7
Creativity	3.7	4.4	0.7
Marketing	3.4	4.1	0.7
Sports legislation	3.2	3.8	0.7
Knowledge of health issues	3.3	4.0	0.6
Financial Management	3.4	4.0	0.6
Risk Management	3.2	3.8	0.6
Decision making	3.9	4.5	0.6
Analytical capacity	3.8	4.4	0.6
Development strategies	3.8	4.4	0.6
Knowledge new demands	3.7	4.3	0.6
Creation of services and products	3.6	4.2	0.6
Critical and self-critical skills	3.7	4.3	0.6
Applying knowledge in practice	3.5	4.1	0.6
Sales Management	3.4	3.9	0.6
Physical activity for the disabled	3.2	3.8	0.6
Sponsorship management	3.5	4.1	0.6
Entrepreneurial spirit	3.8	4.4	0.6
Networking	3.9	4.4	0.6

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Table 8. The most important competencies in the future of each sector

Clubs	National organisations	Public	Private Organisations
Management skills	Digital Marketing	*Teamwork*	Data Management
Digital Marketing	Management skills	Problem solving	Digital Marketing
Teamwork	Decision making	Analytical capacity	Decision making
Problem solving	Creativity	Data Management	Entrepreneurial spirit
Decision making	Working in multidisciplinary teams	*Networking*	Knowledge of second language
Creativity	Problem solving	Ethical commitment	Ability to use big data
Teamwork Multidisciplinary	*Teamwork*	Decision making	
		Use of working platforms	
		Use of social networks	
		Ability to interpret scientific data	

the minimum value to be considered large: Knowledge of second language" (+1.3; $p < 0.001$; EN: 2.27), "Ability to utilize big data" (+1.12; $p < 0.001$; EN: 1.01), "Digital marketing" (+1.09; $p < 0.001$; EN: 1.24), "Data management" (+0.89; $p < 0.001$; EN: 1.16), "Use of social media" (+0.85, $p < 0.001$; EN:1.07), "Use of virtual media platforms" (+0.83, $p < 0.001$; ES: 1.06) and "Ability to make conclusions from research data" (0.74, $p < 0.001$; ES: 0.91).

When comparing the analysed sectors, it can be seen that the most important competences vary slightly. Table 8 shows a summary of the most important future competencies for each of the four sectors.

It highlights how clubs and national organisations (mostly national federations) have very similar future competencies On the other hand, the public sector presents the most differences, highlighting the inexistence of digital marketing, so important in the other three sectors. However, the conclusion remains that tin all cases there is a need to develop skills in data management and analysis.

4. Conclusions

The results of the two studies that make up this article allow us to conclude that big data, analysis and digitalisation are the tools and competencies that must be strengthened the most in the sports management sector, both from the point of view of business organization and higher education. The future of managers in any sports organization depends on their ability to exploit and take advantage of the large amounts of data generated in the daily life

of their organisations and environment, so knowing how to ask the right questions and how to answer them will be the key to success. In spite of this, it is still possible to find some differences, so we can foresee that the change will be more difficult and slower in the public sector, despite being the main support of the sport system in Spain.

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