

Monitoring social media communications of non-professional sports clubs: A rink hockey case study

Monitoratge de la comunicació a les xarxes socials dels clubs esportius no professionals: un estudi de cas d'hoquei sobre patins

Eulàlia Massana-Molera

Professora del Departament de Ciències de la Comunicació
de la Universitat de Vic - Universitat Central de Catalunya.
eulalia.massana@uvic.cat

Krishna Satish

Doctorand del Programa de Doctorat en Disseny i Comunicació
de la Universitat de Vic - Universitat Central de Catalunya.
krishna.satish@uvic.cat

José-Antonio Corral-Marfil

Professor del Departament d'Economia i Empresa de la Universitat de Vic -
Universitat Central de Catalunya.
joseantonio.corral@uvic.cat

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ABSTRACT:

Today, the importance of social media in sports marketing and communication is undeniable. Several studies investigate how sports organizations use social media to engage fans, manage brands, and cultivate relationships, primarily focusing on major professional clubs with robust marketing capabilities. However, amateur sports clubs run by volunteers often lack the means to effectively manage their digital communication. This study aims to develop an affordable system for non-professional sports clubs to monitor their social media communication. Objectives include selecting inexpensive key performance indicators, exporting them to Microsoft Power BI, designing a monitoring dashboard, and evaluating the system's effectiveness by applying it to a minority sport club. Thus, we collected and graphically represented posts published over a season on X, Instagram, Facebook, and the website of the rink hockey sports association Club Patí Voltregà. The resulting dashboard provides an overview of the club's metrics categorized by platforms, months, topics, subtopics, and competitions. Additionally, we compared its social media performance against that of its rivals in the Spanish major league. In conclusion, the research demonstrates that, despite limited resources and volunteer-run administration, amateur clubs can effectively enhance engagement and brand promotion through a cost-effective, user-friendly social media monitoring system.

KEYWORDS:

social media communication, digital marketing, sports marketing, non-professional sports clubs, rink hockey, Microsoft Power BI.



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RESUM:

Avui dia, la importància de les xarxes socials en el màrqueting i la comunicació esportives és innegable. Diversos estudis investiguen com els clubs esportius utilitzen les xarxes socials per involucrar seguidors, construir marques i conrear relacions, centrant-se principalment en clubs professionals amb capacitats de màrqueting sòlides. No obstant això, els clubs esportius amateurs dirigits per voluntaris sovint no tenen els mitjans per gestionar eficaçment la seva comunicació digital. Aquest estudi té com a objectiu desenvolupar un sistema assequible perquè els clubs esportius no professionals monitorin la seva comunicació a les xarxes socials. Els objectius inclouen seleccionar mètriques accessibles gratuïtament, exportar-les a Microsoft Power BI, dissenyar un quadre de comandament i avaluar l'eficàcia del sistema mitjançant la seva aplicació a un

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club esportiu minoritari. Així, vam recollir i representar gràficament els posts publicats al llarg d'una temporada a X, Instagram, Facebook i la pàgina web del Club Patí Voltregà. El quadre de control resultant proporciona una visió general de les mètriques del club classificades per plataformes, mesos, temes, subtemes i competicions. A més, comparem el seu rendiment a les xarxes socials amb el dels seus rivals a la principal lliga espanyola. En conclusió, la recerca demostra que, malgrat els recursos limitats i la direcció basada en voluntariat, els clubs amateurs poden millorar eficaçment la interacció i la promoció de la marca mitjançant un sistema de monitoratge de xarxes socials rendible i fàcil d'utilitzar.

PARAULES CLAU:

comunicació a les xarxes socials, màrqueting digital, màrqueting esportiu, clubs esportius no professionals, hoquei sobre patins, Microsoft Power BI.

1. Introduction

1.1. Social media in sports

The use of social media in sports marketing and communication is increasingly significant (Chadwick, Fenton, Dron & Ahmed, 2021). Within the context of sports clubs, social media communication plays a crucial role in audience engagement and brand promotion (Gutiérrez Aragón, Gassiot Melian & Alabart Algueró, 2021). Several studies have examined the use of social media platforms by sports clubs, aiming to understand their strategies, impact, and effectiveness in engaging audiences, managing brand image, and fostering fan relationships (Parganas, Anagnostopoulos & Chadwick, 2015).

Most of the research focuses on large sports professional teams, such as those that engage in football. For example, Ballesteros-Herencia (2021) describes the use of Facebook, Instagram and X by Spanish First Division football clubs in terms of the frequency of posting messages, number of online followers and intensity of engagement of users of the social networks. Likewise, McCarthy, Rowley & Keegan (2022) have explored the social media marketing strategies of football clubs involved in the English Premier League and found that social media marketing has been fully adopted as a key strategic marketing channel.

In the same way, Nisar, Prabhakar & Patil (2018) analyzed website and Facebook interactivity of the 32 football clubs involved in the 2014-2015 European Champions League, and found that designing an interactive social media presence, for instance on Facebook, can increase fan involvement with the club, and that this interactivity is more important than the club's on-field performance in driving spectator interest. Furthermore, Vale & Fernandes (2018) conducted a web-based survey among football club fans of a major UEFA league on Facebook and found that clubs can foster fan engagement on social media by catering to fans' informational, empowerment, and brand attachment needs, as well as providing opportunities for social connection and community building.

Some studies focus on other major sports, such as basketball, cricket, or ice hockey. For instance, Wang (2021) conducted a content analysis of NBA teams' tweets to explore how they leveraged X for public relations. The study revealed that sports organizations employed various X communication tools, including hyperlinks, hashtags, public messages, and retweets, with hashtags being the most used. For their part, Abeza, O'Reilly & Seguin (2019) interviewed professional sport managers in the four major North American leagues (MLB, NBA, NFL, and NHL) to explore social media use in relationship marketing, and described the platforms adopted, the intended objectives, the opportunities provided, and the challenges of social media as a relationship medium. Additionally, Annamalai *et al.* (2021) have investigated the impact of Facebook content types and vividness on fan engagement, focusing on six cricket clubs from the Indian Premier League.

1.2. Non-professional sports clubs

Sports clubs play a prominent role in the social fabric: in Europe there are around 700,000 sports clubs, with 60 million members. In addition to their historical roots, sports clubs are characterized by the following features: voluntary membership, orientation to the interests of members, democratic decision-making, voluntary work, autonomy, non-profit and solidarity (Breuer *et al.*, 2015; Breuer *et al.*, 2017; Nagel *et al.*, 2020).

The tip of the iceberg of the sports industry is made up of a minority of professionalized organizations. Most of the existing research on social media in sports focuses on professionalized clubs of major sports such as football, basketball, cricket, or field hockey, which usually have the necessary management skills to plan and implement an effective marketing strategy (Ginesta, 2020).

However, the submerged part of the iceberg comprises semi-professionalized or amateur organizations. The majority of sports clubs are amateur organizations, managed by volunteers that lack the time, resources, and qualified personnel to properly manage their marketing activity in general, and digital communication in particular (Marthinus, Duffett & Knott, 2024). The lack of adequate marketing resources and capabilities is detrimental to their financial results and, therefore, their sporting and social performance (Thiel & Mayer, 2009; Misener & Doherty, 2009).

Currently, sports and sports clubs, beyond their main function of offering sporting activities, are expected to contribute to solving various social problems related to public health, education, social cohesion, and promotion of values (Ivašković, 2024). But while high expectations are placed on them, a large part of the small and medium-sized clubs suffer difficulties; for example, in attracting and retaining players and volunteers, or facing competition from new sports and leisure offers (Coma Bau, 2024). In addition, the financial situation of clubs tends to be precarious, and many clubs lack adequate facilities (Seippel *et al.*, 2020).

Hence, with the goal of doing our bit, the objective of this study is to develop an affordable system to analyze and visualize the results of social media communications for non-professional sports clubs. Specifically:

- To select a set of key performance indicators (KPIs) that are easy and inexpensive to measure.
- To develop a simple procedure to export the selected KPIs from social media platforms to Microsoft Power BI.
- To design a dashboard for monitoring the social media communications.
- To assess the utility of the monitoring system by applying it to a non-professional sports club.

1.3. Club Patí Voltregà

In Catalonia, associations within the sports system have a long-standing tradition and their significance is widely acknowledged. Sports clubs are an important agent

for sports promotion – both in terms of leisure and competition – with the Catalan sports system (Viñas & Pérez, 2010; Marquès & Viñas, 2016).

Rink hockey is a deeply rooted sport in Catalonia, particularly in the region of Osona. In fact, Catalonia is a world power in this sport. Due to the characteristics of the game, such as speed, precision and forcefulness (Trabal *et al.*, 2023), hockey games usually offer a very attractive spectacle. This study is based on the hypothesis that the economic results and social implementation of hockey clubs are far below their potential to maximize the (economic and sporting) performance of the spectacle they generate.

To assess the usefulness of the monitoring system proposed in this study, it is applied to the case of Club Patí Voltregà (CP Voltregà), a non-professional rink hockey club located in Sant Hipòlit de Voltregà, a little town in the northwest of Spain (0.97 square kilometres, 3,711 inhabitants). The club was founded in 1955 by Victoriano Oliveras de la Riva, a textile industry businessman (Casas Trabal, 2006). Since then, the club has always played in the top categories of the Spanish leagues. The track record of CP Voltregà's female first team includes six European leagues, five Spanish leagues, and six national cups, while the male team has won three European leagues, two European cups, three national leagues, and five national cups.

But the main strength of the club resides in its training capacity. Many top-level players have been trained in the club's youth academy. Currently, 216 children and teenagers play at the club's school in 27 teams, including a floorball team made up of individuals with intellectual disabilities. Another remarkable strength of the club is the inextricable link between the club and the town. Indeed, the club's facilities are the main rendezvous where locals of all ages socialize, especially CP Voltregà's fandom supporter group, called *Sac i Ganxo*.

In this analysis, we examine key metrics for the club's official social media accounts on three platforms – X, formerly known as X (<https://x.com/cpvoltrega>); Facebook (<https://www.facebook.com/cpvoltrega>); and Instagram (<https://www.instagram.com/cpvoltrega>) – as well as its website (<https://www.cpvoltrega.com>). Currently, the official name of the club includes the name of its main sponsor, a Mercedes-Benz car dealership: Club Patí Voltregà-Movento Stern. On Instagram, the club has several specialized secondary accounts that have not been considered in this study: *@escola_voltrega* (academy), *@cpvoltregafemeni* (female team), and *@campusvoltrega* (youth holidays intensive trainings). The community managers are two voluntary non-professional members of the board of directors, aided by occasional volunteers.

Following this introduction, in the methodology section we detail the proposed procedure for selecting, extracting, analyzing, and visually representing the results of social media communications for non-professional sports clubs. To assess the effectiveness of this monitoring system, we then present the results of its application to the amateur rink hockey sports club CP Voltregà. Finally, we discuss the findings and draw some conclusions.

2. Methodology

2.1. Social media key performance indicators

A review of several publications in the professional field that deal with the measurement and monitoring of results achieved on social networks was carried out (Anoz, 2022; Hill, 2023; IAB Spain, 2022; Macready, 2024; Team Asana, 2024; Tejedor, Cervia, & Vecino, 2020; Sheikh, 2024). The various publications identify, define, classify, and recommend different metrics to be monitored, or KPIs. From this review, up to 69 metrics were detected from four of the main social networks: X, Facebook, Instagram, and websites. Few exact matches were found among the publications: of the 69 metrics, only two were included in six publications; two metrics in five publications; three metrics in four publications; three other metrics in three publications; sixteen metrics in two publications; and 43 metrics were mentioned in a single publication.

From the examination of the 69 detected metrics, it was observed that a large portion of them were based on the same basic concept but measured differently. For example, the number of impressions reached by an Instagram post can be measured in total terms or over specific periods, such as days, months, etc. By simplifying the set of metrics according to the common basic concepts they measured, the number of metrics considered could be reduced from the initial 69 to 32 basic metrics.

Table 1 shows the set of 32 basic metrics. It indicates the name (and abbreviation, if applicable) and description of each metric, and the number of other metrics it groups together from the initial 69. Additionally, in the last column of Table 1, it is specified whether a professional paid tool is needed to obtain the metric in question, or whether it is possible to obtain it free of charge based on the reports that account holders can download from the respective platforms.

Unique metric	Description	Aggregated metrics	Source
Bounce rate	Number of users who visit the website from another environment but leave without following the link	1	Professional tools
Conversion metrics	Making a purchase, downloading a resource, signing up for a newsletter, attending a webinar, visiting a specific webpage, participating in a contest, signing up for a demo	1	Professional tools
Conversion rate	Number of conversions divided by number of clicks	1	Professional tools
CPC (cost per click)	Investment amount divided by each click on an ad	1	Professional tools

Table 1. Basic metrics

Source: Own work.

Unique metric	Description	Aggregated metrics	Source
CPM (cost per thousand impressions)	Investment amount divided by a thousand impressions	1	Professional tools
CSAT (customer satisfaction score)	Customer satisfaction rating (question with scale values)	1	Professional tools
CTR (click-through rate) impressions	Number of clicks a post receives divided by the number of impressions	1	Professional tools
CTR (click-through rate) reach	Number of clicks divided by reach (in some cases, by impression)	1	Professional tools
Demographic profile	Demographic data of followers	1	Private accessible
Efficiency	Number of interactions divided by number of posts	6	Private accessible
Engagement	Number of total reactions	12	Private accessible
Engagement rate	Number of engagements divided by number of followers	2	Private accessible
Follower growth rate	Growth in number of followers	1	Professional tools
Followers	Number of followers	2	Public
Following	Number of profiles followed	1	Public
Hashtag usage	Use of hashtags	3	Professional tools
Impressions	Number of times content has been shown. Includes video views	7	Private accessible
Impressions rate per follower	Number of impressions divided by followers	1	Private accessible
Impressions rate per reach	Number of impressions divided by reach	1	Private accessible
Mentions	Total number of references made to the brand	1	Professional tools
Negative feedback	Number of negative actions against the content	1	Professional tools
NPS (net promoter score)	Scale of responses to the question "How likely are you to recommend our [company/product/service] to a friend?"	1	Professional tools
Participation rate	Number of engagements divided by reach	1	Private accessible

Table 1. Basic metrics (continued)*Source: Own work.*

Unique metric		Description	Aggregated metrics	Source
Posts	Number of posts		6	Private accessible
Reach	Number of people who have seen a content		4	Private accessible
Reach rate per follower	Reach divided by number of followers		1	Private accessible
Referral traffic	Number of people visiting the website without going through a search engine		1	Private accessible
Response time	Response time of the team to requests expressed on social media		1	Professional tools
Social sentiment	Measure of the sentiment of conversations about the brand on the network		1	Professional tools
SSoV (social share of voice)	Number of people talking about the brand on social media divided by all mentions in the sector, multiplied by 100		2	Professional tools
Virality rate per follower	Number of shares divided by number of followers		3	Private accessible
Virality rate per impression	Number of shares divided by number of impressions		1	Private accessible
Total			69	

Table 1. Basic metrics (continued)*Source: Own work.*

2.2. Data selection and extraction

Of the 32 metrics obtained (Table 1), 16 metrics from X, Facebook, Instagram, and websites were selected, which can be obtained for free by the respective account holders. To simplify the task of monitoring the metrics in the case study of CP Voltregà, from the 16 metrics, those that were not available on all four platforms were not included, i.e. demographic profile, referral traffic, and virality rates. Additionally, some metrics were prioritized in the study: reach (R) on social media (the number of people who have seen a post) was equated to the value of users on the website, and for the concept of impressions on the website, the views metric was used, as these are the most similar data.

Finally, although they are not strictly metrics, two additional variables were selected: the date and the text of each publication. The text contained in the publications was necessary to classify them later according to their topic. In total, nine metrics were selected for the CP Voltregà case study.

These available data were extracted in three ways. First, most metrics were downloaded directly into a spreadsheet from the tracking tools offered by the platforms themselves. These directly obtained metrics were: engagement (E),

number of impressions (I), number of publications (P), publication date, and publication text (except in the case of the website, where it had to be collected manually).

Secondly, two variables were manually extracted: the number of followers (F) and the text of the posts published on the website, which were public data in the accounts' profiles. And thirdly, some metrics had to be calculated from the combination of other directly obtained metrics. For example, efficiency is the result of dividing engagement (E) by the number of posts (P): E/P . Thus, efficiency, engagement rate, and participation rate were calculated.

In summary, for each of the 16 available metrics, Table 2 indicates the platforms on which the metric is available (X, Facebook, Instagram, and/or the website), the way in which the metric was obtained (extracted directly from the

Metric	X	Facebook	Instagram	Web	Directly extracted	Manually collected	Calculated	Included
Demographic profile	No	Yes	Yes	Yes	X			No
Efficiency	Yes	Yes	Yes	No			E/P	Yes
Engagements (E)	Yes	Yes	Yes	No	X			Yes
Engagement rate	Yes	Yes	Yes	No			E/F	Yes
Followers (F)	Yes	Yes	Yes	No		X		Yes
Following	Yes	Yes	Yes	No		X		No
Impressions (I)	Yes	Yes	Yes	Views	X			Yes
Impressions rate per follower	Yes	Yes	Yes	No			I/F	No
Impressions rate per reach	Yes	Yes	Yes	No			I/R	No
Participation rate	Yes	Yes	Yes	No			E/R	Yes
Posts (P)	Yes	Yes	Yes	Yes	X			Yes
Publication date	Yes	Yes	Yes	Yes	X			Yes
Reach (R)	Yes	Yes	Yes	Users	X			No
Reach rate per follower	Yes	Yes	Yes	No			R/F	No
Referral traffic	No	No	Yes	Yes	X			No
Text	Yes	Yes	Yes	Yes	X (except web)	X (web)		Yes
Virality rate per follower	Yes	Yes	No	No			$E(c)/F$	No
Virality rate per impression	Yes	Yes	No	No			$E(c)/I$	No

Table 2. Freely available metrics

Source: Own work.

spreadsheet, calculated, or collected), and whether or not the metric was included in the application of the study to the case of CP Voltregà.

The definitions of the nine metrics selected for the CP Voltregà study (Table 2) are as follows (IAB Spain, 2022; Macready, 2024; Sheikh, 2024; Team Asana, 2024):

1. Posts (P): number of published posts.
2. Engagements (E): number of engagements received by a post (interactions, i.e. likes, comments, shares).
3. Efficiency: number of engagements divided by the number of posts.
4. Followers (F): number of followers.
5. Engagement rate (E/F): number of engagements divided by the number of followers.
6. Impressions (I): number of times a post is seen. Impressions indicates how many individual times a post has been viewed.
7. Participation rate: number of engagements divided by the number of people who have seen a post (reach). It can be a more precise metric than the engagement rate because it includes non-followers who may have seen the post due to hashtags or shares.
8. Publication date: the date when a post was published.
9. Text: content of a post.

2.3. Data preparation, analysis, and representation

With the aim of monitoring the nine metrics included in the study of CP Voltregà, firstly the time interval to be analyzed was limited to the period between October 1, 2022 and December 31, 2023, ensuring that at least a full season of rink hockey competitions in Spain was covered. Then, the data extracted directly from the platforms and the data collected were organized into a single spreadsheet, consolidating all the data from the club's publications into one document. Next, the spreadsheet was completed with the columns corresponding to the platforms of origin of the publications and the metrics calculated from the combination of other directly obtained metrics.

Then, the publications were classified according to thematic topics. All publications were categorized into three main topics (general news, match, and team) and their respective subtopics. Additionally, publications referring to specific competitions were classified under the respective competition. The resulting categories were as follows:

- News: club, intensive training, pairing, condolence, ticket sales, becoming a member, kits, and sponsor.
- Match: agenda, results, goals and plays, broadcast announcement, live match posting, kick-off, travel.
- Team: contract renewal, new male player, player, player leave, new female player.

— Competition: Parlem OK Liga, WSE Cup, OK Liga Iberdrola, Escola, Nacional Catalana Femení; Copa del Rey, Parlem OK Liga and OK Liga Iberdrola, GoldenCat, Nacional Catalana Masculí and Nacional Catalana Femení, GoldenCat Femenina, GoldenCat Masculina, Copa Catalana Femenina, Nacional Catalana Masculí.

To analyze and graphically represent the nine metrics included in the study of CP Voltregà disaggregated by platforms, months, topics, and subtopics, corresponding graphs were generated separately using dynamic tables in Microsoft Excel. They were organized according to the metric to be displayed: number of publications, impressions, etc. However, this approach resulted in over 50 potential graphs and did not facilitate comparative observations. Therefore, we decided to use reports generated with Microsoft Power BI. This allowed us to create reports categorized by dimensions such as months, topics, and subtopics, with filters for platforms including X, Facebook, Instagram, and the website. In total, 31 interactive graphs were generated, each displaying metrics with counters. The main reports generated with these charts are shown in the results section.

2.4. Data selection, extraction, analysis, and representation of OK Liga clubs

The first men's and women's teams of CP Voltregà compete in the top Spanish leagues: Parlem OK Liga and Liga Iberdrola, respectively. With the aim of comparing CP Voltregà's performance on social networks with that of rival clubs, seven metrics were selected that can be obtained for free from eight social networks. Table 3 shows the metrics available on the public profiles of the clubs' official accounts. As of January 30, 2024, the values for these metrics were manually collected. Subsequently, a spreadsheet was created with the metrics, from which comparative tables and graphs shown in the results section were generated.

	Web	X	Facebook	Instagram	YouTube	TikTok	Twitch	Spotify	Flickr
Name / URL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Join date		Yes							Yes
Followers / subscribers		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Following		Yes	Yes	Yes		Yes			Yes
Posts		Yes		Yes	Yes			Yes	Yes
Page likes			Yes			Yes			
Comments			Yes						

Table 3. Selected metrics of OK Liga clubs

Source: Own work.

In short, Figure 1 summarizes the procedure followed in this study to monitor the social networks of CP Voltregà, which can be replicated by any other non-professional sports club.

Obtaining data		Club	Other clubs
Platform spreadsheet		For each publication: content (except web), engagement, impressions, publication date	
Collected		Followers, web content	For each existing platform: followers, following, likes, publications
Calculated		Efficiency, engagement rate, participation rate	
Categorize content		Topic, subtopic and competition	
Single document		Table posts	Table clubs
Building the reports		Global data, by month, by topic, by subtopic	Global data, followers-following-likes by platform, followers-posts number by platform

Figure 1. Summary of the procedure for monitoring social media of non-professional sports clubs

Source: Own work.

3. Results

In this section, we examine key metrics for the club’s official social media accounts on three platforms: X, Facebook, and Instagram, as well as its website. Firstly, we analyze the club’s results in isolation, and secondly, we compare some of the club’s metrics to those of its rivals.

3.1. Club Patí Voltregà social media metrics

The results of the social media metrics for CP Voltregà are presented both as an aggregate for the entire study period and broken down by platform (Figure 2). These platforms are critical channels for digital engagement, each with a distinct user base and characteristics. The X account was initiated on May 2, 2009. On December 24, 2023, it had 6,522 followers, both individuals and entities interested in the platform’s dynamic content. The Club had shared 10,100 publications on X during its operational period, demonstrating the platform’s active user engagement and diverse content offerings. During the 15 months analyzed, the club published 298 posts on X and generated 5,570,700 impressions. The engagement rate, calculated as number of engagements divided by the number of followers, was 15.73. Furthermore, the platform had high engagement, with 305,630 interactions and an efficiency rate of 1,026 interactions per post.

The Facebook account was created on December 9, 2010. With a community of 3,600 followers, Facebook maintains a strong presence among its users. The platform had seen a significant volume of 3,427 publications, indicating the

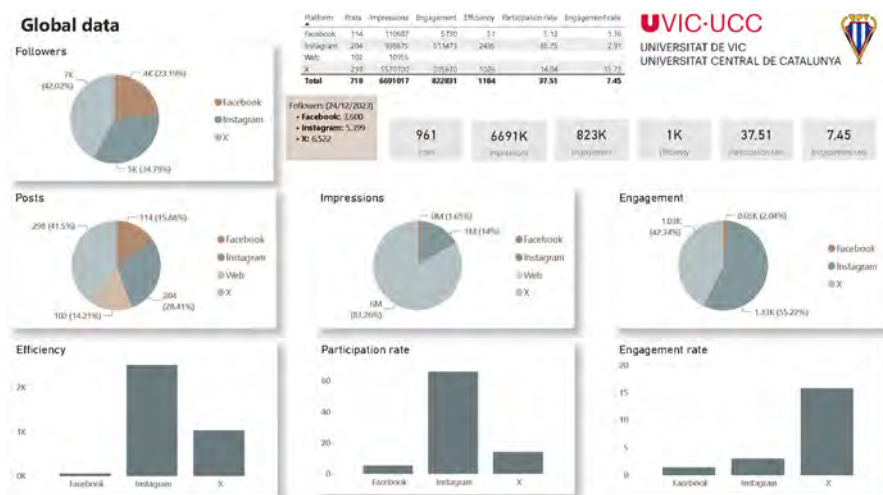


Figure 2. Club Patí Voltregà social media metrics by platforms

Source: Own work.

continuous flow of content and conversations taking place within the Facebook ecosystem. Between October 1, 2022 and December 31, 2023, the club published 114 posts on Facebook, and generated 110,687 impressions. With 5,730 interactions and an efficiency rate of 51 interactions per post, the platform maintained a consistent level of engagement regarding its audience size. The engagement rate was 1.36 interactions-per follower.

The Instagram account was set up on February 3, 2014. On 24 December 2023, it had 5,399 followers and had created a vibrant ecosystem in which users could engage with captivating imagery and creative content. Despite its relatively short operational history compared to X and Facebook, Instagram had seen a significant number of publications (844), demonstrating the platform's effectiveness in facilitating visual communication and expression. With 204 publications during the analyzed period, Instagram received a significant number of impressions, totalling 998,675. The platform led in engagement, with 511,471 interactions and an efficiency of 2,495 interactions per post. The engagement rate was relatively higher, at 2.91, indicating a high level of user interaction among followers.

Finally, the web platform's community size is not provided because it has no followers. However, with 102 publications and 10,955 impressions during the analyzed period, the platform had a small but significant presence in the digital space.

Comparatively, Instagram had the largest community size among the platforms analyzed, followed closely by X and Facebook; the web platform's number of followers was not a meaningful metric. X had the highest publication frequency, followed by Instagram, Facebook, and the web. In general, the metrics were lower

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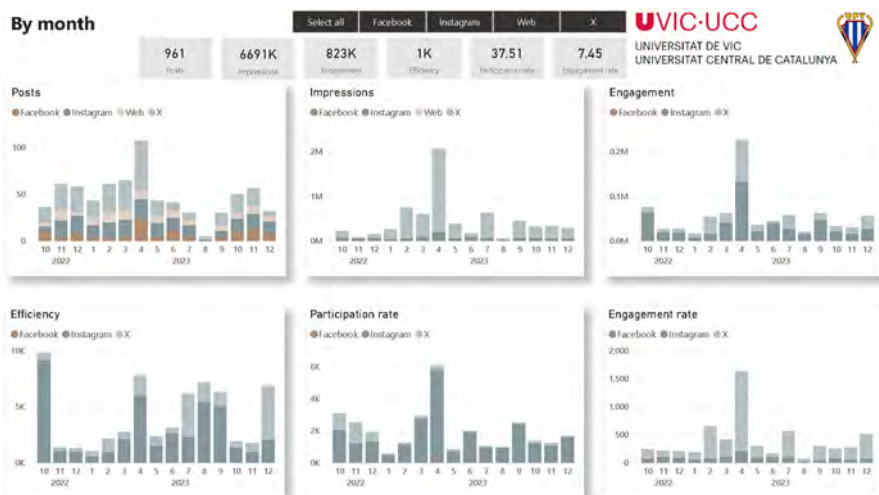


Figure 3. Club Patí Voltregà social media metrics over time

Source: Own work.

for Facebook than for X and Instagram, including the number of posts. Instagram had the highest efficiency in generating interactions per post, indicating a very active user base; X also showed a high engagement rate but participation rate was much lower. With similar values for followers and posts, the number of impressions was higher for X (the club was viewed more on this platform), and the engagement values were higher for Instagram (people who viewed the club on Instagram interacted more with the content).

A comprehensive analysis of social media metrics for CP Voltregà was carried out, segmented by month. Figure 3 includes six bar charts detailing posts, impressions, engagement, efficiency, participation rate, and engagement rate across Facebook, Instagram, and X, while only posts and impressions for the website. The top section provides aggregated data: 961 posts, 6.691 million impressions, 823,000 engagements, an efficiency score of 1 million, a participation rate of 37.51, and an engagement rate of 7.45.

The posts chart displays the monthly total of posts, with a noteworthy peak in April, 2023. The increased activity in April was due to the contest (and the team's victory) in the World Skate Europe Cup final. In August, on the contrary, few posts were published due to the vacation period. The impressions chart shows, again, a notable spike in views in April 2023, especially on X; to some extent, the increase in views might be due to the increase in posts. In general, every month the number of impressions were much higher for X than for Instagram, particularly in April 2023.

April 2023 again stood out as having the highest numbers for engagement, due in part also to the increase in posts. In terms of monthly engagement,



Figure 4. Club Patí Voltregà's social media metrics by topics

Source: Own work.

Instagram and X showed quite similar values, while Facebook's were almost imperceptible. Instagram was the top platform in April 2023 based on efficiency, which is the ratio of engagement to posts; Facebook, again, showed the lowest efficiency. Sometimes, the increase in efficiency was due to specific "viral" posts. For instance, in October 2022, the repost of a post dedicated to CP Voltregà, published by the influencer Spursito (@martimiras), received 8,540 engagements on X and 40,769 on Instagram, that rocketed the efficiency that month.

The publications were segmented by the main topics (Match, News, and Team) and the metrics of the studied social networks were obtained (Figure 4). In total, 773 posts were found, resulting in 6,399K impressions, 495K engagements, 1K efficiency, 13.36% participation rate, and 9.59% engagement rate. The Match, News, and Team categories got around 450, 200, and 100 posts, respectively. The largest number of impressions, around 4M, came from the Match category, mostly from X.

Regarding engagement, the Match and News categories achieved similar results, both receiving close to 200K engagements, while the Team category got about 100k. Regarding efficiency, it is remarkable that Team was the topic with the highest number of engagements per post, which could indicate that it generates more interest than the other topics. As regards participation and engagement rates, the Match topic received the highest metrics, possibly because it was the most frequently published topic.

CP Voltregà's social media metrics were analyzed by segmenting the publications into subtopics (Figure 5). Overall, the most frequently published subtopics were Agenda, Results, and Goals and Plays (match summaries). Within the News

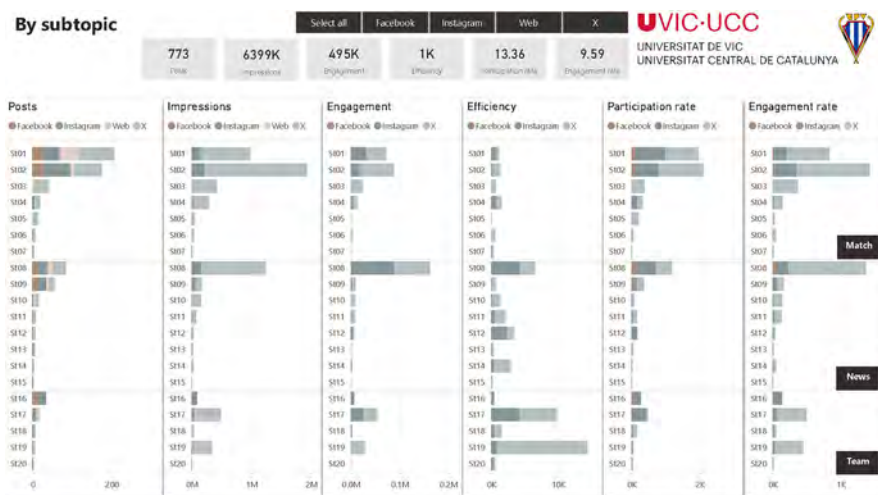


Figure 5. Club Patí Voltregà social media metrics by subtopics

TOPIC: MATCH. Subtopics: St01: Agenda; St02: Results; St03: Goals and Plays; St04: Broadcast Announcement; St05: Live Match Posting; St06: Kick-off; St07: Travel. | **TOPIC: NEWS.** Subtopics: St08: About the Club; St09: Intensive Training; St10: Pairing; St11: Condolence; St12: Ticket Sales; St13: Become a Member; St14: Kits; St15: Sponsor. | **TOPIC: TEAM.** Subtopics: St16: Contract Renewal; St17: New Male Player; St18: Player; St19: Player Leave; St20: New Female Player.
Source: Own work.

topic, the most published subtopic was About the Club, and within the Team topic, Contract Renewal. The subtopics Player Leave and New Male Player showed high metrics in number of impressions, number of engagements, efficiency and engagement rate, despite not having a high number of posts. This demonstrates the significant interest generated by these subtopics. In general, all subtopic metrics were higher for X than for Instagram, except for the number of posts, which were similar.

Additionally, the social media KPIs of CP Voltregà were broken down by competitions (Figure 6). There were distinct differences both across competitions and platforms. In general, the Parlem OK Liga and WSE Cup competitions, with frequent posting, showed the highest metrics. Additionally, the number of posts published on X for the three main competitions (Parlem OK Liga, WSE Cup, and OK Liga Iberdrola) exceeded those for the other competitions. On some platforms, no posts were published about certain competitions, such as the club's school, likely because it has its own Instagram account.

Remarkably, some competitions with a low number of posts and impressions showed high levels of engagement. In this way, the GoldenCat, Male GoldenCat, Copa Catalana Femenina, and Nacional Catalana Masculí competitions achieved a high level of efficiency, i.e. a high number of engagements relative to the number of posts.

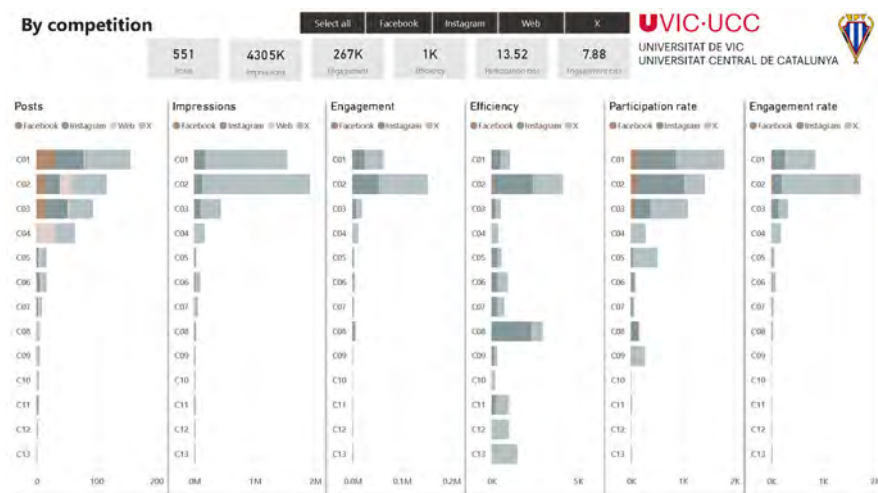


Figure 6. Club Patí Voltregà social media metrics by competitions

C01: Parlem OK Liga; C02: WSE Cup (CERS); C03: OK Liga Iberdrola; C04: Escola; C05: Nacional Catalana Femeni; C06: Copa de Rey; C07: Parlem OK Liga and OK Liga Iberdrola; C08: GoldenCat; C09: Nacional Catalana Masculi and Nacional Catalana Femeni; C10: GoldenCat Femenina; C11: GoldenCat Masculina; C12: Copa Catalana Fem; C13: Nacional Catalana Masculi.

Source: Own work.

3.2. OK Liga clubs' comparative metrics

Information was collected about which digital media platforms are used by the 28 clubs of the major male and female Spanish rink hockey leagues: Parlem OK Liga and Liga Iberdrola, respectively (Figure 7). Almost all clubs have official accounts on Instagram, X, and Facebook. Around 70% of the clubs have an official website, and approximately 40% have a YouTube account. Only a few clubs have official profiles on TikTok, Twitch, Flickr, or Spotify. Hence, the four social media platforms used by CP Voltregà coincide with the most frequently used platforms by most clubs.

The community share bar chart (Figure 7) shows the percentage distribution of followers across social media platforms. For almost all clubs, Instagram represents the main source of followers. In general, X accounts are the second most important origin of subscribers. Thirdly, Facebook still represents an important source of followers. On the other hand, the number of followers coming through TikTok, Twitch, Flickr, and Spotify is minimal. For its part, CP Voltregà's community of followers is quite evenly distributed across Instagram, X, and Facebook.

FC Barcelona stands apart from the rest of the clubs in several ways. Its rink hockey section emerges as the most followed club. In fact, more than half of the OK Liga clubs' followers on Instagram, X, and Facebook are Barça followers. Additionally, FC Barcelona is the only club with a Spotify account. It is also one of six clubs with a TikTok account, totalling 32,400 of the 33,008 followers on this plat-

Global data

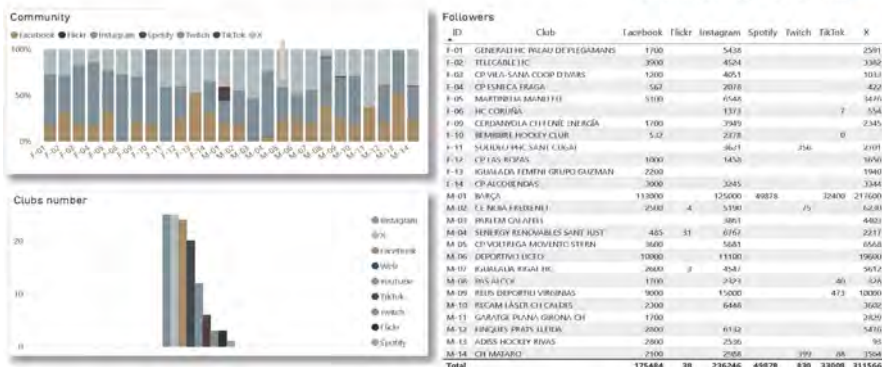


Figure 7. OK Liga clubs' social media platforms

Source: Own work.

form. The FC Barcelona rink hockey section constitutes a peculiar organization within the Spanish rink hockey scene. It is allegedly the only fully professionalized club.

Finally, six bar charts were created displaying data on followers, following, and posts for OK Liga clubs across X, Instagram, and Facebook, as well as Facebook likes (Figure 8). In these charts, follower counts are represented by bars, while following counts are depicted by line graphs. CP Voltregà is marked by an arrow. Notably, there is no apparent regularity in the followers-to-following ratio. On X, some clubs exhibit a relatively high ratio, including Martinelia Manlleu, Igualada Rigat HC, Reus Deportiu Virginias, and Recam Làser CH Caldes. Conversely, others have a relatively low ratio, such as Igualada Femení Grupo Guzmán, CP Vila-sana Coop. d'Ivars, and CP Esneca Fraga. FC Barcelona is excluded from the bar charts due to its extreme values, which could obscure the magnitudes of other clubs. Similarly, Deportivo Liceo is also excluded. FC Barcelona has the highest followers-to-following and followers-to-posts ratios. These ratios for CP Voltregà are moderately high.

4. Discussion and conclusions

The aim of the study was to provide a tool for non-professional sports clubs to use for social media communication analysis and visualization. The first specific objective was to select a set of KPIs that are easy and inexpensive to measure. We identified up to 69 possible metrics that can be monitored using professional paid tools

Followers - Following - Likes

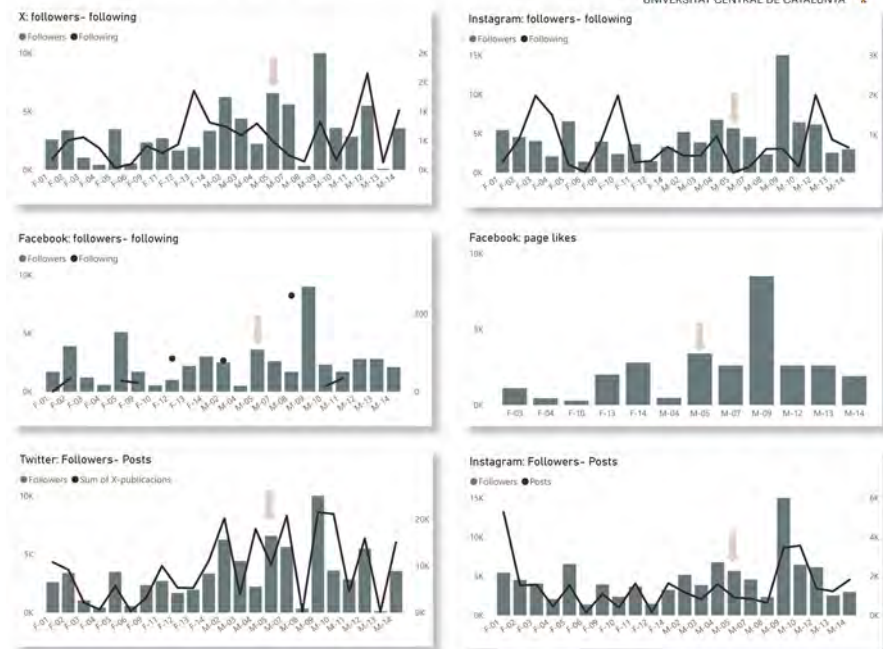


Figure 8. Followers, following, posts and Facebook likes of OK Liga clubs

(FEMALE) LIGA IBERDROLA: F-01: Generali HC Palau de Plegamans; F-02: Telecable HC; F-03: CP Vila-sana Coop. d'Ivars; F-04: CP Esneca Fraga; F-05: Martinelia Manlleu; F-06: HC Coruña; F-09: Cerdanyola CH Fenie Energia; F-11: Solideo PHC Sant Cugat; F-12: CP Las Rozas; F-13: Igualada Femení Grupo Guzmán; F-14: CP Alcobendas. | (MALE) PARLEM OK LIGA: M-01: FC Barcelona; M-02: CE Noia Freixenet; M-03: Parlem Calafell; M-04: Senergy Renovables Sant Just; M-05: CP Voltregà Movento Stern; M-06: Deportivo Liceo; M-07: Igualada Rigat HC; M-08: PAS Alcoi; M-09: Reus Deportiu Virginias; M-10: Recam Làser CH Caldes; M-11: Garatge Plana Girona CH; M-12: Finques Prats Lleida; M-13: Adiss Hockey Rivas; M-14: CH Mataró.

Source: Own work.

from the most common social media platforms: X, Facebook, Instagram, and the clubs' websites. Then, we synthesized these 69 metrics into 32 basic metrics according to the common underlying concepts they measure. Of the 32 basic metrics, we selected the 16 metrics that are freely available on the four social media platforms. This prioritization highlights the importance of employing relevant and easily available indicators to maintain the monitoring system controlled and helpful for non-professional groups.

The subsequent objectives were to develop a simple procedure to export the selected KPIs from social media platforms and to design a dashboard for monitoring social media communications. To achieve this, we presented a procedure to extract tweets, posts, and entries published over an entire season by a non-professional club and created a dashboard using Microsoft Power BI to graphically

represent the selected nine key metrics. The dashboard's nine metrics offer a comprehensive yet focused picture of social media performance, including followers, posting frequency, impressions, engagements (likes, shares, comments), efficiency, participation rate and engagement rate. The resulting dashboard provides an overview of the club's metrics, broken down by social media platforms, months, topics, subtopics, and competitions.

The last objective was to assess the utility of the proposed monitoring system by applying it to a non-professional sports club. By focusing on CP Voltregà, an amateur rink hockey team, the study demonstrated the effectiveness and relevance of social media analytics for amateur sports associations. Significant findings and implications were derived from this application.

Comparing the platforms of CP Voltregà, it was found that Instagram has the largest community size, while X has the highest publication frequency. In general, the metrics are lower for Facebook than for Instagram and X. Instagram has the highest efficiency in generating interactions per post, while X shows a high engagement rate. With similar values for followers and posts, the number of impressions is higher for X, and the engagement values are higher for Instagram. The study showed that audience involvement and engagement levels vary across different social media platforms. Because it is a visual platform, Instagram may have greater engagement rates, while X may benefit from real-time conversation. By having a complete understanding of platform-specific characteristics, clubs can focus on their content and strategies to improve engagement and reach.

Metrics are divided on the basis of months, topics, subtopics, and competitions to provide richer details about the content that audiences are most interested in and when. This can help the club plan its posting schedule and focus on creating content that encourages more interaction. For instance, in April 2023, there was a peak in all metrics due to the WSE Cup final. In August 2023, by contrast, few posts were published due to the vacation period. As expected, the degree of online activity on social media parallels the onsite sports activity in the club.

Regarding the thematic analysis, some very frequently posted subtopics were identified within the topic Match. This is understandable, as these are recurring events, like the weekly agenda, the weekend results, and the best goals and plays of the match day. However, the club should also be aware that there are some less frequently posted topics that raised a lot of attention and engagement, namely the subtopics Player Leave and New Male Player within the Team topic. Similarly, there were some competitions that created high awareness and interaction despite not being the most frequently published, such as GoldenCat, Nacional Catalana Femení, and Nacional Catalana Masculí.

Additionally, a performance benchmark was obtained by comparing CP Voltregà's stats with those of other teams in the OK Liga: we selected, collected, and visually represented publicly available metrics of the club's rivals in the male and female Spanish major leagues (OK Liga). This benchmarking enabled a

comparison of social media performance with rival clubs, highlighting some of the club's strengths and weaknesses and offering practical advice for development. This competitive analysis can assist the club in understanding the industry and implementing best practices from successful competitors.

The study highlights the particular difficulties that amateur clubs encounter, including fewer resources and volunteer-run administration. The created system attempts to lessen these difficulties by providing an affordable and easy-to-use social media monitoring solution. The results indicate that, despite the above-mentioned limitations, non-professional clubs can achieve significant engagement and brand promotion by using social media strategically.

The study presents several limitations that suggest potential future lines of research. Firstly, some social media metrics that have not been included in this study could be analyzed, such as measuring of website performance. Secondly, other types of publications and content could be monitored, such as stories, reels, hashtags, and mentions. Particularly promising is a study on how sports clubs mention and tag sponsors and other stakeholders in their posts. Thirdly, adopting an action research approach proposing, agreeing upon, and implementing measures in a club's digital communication practices, and monitoring the results, would provide fruitful and valid insights into sports social media management best practices. Fourthly, another potential line of investigation could focus on examining the coherence between the club's digital communication practices and its overall marketing strategy. Finally, to enhance the applicability of the proposed system, additional examples of its implementation in other clubs and sports could be included in future studies. ■

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