# Digital and Social Media in Pro Sports: Analysis of the 2013 UEFA Top Four

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## Abstract

*Just like other businesses, so do professional sports teams use multi-functional websites and other online vehicles to connect to their audiences providing news, match day information, player statistics, and shopping opportunities among others. However, with the rapidly grown popularity of social media and mobile computing, the service expectations and functional requirements for digital online presence and interaction have also changed.*

*We studied the characteristics of the 2013 UEFA top four football teams' online appearance, that is, the mix of official team websites and their social media and mobile applications. By building on past studies that had explored professional team websites by using the TEDS framework for information artifact evaluation, this investigation replicated the same 'human agent-centric' approach, but also included in the study the teams' social media and mobile channels. The results suggest that the official websites of the 2013 top-four UEFA teams have slightly improved over time. However, the official team websites have lost importance relative to social media and mobile channels.*

## 1. Introduction

Around the world the top professional sports teams have morphed into medium-size businesses, some with over half a billion dollars in revenues each year [1]. One interface to their respective audiences and customer bases, professional sports teams run multi-functional websites that provide transactional functionality (for example, online sales of merchandise and ticketing) as well as a whole host of informational functionality [1]. Traditionally, it was via team websites, through which professional sports teams created additional revenue within this rapidly expanding multi-billion dollar industry [2]. Also, for quite a few years the official team websites were the primary venue, through which a connection to fans and followers had been established. However, in an increasingly connected world, frequent online information updates and transactional offerings to various audiences have become the regular modus operandi [3]. While broadcasting and match day-related revenues still account for 73 percent of overall revenues, commercial revenues now account for 27 percent of the total [1]. An increasing fraction of the commercial revenues have been generated online through team websites and via resources linked to them. More recently, the team websites no longer stand alone as transactional means for online transactions with the professional teams.

The rise and success of mobile computing and of social media have had a profound effect on how and what professional sports teams offer their audiences and customer bases. Social networking sites such as Facebook, Twitter, and YouTube enable the teams to connect in novel ways with fans, followers, and the general public. Social media along with smart phone or tablet-based applications allow for conveying and exchanging information without middlemen in instant, direct, and ubiquitous ways, which were previously hard to make available via the traditional team websites.

The variety of devices (including mobile smart phones and tablets), which have become pervasive, is dramatically impacting the information and consumer-good buying behavior. In this study, we examined online presence and appearance of professional sport teams from an information perspective.

This research builds on Scholl and colleagues earlier work [4] [2] by also employing the TEDS framework for information artifact evaluation [4]. Like in the earlier studies the official websites of the 2013 top-four UEFA football teams were evaluated across seven of eight scenarios previously studied. Additionally, the scenarios of social media use and the mobile access scenarios were included in the investigation.

The purpose of this study was to determine and analyze the mix and state of online informational and transactional functionalities and choices as observable at the 2013 top-four UEFA soccer club, and to compare the findings with the findings from earlier studies, which had a focus on traditional websites.

The study shows how the official sports websites of the 2013 top-four UEFA teams have progressed over time (in comparison to Scholl and colleagues

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results [2]). Furthermore, it was found that the official websites are losing in importance relative to other online channels such as social media and other mobile applications. The fading attractiveness of the traditional websites relative to other online channels might represent a trend. At the very least, it highlights the role and growing importance of social media in online informational and transactional exchanges.

The structure of the paper is as follows. In section 2, a brief summary of the literature in this area of study is provided. Section 3 discusses the methodology, while section 4 presents the findings. Section 5 discusses the findings, the study's limitations, and the areas for improvement in the studied online team appearances. Finally, section 6 presents the conclusions and outlines future research avenues.

## 2. Literature Review

The rapid development of modern information technologies and their backbone, the Internet, in particular, have changed and greatly extended the look, feel, reach, modalities, and functions of information artifacts. Under the term "information artifact" a large array of its instantiations is summarized ranging from traditional and static ones such as books and newspapers to highly interactive, mobile, networked, and computer-mediated instantiations such as tablet applications, smart phones, ebooks, interactive websites and the like [2], which blur the border between content and technology instantiation [2][5]. For professional sports organizations interactive information artifacts that are accessible and executable over the Internet present an effective communication and marketing tool of growing importance [6]. In this context, information artifacts have been also evaluated from marketing and consumer perspectives [7][8]. For example, the *Motivation Scale for Sport Online Consumption* (MSSOC) framework presented by Seo and Green [6] has been used to measure the motives for using professional sport teams' websites as well as social media. Others introduced structural models to evaluate the sports websites quality as well as the interrelationship between "satisfaction" and "loyalty" of customers [9].

In contrast to these evaluative models focusing on the information perspective, Waters et al. [10] conducted a research study evaluating information artifacts from a communication point of view. In this study, it was found that the introduction and use of social media had become a prevalent trend in the practice of improving public relationships [10]. Also, professional sport organizations have effectively expanded their reach worldwide via channels such as their traditional websites as well as social media like Facebook, Twitter, and YouTube [5]. The social media channels provide an opportunity to post instant news, communicate with fans directly and stimulate the interaction between the organization and its followers, fans, and the general public. They also allow players to interact with their fan base and also foster fan collaboration and socializing around the teams' messages and postings. A recent evaluation of team websites and the Facebook pages of 26 National Football League teams encompassed 33 measures, which were divided into four categories, (1) reciprocity, (2) responsibility, (3) reporting, and (4) relationship nurturing [10] .

However, when compared to the analytical range and granularity provided by the TEDS framework [4], the framework used by Waters and colleagues appears to provide fewer analytical power. The TEDS framework [4] consists of six main analytical categories: (1) ease of use, (2) noise reduction, (3) quality, (4) adaptability, (5) performance, and (6) affection. Each main category is divided into more specific analytical sub-categories, in total 40 sub-categories across the six main categories.

The categories and sub-categories allow for a detailed analysis of traditional and modern, interactive information artifacts. The TEDS framework has been used to analyze the "actor- and utilization-specific evaluation of IS/IT artifacts" [4]. In particular, the TEDS framework has been used in a preceding study of professional sports team websites [2]. It can also be used in the analysis of social media and mobile information artifacts.

In summary, when comparing current models and research with regard to principles of analysis and evaluative methods for interactive information artifacts it becomes evident that (1) the evaluation of social media channels must be included when analyzing professional sports organizations; (2) multi-channel online marketing and multi-channel online customer relationship management are increasing in importance, also for professional sports teams; and (3) mobile applications for smart phones and tablets have become major informational and transactional channels for professional sports teams. Finally, the TEDS framework has the universality and provides the scope to cover these three additional areas of analysis with fine granularity.

## 3. Methodology

### 3.1. Research Questions

From the discourse in the preceding sections it follows that this research aims to answer the following three research questions:

Research Question #1 (RQ#1):

How have the traditional (official) websites of the top UEFA football teams improved (or, stagnated or declined) since the previous study [2]?

Research Question #2 (RQ#2):

What role do social media play, and how do they affect the overall mix of communication, information, and transaction channels for the top UEFA football teams?

Research Question #3 (RQ#3):

What role do mobile applications and devices play, and how do they affect the overall mix of communication, information, and transaction channels for the top UEFA football teams?

### 3.2. Sampling

The selection of the UEFA football teams followed a purposive sampling strategy [11] based on the following three selection criteria. First, we selected the semifinalists of the 2012/2013 UEFA Champions League season, which we here refer to as the top-four 2013 UEFA football teams. Since three teams (FC Barcelona, FC Bayern Munich, and Real Madrid) of the top four teams had repeatedly appeared in the semifinals of previous seasons, we reasoned that the best teams from a sportive perspective would also have high revenues from TV and other income sources. This in turn, we reasoned would possibly translate into at least high quality Internet appearances. With regard to the later 2013 finalist Borussia Dortmund from Germany that appeared among the top four for the first time after fifteen years, we reasoned that the back-to-back German champions with its largest average per-game attendance in Europe would in all likelihood also have the financial resources and a vested interest in reaching a large regional, if not global, audience via the Internet.

Second, the teams in the sample draw the highest public attention and enjoy support from some of the largest fan and follower bases. Third, the purpose of the study was it also to assess the changes, if any, or improvements on the traditional official team websites of FC Barcelona, FC Bayern Munich, Real Madrid, and Manchester United (as the anchor site) since the first study from three years earlier [2].

Manchester United was included to serve as a benchmark (also referred to as an anchor site in the TEDS context). In the earlier study, the site had been evaluated and ranked on top along with FC Barcelona [2]. Using it as the anchor site for this study, hence, appeared as a logical choice.

### 3.3. Data Collection

In contrast to the earlier study, in this research only seven of the original eight scenarios were used [2]: (1) team news, (2) player information, (3) schedules and results, (4) game videos & interviews, (5) leagues and other teams, (6) merchandise/store, and (7) ticketing. The eighth scenario "media download" could not be included in the analysis, since the majority of the sample teams did not provide this resource and service any longer. In addition to the aforementioned seven scenarios, four new scenarios for the analysis of social and mobile applications were included: (8) mobile access, (9) Facebook, (10) Twitter, and (11) YouTube.

The persona 'Casey' from Scholl and colleagues' [2] study, was again employed, to provide the opportunity for comparison: "A male or female, ages 16-60, a supporter, fan or follower, someone with average computer literacy and unrestricted access to the internet, interested in at least one professional sports team, accesses a professional sports team website occasionally to frequently, and purchased tickets or merchandise never or occasionally to regularly ([2] p. 412)."

Each sample team was rated by at least two raters. As before in the earlier study, a five point Likert scale of 1 (lowest) to 5 (highest) was employed to rate the following six categories: (1) ease of use, (2) noise reduction, (3) quality, (4) adaptability, (5) performance and (6) affection [4]. A score of 1 represented a very poor performance, a score of 2 a somewhat poor performance, a score of 3 would mark an average performance, a score of 4 would be used for a good performance, and a score of 5 would indicate very good performance. If in doubt, raters had the discretion to also use a fractional score of +/- 0.5 from the Likert value, for example, 2.5 for slightly less than average performance, which represents the midpoint between two Likert levels, in this case 2 (poor performance) and 3 (average performance).

Five raters conducted the rating independently. The raters' ages ranged from 20 to 25 years of age. They were all trained in conducting the evaluations along the lines of the TEDS framework; all were quite familiar with European football, in general, and the UEFA Champions League, in particular. All had extensive familiarity with and long exposure to functionality and uses of the Internet, in general, sports websites, mobile devices, and social media, in particular.

Raters were asked to browse the whole target website first to get an impression of its functionality, and then to rate one scenario at a time. While evaluating the information artifacts raters were required to record reasons for exceptionally poor or exceptionally strong performance by writing a comment and/or taking a screenshot. These quality assessments were used to provide extra information for the interpretation of scores and of overall research results as well as for the purpose of result illustration. When applying the TEDS procedure [4] the differences between raters are identified, discussed among raters, and, whenever possible, resolved to

reduce single-rater bias. Differences in ratings mostly occur due to diverging interpretations of the meaning of sub-categories. The discussion typically leads to an alignment of the interpretation of the meaning of a sub-category among raters, which then leads to more aligned scores upon re-rating. In a very small number of cases and despite a shared interpretation of meanings, raters arrive at ratings, which vary by more than 1.5 standard deviations. In such rare cases the results are flagged and interpreted with restraint, that is, the diverging evaluations are highlighted and considered.

In order to ensure the reliability and consistency of rating from the start, training sessions were held before the formal rating was launched. First, all raters went through all categories and sub-categories of the TEDS framework, one at a time, to make sure that all raters shared a similar understanding of the subcategory at hand, persona and scenarios.

Then, raters independently rated the anchor site, that is, Manchester United. In the earlier study, which had also used the TEDS framework, Scholl and colleagues [4] identified Manchester United's official website on a par with FC Barcelona's sites as the best among top European football teams (as of 2010). Therefore, for this research Manchester United's website was selected as the anchor/benchmark. Once each rater had individually completed the evaluation of the anchor site, a summary of descriptive statistics was calculated for each subcategory's scores. Using a standard deviation of 1.0 as a cutoff, subcategories with high variances were reviewed and discussed as described above. In this way, misunderstandings could be eliminated before the formal rating of the 2013 UEFA top four teams commenced. Once raters had a more aligned interpretation of the meaning of sub-categories, the results became highly consistent and reliable.

For the purpose of the mobile scenario in this project, the iPhone was selected, since it continues to hold the highest market share worldwide [12]. While other mobile platforms also host mobile applications for the sites chosen for evaluation in this study, we reasoned that the globally most widely proliferated platform (that is, the iPhone under iOS) would serve as a sufficient benchmark for the mobile scenario. For identifying and downloading the official mobile applications for each team, the Apple App Store http://www.apple.com/iphone/from-the-app-store/ was scanned. This resulted in the discovery and download of four apps for the five teams. Surprisingly, the anchor Manchester United was the only team that did not have an official application on the Apple App Store. The ratings in the mobile scenario, hence, had to be performed without an official app for the anchor site. Interestingly, this did not lead to higher than average variances in the ratings.

### 3.4. Data Analysis

As done during the training phase, for all four teams raters assigned values for each category and sub-category on a five-point Likert scale in each scenario. After collecting the raw data, the researcher team then flagged significant sub-category variances between raters by using a 1.0 standard deviation limit. Next, the researchers reviewed any significant variances, and used the aforementioned procedure also informed by the qualitative assessments such as notes and screenshots to reconcile the results. After the data was reconciled, per-team, per-category, and per-scenario analyses were conducted.

Beyond deriving the overall picture per area of analysis (team, category, and scenario), the research group was also highly interested in flagging exceptionally high or low scores, which would be subjected to further scrutiny. In general, such areas might serve either as high benchmark (extraordinary performance) or low benchmark (area of highest potential for improvement). Spider web charts (as shown in Figure 3) were then used to graphically represent the profile of each team's performance and illustrate how each website differed from one another.

## 4. Findings

In this section, first the overall results are presented per research question. This is followed by a per-team analysis of findings, which addresses each research question in more detail.

### 4.1. Addressing RQ#1 – Macro-level Findings

Ad RQ#1: *(How have the traditional (official) websites of the top UEFA football teams improved (or, stagnated or declined) since the previous study?)*

When comparing the differences in ratings for the 2013 UEFA Top Four (and the anchor) to the ratings for these teams in the 2010 Scholl and Carlson study [2], a few adjustments need to be considered. Due to differences in the study setup, a comparison of the overall ratings on average Likert level would not be appropriate. Not only does the Scholl and Carlson study use a higher number of sub-categories (44), that is, some sub-categories were exploded further for even more granular analysis, but the earlier study also covered an extra scenario (media downloads) [2]. Moreover, one team (Borussia Dortmund) was not included in the 2010 study. However, at relative rank level, the team websites can be compared to get an overall performance picture of how the websites have progressed over time relative to each other.

While in the earlier study, the websites of Manchester United and FC Barcelona shared first place, in this study only FC Barcelona came out first, while Manchester United dropped to third (after Real

Madrid). The two 2013 Champions League finalists (German clubs FC Bayern Munich and Borussia Dortmund) were ranked markedly lower than their competitors. In the case of FC Bayern Munich, the relative gap to FC Barcelona, Real Madrid as well as to Manchester United was not narrowed. In other words, the 2013 winner of the Champions League, FC Bayern Munich, continues to show a sub-par performance in the digital realm. Detailed results are shown in Table 1.

| Team | Official Website | Rank | Rank 2010 | Social Media | Rank | Mobile App | Rank |
|---|---|---|---|---|---|---|---|
| **Manchester United** *(anchor)* | 3.68 | 3 | 2 | 3.78 | 3 | 2.62 | 5 |
| **FC Bayern Munich** | 3.51 | 4 | 4 | 3.54 | 4 | 3.75 | 3 |
| **Borussia Dortmund** | 3.21 | 5 | Not in sample | 3.53 | 5 | 3.52 | 4 |
| **FC Barcelona** | 3.98 | 1 | 1 | 4.29 | 1 | 3.94 | 2 |
| **Real Madrid** | 3.75 | 2 | 3 | 3.88 | 2 | 4.20 | 1 |

**Table 1: Macro-level comparison of overall ratings for official websites, social media use, and mobile application support including website rankings from 2010** [2]

Overall, the official websites of the sample teams performed well with aggregate ratings in between 3 (average/neutral) and 4 (good). Actually, no team had a website with a total rating of less than 3.21 (Borussia Dortmund), which attests to the good and high quality of these traditional 2013 UEFA Top Four websites (see Figure 1 for further details).

## 4.2. Addressing RQ#2 and RQ#3 – Macro-level Findings

Ad RQ#2: *(What role do social media play, and how do they affect the overall mix of communication, information, and transaction channels for the top UEFA football teams?)*

When looking at the overall scores for the social media pages of the 2013 UEFA Top Four, it came as a surprise that these scores were relatively high with an average of 3.81 when compared to the average of 3.61 for traditional websites (excluding the anchor site). The lowest score for social media was also way higher (Borussia Dortmund, 3.53) than the lowest score for an official website (again, Borussia Dortmund, 3.21).

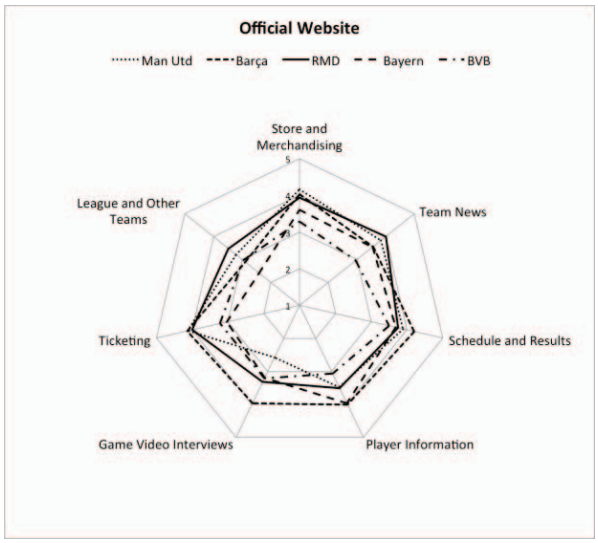


**Figure 1: Overall comparison of all official team websites (five point Likert scale)**

Ad RQ#3: *(What role do mobile applications and devices play, and how do they affect the overall mix of communication, information, and transaction channels for the top UEFA football teams?).*

The mobile application/access scenario also unveiled noteworthy results. Interestingly, neither Bayern Munich nor Borussia Dortmund referred to the respective official mobile apps on their websites. So, only a search of the Apple App Store let the researchers successfully find the official applications for these two members of the 2013 UEFA Top Four. In contrast, FC Barcelona and Real Madrid support mobile apps that scored quite highly and actually resemble one another significantly. These Spanish teams also refer to their official mobile apps on their websites. Curiously, for Manchester United, the researchers were unable to find any official app in the online app store [13]. Overall, with an average score of 3.85 for the 2013 UEFA Top Four the mobile application and access scenario outscored the other two scenarios in average scores (traditional official website average: 3.61/social media average: 3.81), see details in Table 1.

In summary, on an aggregate level of analysis, it appears that new media (social media and mobile apps) are more functional and attractive than the traditional websites of the respective professional 2013 UEFA Top Four teams. Further, the two Spanish teams (FC Barcelona and Real Madrid) clearly outperform their German counterparts (FC Bayern Munich and Borussia Dortmund) at least in the digital online space.

In the next sections, the results will be broken down even further providing a team-by-team (micro) level of analysis.

### 4.3. Manchester United (the anchor)

If included in the ranking, the anchor site of Manchester United would have received the third highest rank for its official website. Hence, from this perspective Manchester United's website turned out as a viable anchor as a mid-table team. In principle, in a TEDS-based analysis, any professional team website, poor, average, or outstanding, could have served as an anchor. However, a good average site appears to lend itself far more easily to less skewed comparisons. It is noteworthy, that Manchester United was rated number two in the 2010 study (out of ten teams in that sample) among UEFA Champions League clubs practically being on a par with FC Barcelona's website. [2].

Of the areas that the official website struggled the most in this study, game video and interviews (with a rating of 2.58) was the most noticeable. Not only was this the lowest scenario score for Manchester United, but it also was the lowest score for this scenario across teams in the sample. The content for videos and interviews was a per-fee service to access. Based on paid membership, videos and interviews can be watched on what is called MUTV. Moreover, the MUTV service requires a Windows media player plug-in to run, which renders it difficult to operate for anyone not using a Microsoft platform. Furthermore, it is even more surprising no notice that Manchester United received the second highest rating for their YouTube pages (with a rating of 4.19) and boasted over 17,000 subscribers to their official channel, which appears to call into question the consistency of policies regarding the way the video content is managed on the official Manchester United website.

For the official website, the highest scores were posted in Ticketing (4.12, second highest among all teams for this scenario), where the team offers a highly versatile Old Trafford stadium seating map, and in store and merchandising with exceptional item navigation (4.17, the highest rating for this scenario among all teams). The online shopping site also continuously updates its subject summary according to recent events, like the championship of Premier League, or retirement of the long-term team coach Sir Alex Ferguson.

By far, Manchester United's most notably low scores were found in the mobile application and access scenario. As indicated before, no official mobile app seems to be offered; neither listed on their website, nor in the Apple App Store. Instead, Manchester United provides an SMS service to send updates to a subscribed mobile phone in the form of text messages. The team also provides a mobile version of their official website; however, this mobile version is not automatically loaded unlike other websites on mobile devices. A search through the mobile tab of the official website is required to find the URL for the mobile site. In summary, Manchester United served as a reference or anchor site in this study. Nevertheless, it came as a surprise that the co-leader in the 2010 Scholl & Carlson study [2] was no longer in that same position three years later when rated over 11 scenarios including the mobile application and access scenario. In this area Manchester United (score of 2.62) has a great potential for improvement.

### 4.4. FC Bayern Munich

The 2013 UEFA Champions League winner FC Bayern Munich ranks only third in terms of official websites for the four teams in our sample, which is the same rank this team received in Scholl and Carlson's [2] study. Overall, FC Bayern's official website scored fourth place in four of seven considered scenarios (store and merchandising (3.61), team news (3.54), schedule and results (3.69), and game video and interviews (3.19)). However, the website placed second for the presentation of player information particularly due to a well-designed appearance. Each FC Bayern player was found pictured in 3-D format in a circular setup, allowing any site visitor to scroll through and virtually select players based on their appearance on the field. Raters found this one of the most remarkable experiences for this scenario, and it also scored high in terms of affection and ease of use.

Other highlights of FC Bayern's official website were the schedule and results scenario (with a rating of 3.69). The overall rating for this scenario only placed fourth, but in this section of the website, the team provides visitors a link to download the calendar file, which includes the team's fixtures for the whole season, which is a highly convenient functionality ensuring the audience to always have the most recent game schedule available in their electronic calendars. This particular feature appeared to be unique to FC Bayern Munich.

Compared with all other teams in the sample, FC Bayern Munich was one of only two teams whose mobile accessibility outscored all other (macro) scenarios (with a score of 3.75). In fact, this score was so high that it was the second highest total score among all scenarios for the team as a whole (with player information on the official website being the only higher score (3.97)). However, the score for this scenario could have been even higher, if the official mobile app would be offered in additional languages. Currently the app is only offered in German, resulting in an average score of 1.0 for localization. Therefore, the addition of language support would be a strong recommendation for this scenario.

### 4.5. Borussia Dortmund

Borussia Dortmund (BVB) was the only sample team, which was not part of 2010 Scholl and Carlson

study [2]. Borussia Dortmund received the lowest overall score for its official website (3.20). Among the seven total scenarios for the official website, the team posted four of the lowest overall scores (store and merchandising (3.29), team news (2.96), schedule and results (3.50), and player information (3.07)). The team also received the lowest average score among team Facebook pages, with a score of 3.52.

Overall, the layout of this website was found rather poor. Only half of the page showed content, while the rest of the page was either filled by blank space or by advertisements. That way the website had a crowded appearance and was aesthetically questionable. The website was found to support three different languages (German, English and Japanese), which resulted in a low overall score in localization (with a total score of 1.93 for the official website).

In the other scenarios, Borussia Dortmund scored markedly higher. The team had mid-table rankings with the exception of game video interviews on the official website. Where other teams in the sample required payment to view video content, Borussia's website included relevant videos with features like current news. Overall, BVB received the third highest rating among sample teams in this particular scenario (3.21).

In terms of mobile access, Borussia Dortmund received a score of 3.52, resulting in a fourth place. However, the official app was found not advertised in the English version of the official team website and only offered in a German-language version, which had to be searched for and discovered in the Apple App Store. This resulted in a low average score of 1.0 (much like Bayern Munich), and stands out as an area of need for improvement.

## 4.6. FC Barcelona

FC Barcelona (*los azulgranas <blue and scarlet>* nicknamed for the color of the team's home uniforms) has dominated European soccer for at least half a decade before this study was conducted. Out of all teams in the sample, FC Barcelona posted the most consistent scores across all three macro scenarios. For the official website scenario, FC Barcelona received the top score overall, just as it did in the previous study by Scholl and Carlson [2]. The official website reached first place with the highest score in four of seven scenarios (schedule and results (4.20), player information (4.01), game video and interviews (3.96), and ticketing (4.12)). Specifically, the official website performed well in localization and language support. Not only was the text of the website offered in different languages, but buttons, headings, even left-to-right orientation was customized based on the visitor's preferences.

However, the official website did not excel in every scenario. For example, FC Barcelona received the second lowest score for the league and other teams scenario (2.89). Not only was this section difficult to find on the website, it never explicitly listed teams and leagues that Barcelona is part of. Instead, it provided an overly simplified league table with no links. This was clearly the weakest part of the tested portion of the website and could use improvement.

FC Barcelona also received the highest score for the social media scenario. In fact, they were the top team for each of the three social media websites used in this study (Facebook 4.24, Twitter 4.28, and YouTube 4.34). According to the raters the social media pages were constantly updated with the most current information, and offered a superior level of localization to audiences all over the world. Considering that this team had over 42 million 'Facebook likes' and over nine million Twitter followers at the time this study was conducted, they appears to meet the expectations of offering online resources at a high level.

The only scenario, in which FC Barcelona did not score highest, was mobile apps and accessibility. However, the team still placed second (3.94) behind Real Madrid (4.20) in this department. In general, the app performed quite well, and was devoid of any significant low sub-category ratings. Being offered in English and allowing for customizability placed FC Barcelona's app among the best.

## 4.7. Real Madrid

Real Madrid was another team, which had performed quite well in terms of their official website before. Across all sample teams, also in this study *los merengues* (nickname for the club) placed second, only behind FC Barcelona. This team was the only one found improved in its ranking from the 2010 Scholl and Carlson study [2].

Despite Real Madrid's favorable ranking in the aggregate score of its official website, the team only posted two high scores in the various scenarios, that is, in team news (4.01) and league and other teams (3.48). Specifically, team news stood out amongst the rest. This website did an excellent job of listing relevant news stories and including abilities to recommend them to friends on social media websites. Each news story was also accompanied by a photo/video gallery, which included media relevant to the news story selected. Team news was found to be probably one of the more advanced parts of the website, and Real Madrid has clearly made this feature stand out amongst the other teams in the sample.

Like FC Bayern Munich, Real Madrid received a higher score in the mobile scenario than they did on the official website and social media scenarios. Additionally, Real Madrid received the highest total score for mobile apps and accessibility with a rating

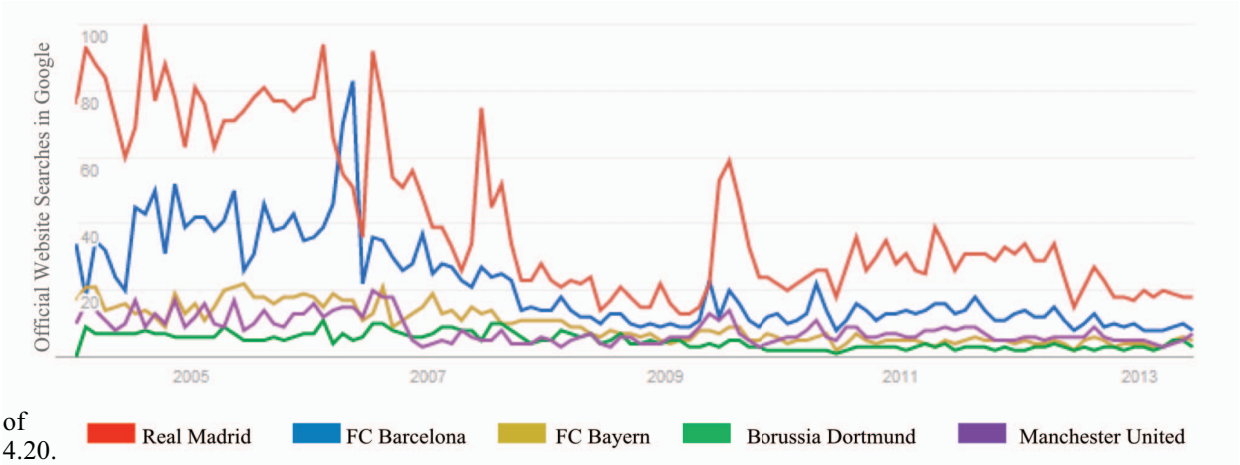


**Figure 3: Google Trends graph showing the peak levels of search interest on Google.com for each of the five teams' official websites**

Not only was the app advertised on the official website, it also provided a link for taking the visitor directly from the website to the download site of the official app in the Apple App Store.

Furthermore, Real Madrid's official app provided access to all of the basic information a visitor would expect to find on the website, and it also enabled the visitor to track live game stats. Additionally, this team offered other apps to experience anything from games to fantasy football. Real Madrid appeared as having made a conscious effort to reach wide audiences via mobile devices.

## 5. Discussion

### 5.1. The Role of Social and Mobile Media and the Changing Roles of Official Home Pages

One of the most notable findings of this study is, for every team in the sample, the social media pages scored higher than their corresponding official websites. Key areas that these social media pages succeeded in were community, time saving, and currency; although, the social media pages did not excel in every category. These pages were weak in areas like privacy, validity, and security. Considering these results, it is clear that the official websites of the 2013 UEFA Top Four teams still serve a valued purpose, but overall the social media pages are doing more to provide a quality experience to their visitors; it almost looks like official websites are receiving less emphasis from their respective hosts and that larger audiences are now reached via other channels.

Interestingly, the mobile scenario also scored higher than the official website for three out of the four teams in the sample. The across-the-board fairly high scores for mobile apps and mobile access scenario also point to an increased importance for this particular mode - see Figure 2 below.

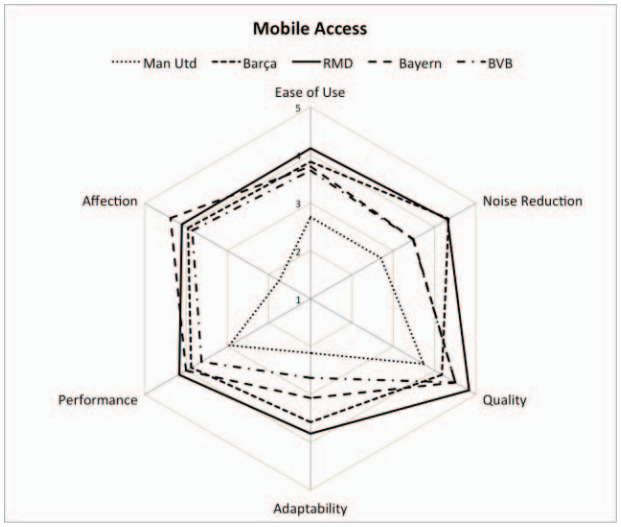


**Figure 2: A comparison of the mobile accessibility of all teams, based on the six types of criteria listed from the TEDS Framework (five point Likert scale)**

Mobile and social media have begun to occupy a significant portion of web traffic for 2013 UEFA Top Four football teams. Not only do they allow visitors to connect better with one another, they might also provide information more quickly and concisely, and can even be used as a delivery service for their operators. We acknowledge that Figure 3 only portrays search queries on Google, which we here use as a proxy for overall hits on each of these official

summary, it appears that mobile and social media scenarios have surpassed the official websites in terms of appeal and overall attractiveness. As a Google Trends analysis illustrates in Figure 3, the search interest in the official websites has been steadily declining over the past eight years [14]. In

websites. It appears that larger portions of content and interaction are now exchanged via social media and mobile apps than it is on official websites today. This does not, however, mean that the official website for soccer teams have no important role to play anymore. It may rather mean that the role of the official websites needs to be reconsidered and redefined.

### 5.3. Further Areas for Improvement

As the data have shown, each 2013 UEFA Top Four team scores reasonably well across the three macro-level scenarios, although some teams achieved lackluster ratings, while others surpassed the rest in various scenarios. For example, FC Barcelona's social media scenario trumps all other teams' social media ratings by a significant margin.

For official websites, FC Barcelona received high scores in all (micro-level) scenarios, except league and other teams. However, FC Barcelona was not alone in having this scenario as a weakness. All teams in the sample did a relatively poor job of identifying the leagues they were part of (all teams receiving a rating of less than 3.0, with the exception of Real Madrid and Manchester United), the other teams in those leagues, and then providing appropriate links for all of this information. We believe this would provide an improved service on the official websites.

For the social media scenario, FC Barcelona performed best on three of the social media sites. For example, on FC Barcelona's Facebook homepage, the raters found clear directions to other functions such as events or purchasing tickets. This added to their scores significantly in the area of ease of use. In terms of the quality category, the anchor site of Manchester United received high score levels because on social media pages, accuracy, comprehensiveness, currency, reliability, validity, and authority are all highly rated. Manchester United, although only used as an anchor in this study, nevertheless appears to have a cutting edge in social media pages.

Because social media have begun to play a significant role in many people's lives, and since they have a tremendous impact on teams' business processes, it might be worthwhile considering to put a high emphasis on further developing these sites, especially, in the areas of performance and linkage to merchandise and ticket stores. FC Barcelona's apps, which were located directly on their social media pages, were uniquely effective, and could be a role model used by other teams in this sample.

For mobile access, it is surprising that Manchester United, the anchor site, which has over 659 million fans all over the world [15], were found to not provide an official mobile application for the most popular smart phone in the world [16], with access to the largest app store as well. Meanwhile, mobile applications of other teams in the sample provide simple functions and a good-quality experience. For some of the teams in this sample, the mobile access scenario even received higher ratings than in the other two macro scenarios. Therefore, we would be surprised if Manchester United would refrain from developing an official mobile application for a variety of popular mobile devices platforms such as iOS, Android, and others. This would allow Manchester United to further expand their online reach capitalizing on the rapidly growing mobile computing market.

### 5.3. Limitations

As every study, so this one is not without limitations. First, we only used the iPhone to study the mobile apps and access for each 2013 UEFA Top Four team. This approach worked well for a majority of the sample teams, as they supported official iOS apps. However, we could not take into account any offerings for other mobile operating systems. We also acknowledge that this creates a sort of outlier effect for Manchester United who does not appear to provide any official applications.

The second limitation refers to the number and background of raters. Five raters were engaged in this study that were divided into several groups in order to perform and complete the ratings. Due to this limit of contributors, only two raters were used for some of the teams in the sampling. In addition, four out of the five contributors were non-native English speakers. However, all of the raters were trained in the TEDS framework and knowledgeable about European football. As the 2010 Scholl and Carlson study showed, cultural differences, age and gender differences, and diverse national provenances did not influence ratings in any significant and measurable way. Therefore, the results appear to stand with limited bias and cultural interference.

Another limitation addresses the size of the sample. Admittedly, many more teams combine to make up the UEFA Champions League. The size of this sample is fairly small and concentrated to only three different countries of origin. However, we picked some of the most popular and successful teams in the history of the UEFA competition. While the criteria for choosing the sampling were subjective and based on very recent sportive achievements, the aforementioned popularity of the teams and their commercial success still provides a solid base, on which studies on UEFA Champions League clubs can be carried out in the future.

## 6. Conclusions

This study made the following contributions: (1) it extends the eight evaluated scenarios of the 2010 Scholl and Carlson study [2] to eleven, adding

various social media scenarios and mobile uses; (2) the results demonstrate a changing role and potentially a declining importance of official team websites; and (3) it highlights the need for diversity in mobile offerings in the rising pool of mobile devices.

In the future, the research team would expect more studies to be performed with a focus on mobile computing, which represents a rapidly growing field of interactive use of information technology clearly warranting the study of other platforms and other devices.

A similar interest and expansion can be expected in the area of social media and professional sports teams. Based on our research, these teams have a wide variety of followers and fans in a multitude of countries, providing for a large market and hence a rich environment for further studies.

Based on this research, the TEDS framework has also proven that it can be extended to a multitude of novel and interactive scenarios, and across different types of information artifacts, other than traditional websites.

In summary, we have analyzed and presented the general success of digital and social online media for professional sports teams from an information perspective. We were also able to identify how social media have begun to play an important role in sports management. Social media and mobile apps complement the traditional websites in areas such as community, currency, and time saving. However, social media have inherent weaknesses too (e.g., privacy and security).

From our understanding, the official websites do still serve as a valuable tool for professional sports teams; mainly in the areas of commerce transactions. While some of the teams offered links on their social media pages to direct a user to the store for tickets or merchandise, these functions were still handled by the official team websites. In the future this could possibly change though as well, and the traditional website may need repositioning and their roles may need rethinking.

Last, and not least, the TEDS framework proved to be capable of displaying the quality of social media and mobile apps for the 2014 UEFA Top Four clubs in our sample. We feel encouraged to use a similar research design more comprehensively (meaning more sites in the comparison) and also more frequently, so to create snapshots, which reveal the evolution of online presences across media and delivery formats over time.

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