An Analysis of Facebook Social Media Marketing Key Performance Indicators: the Case of Premier League Brands

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***Abstract*— Many companies diligently establish their presence on Social Networking Services (SNSs) as they recognize Social Media Marketing (SMM) will be the next "holy grail of marketing". However, yet the true value of SMM remains unclear because marketing based on social networking still defines its best practices and metrics. This paper provides a small step towards understanding how to unlock a potential of SMM through analysis of Key Performance Indicators (KPIs) for the flagship SMM platform Facebook. The case study of five largest Premier League brands analyses relationships among Facebook SMM KPIs and identifies several interesting connections. The most important managerial implication of our analysis suggests that the number of Facebook fans, although often criticized as the relevant SMM metric, is the most important SMM KPI.**

Keywords—Social Media Marketing, Facebook, Google Trends, Socialnumbers, Key Performance Indicators, Premier League brands

I. INTRODUCTION

Social Media Marketing (SMM) is recognized as one of the major drivers of margin increase and productivity boost across industries, as well as a crucial medium for interacting with consumers, partners and other stakeholders [1][2][3]. However, despite having enormous potential SMM is nascent and still defining its best practices and metrics [4][5]. From one hand, companies do not fully understand consequences of integrating SMM into their value chain and still search for best methods how to measure the SMM impact on their businesses [6][7]. From the other hand, market regulators should understand how SMM affects end-users, primarily from the aspect of privacy issues and customer protection. This paper should be a small step towards understanding how SMM really works in practice. Namely, we will analyse Key Performance Indicators (KPIs) for the flagship SMM platform Facebook through the case study of five largest Premier League[1] brands: *Manchester United*, *Chelsea*, *Arsenal*, *Liverpool* and *Manchester City*.

[1] The Premier League (*http://www.premierleague.com*) is the English primary football competition comprising 20 clubs playing 38 matches each from August to May every year.

This paper is organized as follows. Section 2 will describe SMM, especially focusing on the Facebook platform, as well as identify Facebook SMM KPIs. Afterwards, the reason for choosing Premier League brands for the case study is going to be presented in Section 3. Section 4 will provide the analysis of Facebook SMM KPIs and Section 5 will conclude the paper with discussion of research limitations, as well as managerial implications and future academic challenges arising from the conducted analysis.

II. SOCIAL MEDIA MARKETING ON FACEBOOK

In today's world, Social Network Services (SNSs) [8][9][10] have a global impact on a modern society, ranging from serving as a personal tool for communication and online gaming [11] to a business tool for collaboration and marketing. Estimations say that SMM was with $8.8 million the largest contributor to overall social media revenue of $16.9 billion in 2012 [12], while the social media revenue worldwide is expected to reach $34 billion by 2016 [13].

Facebook was founded in 2004 and started to develop very fast, becoming the most important SNS with more than a billion monthly active users at the end of 2012 [14], thus reaching 42% of global Internet users [15]. Almost 60% of monthly active users (i.e., 584 million) spend on average 50 minutes Facebooking on a daily basis. Facebook's additional strength is a huge mobile user base – by the end of 2012 there were more than 600 million users which connected to Facebook through their mobile devices [14].

Simultaneous to rapid Facebook growth brands searched for their new "holy grail of marketing", a channel through which they can reach their consumers with the lowest possible cost and the highest possible efficiency. Facebook seemed to be a perfect match. Nevertheless, Facebook, who owned a vast user base but lacked sustainable business model, also quickly recognized the opportunity and offered its service to businesses. Therefore, it was a win-win situation. Today three brand promotion channels exist on Facebook: i) *brand pages*, ii) *branded applications*, and iii) *ads* [5]. In this paper we will focus on the fundamental promotion channel – Facebook brand pages.

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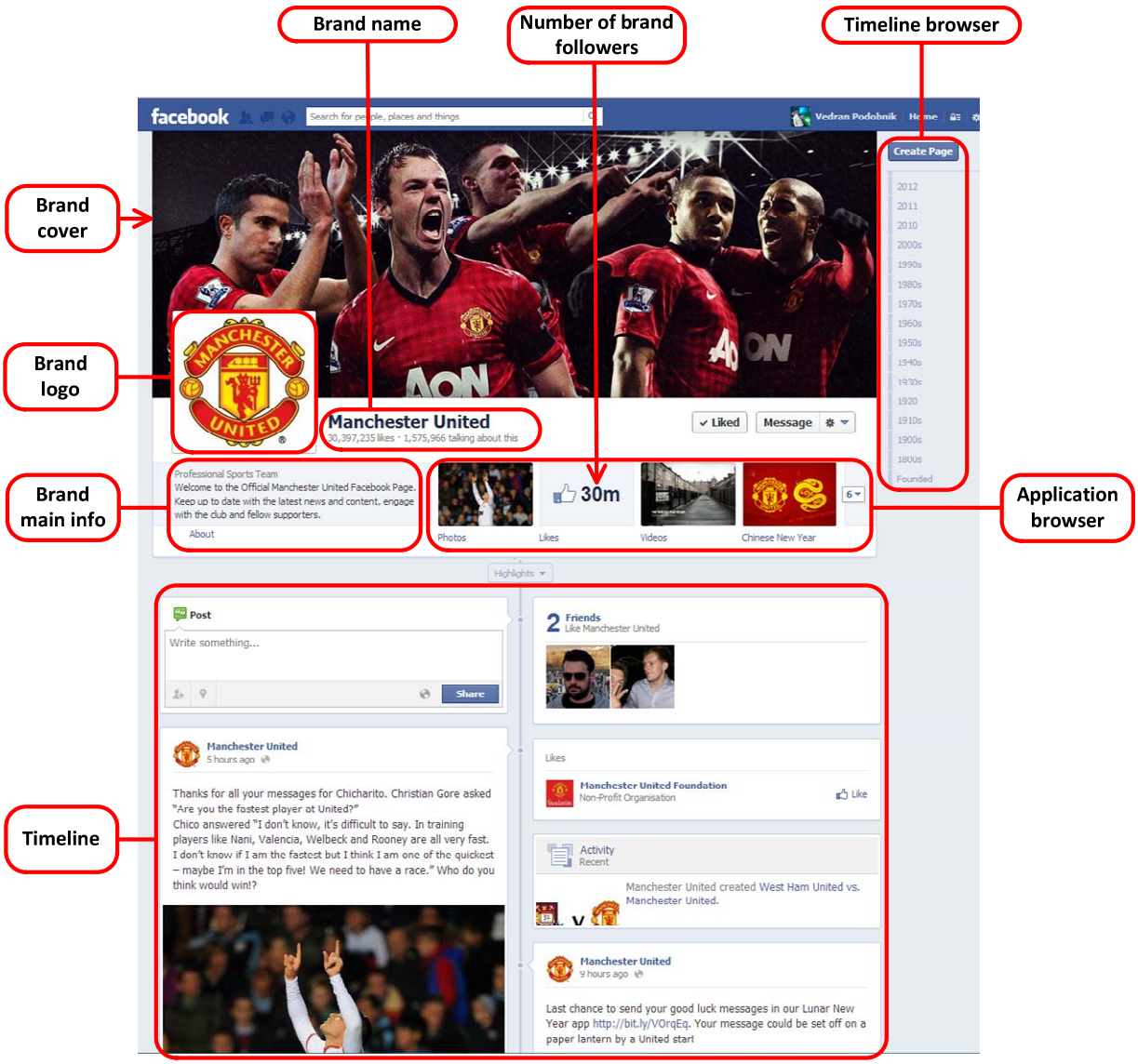


Fig. 1. The Facebook brand page for the Premier League brand "Manchester United" (screenshot date: 10/1/2013).

Timeline-based Facebook brand pages (Fig. 1) were introduced in the late 2011 and they upgraded traditional Facebook brand pages with temporal dimension. Consequently, brand followers can browse for most important events in brand history (i.e., one can learn from Fig. 1 that the Premier League club Manchester United was founded in the 19th century (see *timeline browser*), while more detailed brand messages are available by scrolling through the timeline part of the page – here one can also learn that exact year of the club foundation was 1878). Furthermore, one can note that the Manchester United brand currently has 30 million followers (see *application browser*) and see pictures of some of the best club players (see *brand cover*). Fig. 1 shows how Facebook timeline-based brands pages serve as very convenient interactive channel for communicating both static brand info such as *brand main information*, *brand logo*, *brand contact* and *brand history data*, as well as dynamic brand info such as *interview with a player* (i.e., the timeline status update in Fig. 1 – the answer of the player named Chicharito to a supporter's question whether he is the fastest Manchester United player).

A Facebook user can *like* certain brand's Facebook page and by doing so he/she becomes a *fan* who *follows* that brand. Administrators of Facebook brand pages have capability to post updates. These updates are then not visible just on the brand's Facebook page, but can as well be visible on Facebook Timelines of brand's Facebook fans. Therefore, posting an update represents pushing a message not just to current brand's consumers but to potential new consumers as well because Facebook Timelines are (semi-)public web pages (level of public exposure to other Facebook and Internet users depends on the user privacy settings). Now, it is no longer necessary for users to visit brand web pages or portals to find latest news and other information connected with the brand they like or just have heard about, but information comes to consumers in the real-time and it is interactive. Such push-based Customer Relationship Management (CRM) enables consumers to find new information more quickly and in shorter time [16].

TABLE I. DESCRIPTION OF FACEBOOK SMM KPIS

Key Performance Indicator	*Key Performance Indicator operationalization in our analysis*	*What does it measure (in our analysis)?*	*How is it calculated in our analysis?*
number of brand's fans on Facebook	**fanCountWeek**	brand's **reach** (average for a week)	fetched from Facebook (via socialnumbers.com)
change of fan number	**fanCountWeekDelta**	brand's **growth** (average for a week)	calculated from longitudinal *fanCountWeek* data
number of fans "talking about" the brand on Facebook	**talkingAboutWeek**	**engagement** with the brand (average for a week)	fetched from Facebook (via socialnumbers.com)
change of "talking about" number	**talkingAboutWeekDelta**	brand's **popularity** (average for a week)	calculated from longitudinal *talkingAboutWeek* data

TABLE II. FACTS ABOUT THE LEADING FIVE PREMIER LEAGUE BRANDS (RANKED ACCORDING UEFA FIVE-YEAR WINDOW POINTS) [20][22]

Club	*UEFA points*	*2011/2012 Premier League final standings*	*Stadium capacity*	*2012 value [mil $]*	*Match day portion in value* [%]*	*Broadcasting portion in value‡ [%]*	*Commercial portion in value† [%]*	*Brand portion in value§ [%]*	*2012 revenue [mil $]*
Manchester United	128,535	2nd	75,811	2,235	29%	32%	25%	13%	532
Chelsea	120,535	6th	42,449	761	27%	40%	20%	12%	362
Arsenal	110,535	3rd	60,361	1,292	37%	35%	16%	12%	364
Liverpool	75,535	8th	45,276	619	20%	32%	34%	14%	295
Manchester City	69,535	1st	47,405	443	16%	40%	30%	14%	246

* A portion of team's value attributable to gate receipts (including season tickets and memberships).

‡ A portion of team's value attributable to television and radio revenue.

† A portion of team's value attributable to sponsorship and merchandise revenue.

§ A portion of team's value attributable to the management of its brand.

Based on described properties of Facebook brand pages, two major SMM KPIs are defined:

i) number of brand's fans on Facebook (i.e., the number of Facebook users who *liked* Facebook brand page and whose Facebook Timelines are potential[2] targets for brand's posts), and

ii) number of fans "talking about" the brand on Facebook (i.e., the number of Facebook users who *actively interact*[3] with Facebook brand page).

The former KPI measures brand's *reach*, while the latter measures *engagement* with the brand. While measuring the "number of fans KPI" is rather straightforward, the exact formula for calculating "talking about KPI" is not disclosed to public so various discussions exist whether the "talking about KPI" is a good measure of fan engagement with the brand or not [19]. Furthermore, in our analysis we included two additional KPIs which are derived from the "number of fans KPI" and the "talking about KPI" longitudinal data:

i) "change of fan number KPI" which measures brand's *growth*, and

ii) "change of talking about KPI" which measures brand's *popularity*.

We fetched data from Facebook on a daily basis and aggregated for analysis to a weekly granularity by calculating weekly value as an average of all daily values in that week[4]. A detailed description of Facebook SMM KPIs we use in our analysis is given in Table I.

III. PREMIER LEAGUE BRANDS

Leading Premier League brands (Table II) are chosen for the Facebook SMM KPIs study because they represent relatively large economic stakeholders with substantial portion of their value (i.e., 12-14%) coming from their brands [20], while Premier League is the most-watched football league in the world, broadcast in 212 territories around the world and reaching 643 million homes [21]. The Union of European Football Associations (UEFA), the administrative body for association football in Europe, provides club rankings based on the results of clubs competing in the five previous seasons of the UEFA Champions League and UEFA Europa League [22]. According to UEFA's 2012/2013 rankings five most successful Premier League clubs are: *Manchester United* (3rd overall in Europe), *Chelsea* (5th overall), *Arsenal* (6th overall), *Liverpool* (18th overall) and *Manchester City* (19th overall). These clubs are therefore included in the analysis because they are most successful English clubs during last five years and as such possess strong and valuable brands.

A. Leading Premier League Brands on Facebook

Socialnumbers (*http://socialnumbers.com*) is a portal offering rich statistical information about Facebook brands' pages for all European countries as well as 50 major countries outside the Europe. The list of top ten most important (according the "number of funs KPI") United Kingdom (UK) sport brand Facebook pages in January 2013 is presented in Table III.

[2] There are a lot of posts on Facebook every minute, so Facebook introduced the *EdgeRank* mechanism [17] to evaluate quality of every post and estimate which content to push to users and which content not to push.

[3] "Talking about KPI" measures fan-initiated activity related to a Facebook brand page, including *posting* to a brand's Facebook Timeline, *liking*, *commenting*, *sharing* brands posts, *mentioning* brand's page and similar [18].

[4] We fetched from Facebook (via *socialnumbers.com*) longitudinal data for the period from 4/12/2011 to 24/11/2012. Although for certain brands data does not exist until later than 4/12/2011, the end of analysis is the same for all brands.

TABLE III. THE LIST OF MOST IMPORTANT (ACCORDING THE "NUMBER OF FUNS KPI") UK SPORT BRAND FACEBOOK PAGES

Ranking	*Brand*	*Facebook brand page link [unique part of a web address after the* https://www.facebook.com*]*	*Brand description [if different from leading five Premier League brands]*	*Number of funs [in millions]*
1.	Manchester United	manchesterunited		30.4
2.	Chelsea	ChelseaFC		15.1
3.	Arsenal	Arsenal		12.6
4.	Wayne Rooney	WayneRooney	Manchester United player	11.3
5.	Liverpool	LiverpoolFC		11.1
6.	Steven Gerrard	84867552203 *(currently inactive)*	Liverpool player	7.5
7.	Didier Drogba	8529799634 *(currently inactive)*	Chelsea player from 2004 to 2012	5.5
8.	Manchester City	mcfcofficial		4.4
9.	Robin Van Persie	pages/Robin-Van-Persie-Fan-Page/11065914149	Arsenal player from 2004 to 2012, currently Manchester United player	4.1
10.	Frank Lampard	pages/Frank-Lampard-Fan-Page/115714874568	Chelsea player	3.5

TABLE IV. THE LIST OF MOST IMPORTANT (ACCORDING THE "TALKING ABOUT KPI") UK SPORT BRAND FACEBOOK PAGES

Ranking	*Brand*	*Facebook brand page link [unique part of a web address after the* https://www.facebook.com/*]*	*Brand description [if different from leading five Premier League brands]*	*Number of funs "talking about" [in thousands]*
1.	Manchester United	manchesterunited		1,576
2.	Chelsea	ChelseaFC		558
3.	Liverpool	LiverpoolFC		460
4.	Arsenal	Arsenal		294
5.	Manchester City	mcfcofficial		215
6.	Wayne Rooney	WayneRooney	Manchester United player	154
7.	Tottenham Hotspur	TottenhamHotspur	Premier league club (ranked 6th in UEFA rankings)	85
8.	Robin Van Persie	pages/Robin-Van-Persie-Fan-Page/11065914149	Arsenal player from 2004 to 2012, currently Manchester United player	72
9.	Rio Ferdinand	page/Rio_Ferdinand-219643781416878/	Manchester United player	59
10.	Frank Lampard	pages/Frank-Lampard-Fan-Page/115714874568	Chelsea player	52

It can be noticed that all pages on the list are either official pages of the leading Premiere League clubs or their player's fan pages, what makes Premiere League brands dominant in the UK SMM arena. The list of top ten most important (according to the "talking about KPI") UK sport brand Facebook pages in January 2013 looks very similar and again is populated only with Premier League related brands (Table IV).

Based on the discussion about SMM and leading Premier League brands on Facebook, we formulate following hypotheses about Facebook SMM KPIs:

- **H1a:** Leading brands in sports industry have different SMM reach.
- **H1b:** Leading brands in sports industry have different SMM growth rates.
- **H2a:** Leading brands in sports industry have different levels of SMM fan engagement.
- **H2b:** Leading brands in sports industry have different levels of SMM popularity.
- **H3a:** SMM growth rate of a leading brand in sports industry is correlated with its SMM reach.
- **H3b:** SMM engagement of a leading brand in sports industry is correlated with its SMM reach.
- **H3c:** SMM popularity of a leading brand in sports industry is correlated with its SMM reach.
- **H3d:** SMM engagement of a leading brand in sports industry is correlated with its SMM growth rate.
- **H3e:** SMM popularity of a leading brand in sports industry is correlated with its SMM growth rate.
- **H3f:** SMM popularity of a leading brand in sports industry is correlated with its SMM engagement.

B. Leading Premier League Brands on the Internet

Additional KPI we included in our analysis to compare SMM KPIs with more general Internet KPIs is brands' "Google Trends score" (*http://www.google.com/trends*) which measures relative occurrence (on the scale 0-100) of the term in the Google's search engine (we call it brand *presence*, while the change of the brand presence is called the brand *trend*). From Fig. 2 we can notice that the brand "Arsenal" is on average most *present* Premiere League brand on Internet with average "Google Trends score" equal to 53.

We fetched data for "Google Trends score" from Google (only weekly granularity available, The Google Trends data was fetched for the period from November 2011 to December 2012). A detailed description of KPIs related to the "Google Trends score" is given in Table V.

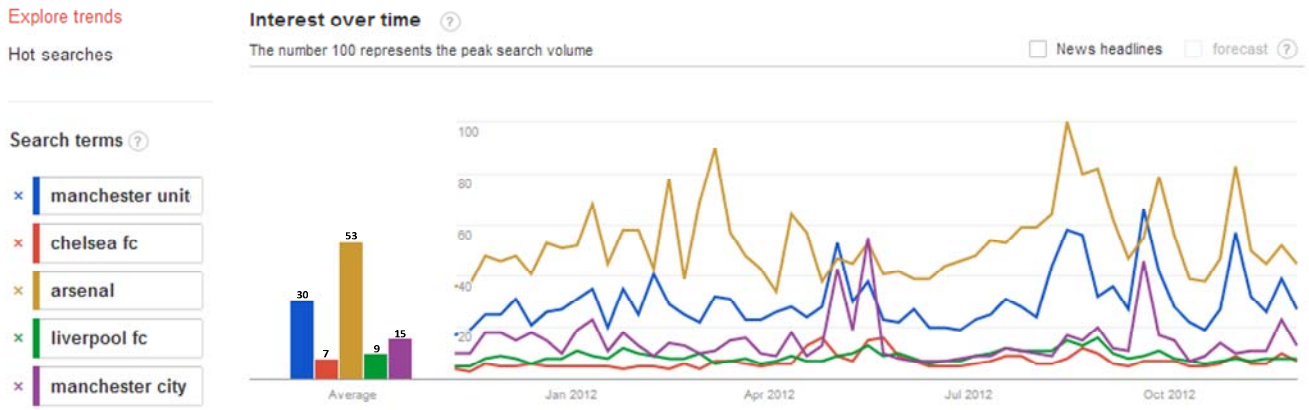


Fig. 2. A screenshot of the Google Trends web site comparing popularity of the leading five Premier League brands in the period Dec. 2011 – Nov. 2012.

TABLE V. DESCRIPTION OF GENERAL INTERNET BRAND KPIS

Key Performance Indicator	*Key Performance Indicator operationalization in our analysis*	*What does it measure (in our analysis)?*	*How is it calculated in our analysis?*
brand's Google Trends score	**googleTrendsWeekScore**	brand **presence** (on the scale of the whole Internet, average for a week)	fetched from Google
change of brand's Google Trends score	**googleTrendsWeekScoreDelta**	brand's **trend** (on the scale of the whole Internet, average for a week)	calculated from longitudinal *googleTrendsWeekScore* data

Based on discussion about SMM and Internet brand KPIs, as well as description of leading Premier League brands on Facebook and Internet, we formulate following hypotheses about SMM and Internet brand KPIs:

- **H4a:** Leading brands in sports industry have different levels of Internet presence.
- **H4b:** Leading brands in sports industry have different Internet trends.
- **H5:** Internet KPIs of a leading brand in sports industry are correlated with the brand's SMM KPIs.
- **H6:** Internet presence of a leading brand in sports industry is correlated with the brand's Internet trend.

IV. ANALYSIS OF KEY PERFORMANCE INDICATORS FOR THE LEADING PREMIER LEAGUE BRANDS

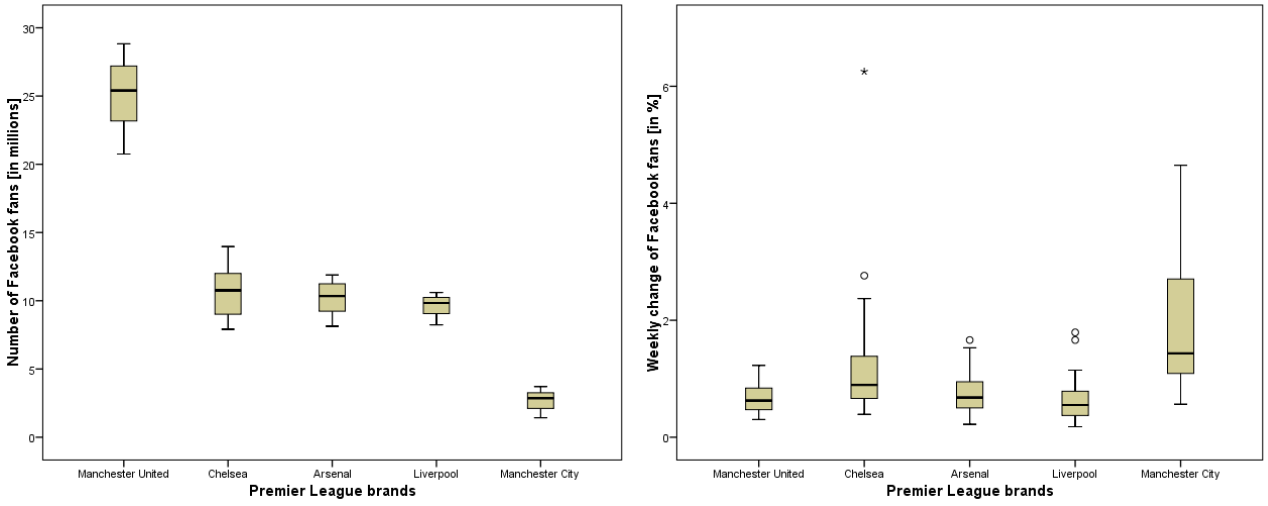
Fig. 3 presents comparison of the brand's reach (i.e., "fanCountWeek" KPI) and the brand's growth (i.e., "fanCountWeekDelta" KPI), Fig. 4 presents comparison of the engagement with the brand (i.e., "talkingAboutWeek" KPI) and the brand's popularity (i.e., "talkingAboutWeekDelta" KPI) and Fig. 5 presents comparison of the brand's presence (i.e., "googleTrendsWeekScore" KPI) and the brand's trend (i.e., "googleTrendsWeekScoreDelta" KPI).

The non-parametric *Friedman's ANOVA* test is used to test for differences between five brands for every analysed KPI because assumptions of parametric tests are violated in the analysed data. Tests show that there exits significant difference in the brand reach (H1a), $\chi^2(4)=131.45$, $p<0.01$, as well as in the growth rates (H1b), $\chi^2(4)=109.80$, $p<0.01$ (tests are confirmed with the box plot in Fig. 3).

Furthermore, tests show that there exits significant difference in the level of fan engagement with the brand (H2a), $\chi^2(4)=125.91$, $p<0.01$, while there is no significant difference in the brand popularity (H2b), $\chi^2(4)=.780$, $p>0.05$ (tests are confirmed with the box plot in Fig. 4).

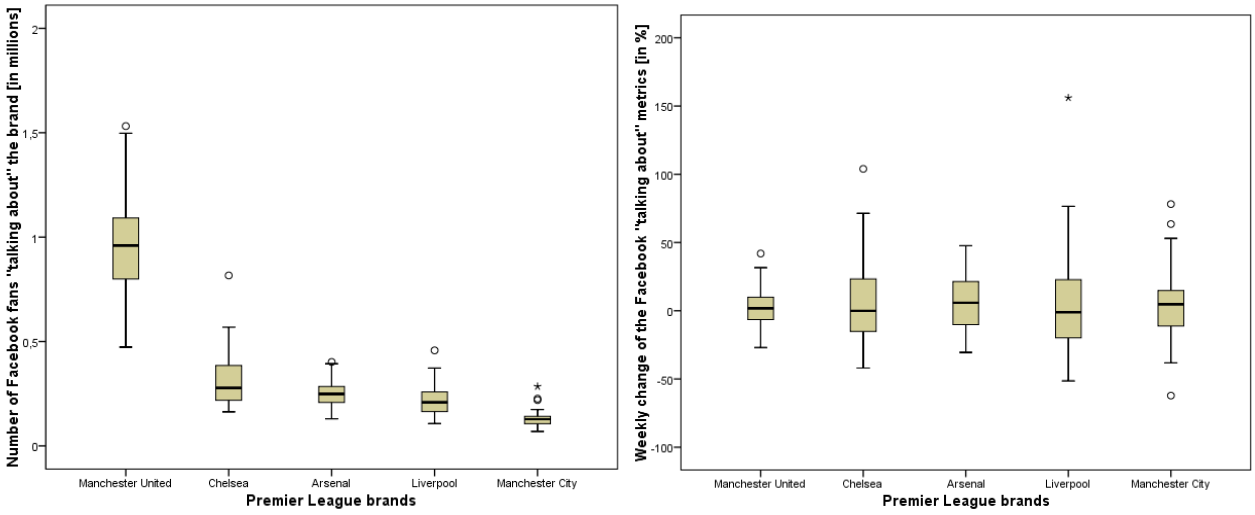
Finally, tests show that there exits significant difference in the brand presence (H4a), $\chi^2(4)=77.70$, $p<0.01$, while there is no significant difference in the brand trend (H4b), $\chi^2(4)=.729$, $p>0.05$ (tests are confirmed with the box plot in Fig. 5).

Table VI shows the aggregate results of correlation tests (the non-parametric correlation *Kendall's tau test* is used because analysed data did not meet parametric assumptions and the analysed data set is small). It can be noticed that brand's growth rate is correlated with its reach (H3a) for four out of five analysed brands and that a negative linear correlation of a medium effect is identified on average. The possible explanation for such finding is the market saturation which prevents high growth rates for brands whose fans already present a big proportion of the market and vice versa. Furthermore, we can learn that engagement of a brand is correlated with its reach (H3b) for four out of five analysed brands and that a positive linear correlation of a medium effect is identified on average. The possible explanation for such finding is the network effect which boosts engagement of fans with brands that possess a large fan base and vice versa. While there exist no significant linear correlation between the brand popularity and its reach (H3c), engagement of the brand and brand's growth rate (H3d) as well as the brand popularity and its growth rate (H3e), the brand popularity is correlated with its level of engagement (H3f) for four out of five analysed brands and has a positive linear correlation of a medium effect on average. This finding is in possible conflict with our previous conclusions that there exits significant difference in the level of fan engagement with the brand (H2a), while there is no significant difference in the brand popularity (H2b). Therefore, further analysis using data from other periods or data about other leading sport brands is needed before certain conclusions about the hypothesis *H3f* can be made.



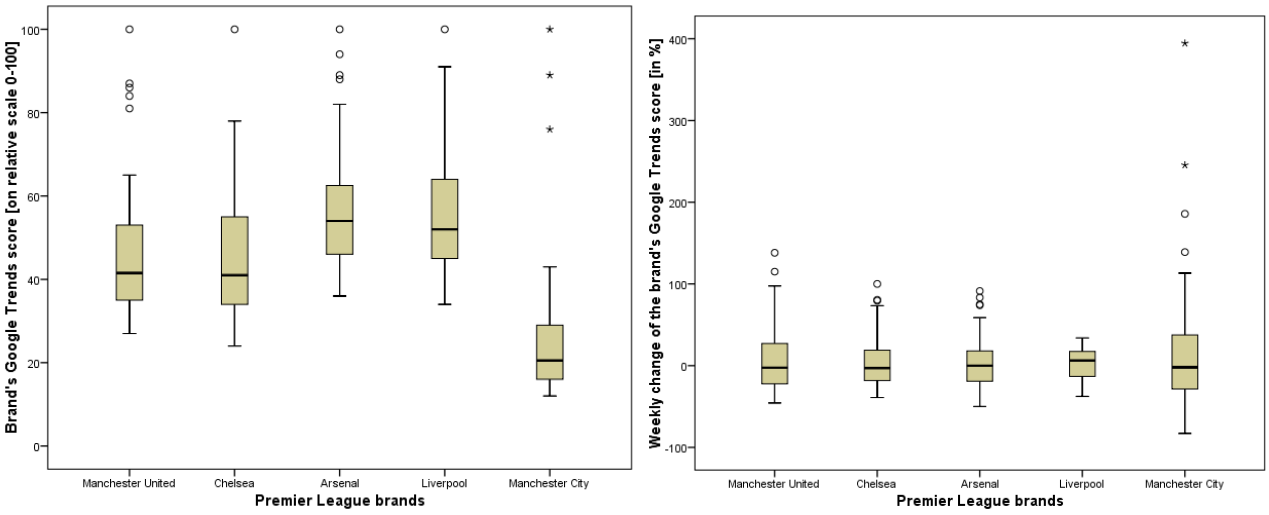
(a) (b)

Fig. 3. Comparison of "fanCountWeek" (a) and "fanCountWeekDelta" (b) KPIs during 2012 for the five leading Premier League brands.



(a) (b)

Fig. 4. Comparison of "talkingAboutWeek" (a) and "talkingAboutWeekDelta" (b) KPIs for the five leading Premier League brands.



(a) (b)

Fig. 5. Comparison of "googleTrendsWeekScore" (a) and "googleTrendsWeekScoreDelta" (b) KPIs for the five leading Premier League brands.

TABLE VI. THE AGGREGATE RESULTS OF CORRELATION TESTS AMONG KPIS FOR THE FIVE LEADING PREMIER LEAGUE BRANDS

Key Performance Indicator		*fanCountWeek*	*fanCountWeekDelta*	*talkingAboutWeek*	*talkingAboutWeekDelta*	*googleTrendsWeekScore*	*googleTrendsWeekScoreDelta*
fanCountWeek (i.e., brand's reach)	Correlation determined						
	Correlation coefficients						
fanCountWeekDelta (i.e., brand's growth rate)	Correlation determined	4/5					
	Correlation coefficients	*-.370* *-.391* *-.573* *-.468*					
talkingAboutWeek (i.e., engagement with the brand)	Correlation determined	4/5	2/5				
	Correlation coefficients	*.624* *.304* *.225* *.303*	*-.233* *.347*				
talkingAboutWeekDelta (i.e., brand's popularity)	Correlation determined	0/5	0/5	4/5			
	Correlation coefficients			*.220* *.241* *.417* *.355*			
googleTrendsWeekScore (i.e., brand's presence)	Correlation determined	1/5	0/5	2/5	2/5		
	Correlation coefficients	*.254*		*.200* *.375*	*.218* *.246*		
googleTrendsWeekScoreDelta (i.e., brand's trend)	Correlation determined	0/5	0/5	0/5	0/5	5/5	
	Correlation coefficients					*.363* *.289* *.378* *.310* *.378*	

TABLE VII. AN OVERVIEW OF FORMULATED HYPOTHESES

Hypothesis	*Supported / Not supported*	*More details about hypothesis*
H1a	Supported	Box plot in Fig. 3(a) and related statistic test
H1b	Supported	Box plot in Fig. 3(b) and related statistic test
H2a	Supported	Box plot in Fig. 4(a) and related statistic test
H2b	Not supported	Box plot in Fig. 4(b) and related statistic test
H3a	Supported	Table VI
H3b	Supported	Table VI
H3c	Not supported	Table VI
H3d	Not supported	Table VI
H3e	Not supported	Table VI
H3f	Further analysis needed	Table VI (with additional comments)
H4a	Supported	Box plot in Fig. 5(a) and related statistic test
H4b	Not supported	Box plot in Fig. 5(b) and related statistic test
H5	Not supported	Table VI
H6	Further analysis needed	Table VI (with additional comments)

Finally, we can conclude that there is no significant linear correlation among Internet and SMM KPIs (H5) and that Internet presence of brand is correlated with its Internet trend (H6) for all analysed brands and that a positive linear correlation of a medium effect is identified on average. This finding is again in possible conflict with our previous conclusions that there exits significant difference in the brand presence (H4a), while there is no significant difference in the brand trend (H4b). Therefore, further analysis using data from other periods or data about other leading sport brands is needed before certain conclusions about the hypothesis *H6* can be made. Table VII provides an overview of all formulated hypotheses and the information whether our analysis supported them or not.

V. CONCLUSION

This paper presented an analysis of Key Performance Indicators (KPIs) for the flagship Social Media Marketing (SMM) platform Facebook through the case study of five largest Premier League brands. Based on Premier League characteristics described in the paper, analysis results were generalized from the level of the Premier League to the level of leading brands in sport industry. However, conducted research cannot be generalized on the level of all brands in sport industry because our research did not take into account medium-sized or small brands that could follow different KPI patterns. A number of hypotheses about relationships among analysed KPIs (i.e., brand reach, growth, engagement, popularity, presence and trend) were formulated and tested, leading to discovery and explanation of some interesting findings.

Additional attention-grabbing finding is almost absolute overlap between Premier League club rankings based on the results of competitions in the five previous seasons of the UEFA leagues and SMM rankings based both on the "number of funs KPI" as well as on the "talking about KPI". Interestingly, much less overlap is found between latest (i.e., season 2011/2012) Premier League final standings and SMM rankings, what leads towards conclusion that brand building in the virtual SMM world (similarly to traditional brand building practices) is not an instant process, but rather long-term business strategy which has to be supported with the continues high performance of the brand. Nevertheless, the most important managerial implication of our analysis suggests that, although often criticized as the relevant SMM metric, number of fans (i.e., brand reach) is the most important SMM KPI because it is correlated with several other KPIs (i.e., brand growth and engagement). Therefore, leading brands in sports industry should as their primary goal strive towards maximizing fan base. On the other hand, market regulators should protected Internet users by preventing SMM frauds based on fan falsification.

Finally, conducted analysis did not answer all questions regarding performance of Premier League brands' KPIs but set up some future academic challenges as well. Namely, further analysis is needed to determine correlation between the brand popularity and its level of engagement, as well as between the Internet presence of the brand and its Internet trend. Furthermore, for future work we plan to apply regression mechanism on our data to conclude which events influence Premier League brand's SMM KPIs (for example, the number of goals scored, the purchase of a new player or the change of club manager).

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