

The applications of social media in sports marketing

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Abstract

Introduction: In the era of big data, sports consumer's activities in social media become valuable assets to sports marketers. In this paper, the authors review extant literature regarding how to effectively use social media to promote sports as well as how to effectively analyze social media data to support business decisions. **Methods:** The literature review method. **Results:** Our findings suggest that sports marketers can use social media to achieve the following goals, such as facilitating marketing communication campaigns, adding values to sports products and services, creating a two-way communication between sports brands and consumers, supporting sports sponsorship program, and forging brand communities. As to how to effectively analyze social media data to support business decisions, extant literature suggests that sports marketers to undertake traffic and engagement analysis on their social media sites as well as to conduct sentiment analysis to probe customer's opinions. These insights can support various aspects of business decisions, such as marketing communication management, consumer's voice probing, and sales predictions. **Conclusion:** Social media are ubiquitous in the sports marketing and consumption practices. In the era of big data, these "footprints" can now be effectively analyzed to generate insights to support business decisions. Recommendations to both the sports marketing practices and research are also addressed.

Keywords: social media, social media analytics, big data

Introduction

Social media are now highly involved in business practices. For instance, Facebook has attracted 2.1 billion users around the world.

Owing to such traffic, Facebook created \$27.6 billion revenue from its advertising services and was valued at \$385 billion, making it the world's sixth biggest company (The Telegraph, 2017). Such trend has also greatly influenced the landscape of sports marketing. From the

consumption side, there have been around 442.7 million sports fans who registered on sports related Facebook pages in 2017, an increase of 21% compared to the figure in 2016. Other social media platforms, such as Twitter, Instagram, and YouTube, also had a tremendous increase on subscriptions or registrations (Sportcal, 2017).

As to the impact upon sports marketing practice, social media are now widely employed in various sports sectors, such as professional sports leagues, national sports governing bodies, sports event organizers, sports sponsors, and elite athletes. Compared to 2014, 15 out of 16 Polish football teams use utilized Instagram in 2016 to promote their sports events (Siguencia, Herman, Marzano & Rodak, 2017). Elite athletes also utilize social media to have direct interaction with their fans (Korzynski and Paniagua, 2016). Some of famous athletes have million followers that actively participate in their social media pages, which further increases these athletes' popularity and commercial values. Sports organizations also exploit these advantages of social media. For instance, the Wimbledon tennis event organizer produces video contents and have them disseminated through various social media outlets, including snapchat, periscope, and Instagram (International Event Group, 2017a; International Event Group, 2017b). Due to its inexpensive cost, Eagleman (2013) found that almost all national sports governing bodies launch their own Facebook and Twitter pages to attract sports consumers.

It is evident that social media create tremendous business values to sports marketers. Firstly, social media are now a very important promotional tool for non-mainstream sports organizations to improve the publicity as well as to provide interactive forum (Vann, 2014).

Secondly, advanced design, such as live streaming application, allow sports fans to watch live program on smart phones. Many behind-the-scene contents, such as interviewing athletes in the locker room, are now transmitted in real time (Hochberg, 2015). All of such enrich sports content as well as enhance entertaining values of a sports brand. Thirdly, some corporations use social media to manage customer or fan relationship management (Luarn, Chiu, Yang, & Kou, 2014). Lastly, social media help support sports sponsorship events, such as making sponsors viral among sports fans. For instance, Los Angeles Dodgers inserted sponsor's messages into the player statute within the stadium. Such an appealing scene made the stadium became a popular geotagged location and also helped the sponsor reach more fans (International Event Group, 2015). To sum up, social media greatly support sports marketing practices, such as for public relations, customer satisfaction and sponsorship management.

In the era of big data where considerable advancements have been made in the aspects of data collection, data storage, and data analysis techniques, data analysts are now capable of processing high volume, velocity and variety data to get insights for business decisions (Beyer & Laney, 2012; De Mauro, Greco, & Grimaldi, 2015; Qiu, Wu, Ding, Xu, & Feng, 2016). Social media data are one of the sources that are widely used for data analysis owing to their characteristics (Tirunillai & Tellis, 2012; Zhu & Zhang, 2010). Firstly, they are now widely accessible to marketers with a low cost. More importantly, social media data are spontaneous, passionate, and temporally disaggregate (days, hours, minutes), which faithfully reflect consumer's attachment, emotions, and opinions towards a

brand (Tirunillai & Tellis, 2014). For instance, many sports celebrity attract millions of global fans to join their social media sites. Or fans do not hesitate to express their voice on social media in some international sports events. These interactions indeed create a massive dataset. As such, how to analyze social media data is now a crucial task for sports marketers and there is a need to investigate the agenda of social media analytics so as to provide implications to both sports marketing researchers and practitioners.

In summary, social media widely influence the landscape of sports marketing - not only do consumers highly rely on them in the consumption process but sports marketers ubiquitously make use of social media for business purposes. With the advent of data analytics, social media data now offer great implications to sports marketers for marketing decisions. Owing to a dearth of attention in the field of sports marketing, in this paper, the authors attempt to investigate how the social media are now employed in different sports settings as well as to review extant literature on social media data analytics.

Social media and sports consumption

Boyd and Ellison (2008, p.211) defined social media as web-based services that allow individuals to construct a public or semi-public profile within a bounded system, to articulate a list of other users with whom they share a connection, and to view and traverse their list of connections and those made by others within the system. Based upon this definition, the first social media platform was introduced in 1997 termed "SixDegrees.com" which allowed users to create their own profiles, to list their friends and

then to surf the friends lists (Boyd & Ellison, 2008). With the development of web technology, there are now various types of social media platforms that provide the aforementioned web-based services to consumers. Kaplan and Haenlein (2010) utilized the level of self-presentation (low vs. high) and that of media richness (low vs. medium, vs. high) to categorize social media into 6 types, including micro blogs (high self-presentation and low media richness), social network sites (high self-presentation and medium media richness, e.g., Facebook), virtual social worlds (high self-presentation and high media richness), collaborative projects (low self-presentation and low media richness, e.g., Wikipedia), content communities (low self-presentation and medium media richness, e.g., YouTube), and virtual game worlds (low self-presentation and high media richness). In short, the term social media encompass six types of web-based services. To date, there are around 12 billion active social media users (Statista, 2017).

Such trend also influences the landscape of sports consumption. In 2017, there are around 747 million users who utilize social media to access sports related contents. For example, Facebook has attracted the most amount of users (442.7 million), following by Twitter (174.2 million), Instagram (95.2 million), and YouTube (34.9 million) (Sportcal, 2017). Compared to the figures in 2016, there was a 26% increase in terms of sports social media users. Among which, Facebook has attracted the most amount of new users (77.3 million) whereas YouTube has the highest increase rate (72%). All of such indicate how social media are entrenched in the sports consumption process at a global level.

The application and analysis of social media in sport

As a result of overwhelmingly phenomena of usage of social media consumption, sport managers in all sectors of sports setting could not but utilize new media platform. To understand how this advanced technology of communication was embraced in the sport sector, this following section presents the application of the social media in various segments of sport industry as well as how they can be benefited from the advanced analysis of mass data.

National governing body

According to the study of usage of social media among national sport governing bodies (hereafter, NSGBs) in U.S., the results indicated that all the NSGBs have their own Facebook pages and 98.4% of which manage their own Twitter pages. Slightly more than half (51.6%) of NSGBs took Youtube. Other social media platforms, such as LinkedIn, Pinterest, FourSquare, and Google+, were also widely utilized. There are two reasons that explain why these governing bodies widely used social media: for sports fan relationship management and marketing communication purposes. For the former, the organization can actively disseminate news related to the organization itself, guide fans how to enjoy the sport, bridge the link between the organization and fans, as well as set forums to create interaction among fans. As to the latter, NSGBs can use social media to increase publicity, both for the organization itself and the sport that it advocates. Consequentially, it is likely for NSGBs to improve their image, to maintain their relationships with the public and press. More importantly, it is also cost effective to achieve the

foregoing goals through social media (Eagleman, 2013).

Event organizers

FIFA World Cup is viewed as the most popular sports event in the world in terms of viewership. Such popularity is fully shown on Tweeter pages. For example, the 2014 World Cup event received approximately 672 million tweets (Billings, Burch, & Zimmerman, 2015). They attempted to analyze complementary content in the World Cup tweet from the perspective of nationalistic. The commentary was divided into three dimensions, including the attributions of success, the attributions of failure and the characterizations of personality/physicality. For example, attributes of success/failure may include playing styles, team poises, playing approaches, experiences, intelligence and fortune/consonance. Characterizations of personality/personality/physicality were categorized into extroversion, introversion, emotion, appearance, size/parts of body and other. They found that the audiences were more likely to be highly identified football fans. These fans expressed much how they enjoy the skills of players rather than fervent patriotism. Audiences made more comments about opponents out of field of the 12 classification distinctions. This may indicate that fans expressed various emotions in the social media environment.

Wimbledon, one of the most prestigious tennis events in the world, attempted to adopt new media while maintaining traditional values as well as new communication models. This event organizer not only create as many contents as they can but also build multiple platforms. They generated three-series video contents. The first type is pre-planned. Some well-known tennis players will be involved in the production of these short videos prior to the tournament. These

videos will be launched for the purpose of positioning. The second type is preemptive. Certain moments are very important for this tournament, including the open match with defending championship at the center court and five championship match at the end of the week. Also, how to connect traditional holidays throughout the year with the tennis event should be employed. The third type is reactive. Some celebrities come into the game and interact with any given event person. This scene should be very valuable content. This means that the event organizer should be ready for such things. In terms of multiple platforms, the tennis event organizer utilizes Snapchat, Periscope, and Instagram. Snapchat is used for creating a short videos with some special guests/celebrities on site. Periscope is aimed to bring tennis heavyweights a behind-the-scene tour so that fans would be surprise the role play of these tennis heavyweights. Instagram was used to cover unique aspects of the tennis amenity as well as infrastructure which enrich the experience of the heritage event (International Event Group, 2017a; International Event Group, 2017b).

Running-mania is widespread all over the world. More and more running race was created for different markets. The Fun run aims to attract new runners to enjoy the race within a very entertaining atmosphere. The Color run was introduced to Taiwan in 2013. Its fan page accumulated around 130,000 followers within 6 month's time. Its content, including messages, photos and videos, did attract positive responses. Viewers were willing to share these creative contents. Live streaming services enabled the event organizer to transmit delightful and festival-style event simultaneously (Chiu & Hsiao, 2014).

Professional sports team

It is evident that professional sports leagues in various continents make use of the social media boom as well. Sigüencia, Herman, Marzano, and Rodak (2017) showed that only nine of 16 football teams in Polish Top League utilized the Instagram in 2014. The number has been increase to 15 in 2016. It also indicated that number of photo posted thru Instagram was skyrocketed in certain seasons as well. Sigüencia et al. (2017) concluded that these teams only posted a lot of photos and short videos for promotion purposes but there is a need to put more effort to create interactions with their fans..

Social media seem to be a valuable marketing tool for non-mainstream professional sports leagues as most of the mainstream media do not show much interest to cover their events. Therefore, these secondary professional sports leagues have to take this opportunity to promote themselves through the use of social media. For example, despite that the Australia netball Championship has a huge number of female participants and spectators, it does not have much exposure from the mainstream media (Vann, 2014). As such, Vann (2014) investigated how the Australia netball federation utilize Twitter helps to promote their events. This study determined the performance indicator to investigate the efforts by these women's teams, including the number of tweets in the dataset, the number of unique users contributing to the data set, the percentage of original tweets in the data set (i.e., tweets that are neither @replies nor retweets), the percentage of genuine @replies in the data set (i.e., @replies that are not retweets), the percentage of retweets in the data set, the percentage of tweets in the data set that contain URLs. Vann also examined interactive format from the team's as well as the

fan's perspectives. First, teams can initiate direct conversations (@replies), the promotion of existing message (tweets with URLs), tweets contributing original content (original tweets), or the reproduction of tweets posted by someone else (retweets). Original Tweets, @replies, and Retweets Original tweets were the most frequently posted type of tweet by all teams, followed by retweets and @replies

Most sports teams would post new information through Twitter pages, ensuring it is an outlet where fans can gain information that is not otherwise available and enhance their transmedia sports experience. Second, hashtags have been employed to make a connection among fans. Once sport-event related hashtags are initiated, interaction among fans would begin and lead to live experience. Vann (2014) pointed out fans tweeted more frequently during breaks, such as time outs and between quarters. These breaks allow people to switch their attention from the field to social media. Undoubtedly, social media play a complimentary role with traditional media and help team disseminate information to a further extent.

Ko, Yeo, Lee, and Jang (2016) addressed that sports fans tend to interact with others when watching sports events. Social media seem to play a facilitating role to make communication easier among fans. In general, chat messages consist of a game ID, user ID, chat message text, favorite team (i.e., the team selected when the user posts a chat message), and when the message is posted. Indeed, these contents form the base for further social media analytics. They studied the chat interaction in live streaming professional baseball games in Korea and identified the factors that affected chat interaction while viewing games. First, pre-game factors had a stronger

influence than in-game factors. For instance, the chat interactions were more intensive when two teams had won a number of their recent games. Or the closer the team was to the top of the rankings (e.g., first- or second-ranked team), the more interactive the viewers were. Also, a number of interesting plays associated with the outcome of the game would initiate more chat interaction among the in-game factors. This study also mentioned that chat format would also be varied based upon people with different level of involvement. For instance, the pre-game factors were more influential for loyal fans whereas in-game factors were influential for the causal games. Such a finding initiated further research issue to analyze different types of chat interactions in various online sports-viewing services.

Sport event delegations

Taipei Universiade in 2017 was the biggest multi-sports event that this nation has ever been organized in Taiwan. More than 140 delegations attended this event. To promote the delegations as well as Universiade in its own nations, some embassy offices in Taipei used its official Facebook to update team-related events. American Institute in Taipei (AIT) and Netherlands Trade and Investment Office (NTIO) were very actively promoting its delegations. The former disseminated 51 news articles from the end of July and Early September whereas the latter issued 61 news articles from the beginning of the August to the early September. Through analyzing contents from AIT and NTIO's Facebook pages, it found that the majority of information prior to the opening ceremony was related to the introduction of the individual sports team whereas many updates were game results after opening ceremony. Indeed, the introduction of the teams received the attention

from local media which created media coverage. This means that Facebook had a positive effect to boost media exposure. Furthermore, AIT launched a delegation quiz in its Facebook page which received around 350 comments, the most popular one among all their posts. Facebook also reveal the information related to community visit by USA delegations. This may demonstrate its good will to the host city. Also, hashtag for both Facebook was used. To enrich the content, both offices also disseminated relevant photo and video. To sum up, Facebook really played a helpful role to promote its national delegation in the host city region as well as improve the visibility of these embassy offices.

Athletes

Social media can be an effective communication tool for athletes, including retired athletes. The popularity of the athletes can be measured through social media metrics, such as the of followers and video viewers, the amount of share and comments. Neymar, a Brazilian professional soccer player who is valued at 80 million, has 67 million followers on Twitter and Facebook, attributed partly to his high online efforts. He participates regularly in online discussion (approximately 40,000 tweets on his Twitter profile) and posts frequently (approximately 2,600 updates on Instagram) (Korzynski & Paniagua, 2016). Number one female badminton player, Tai, decided to play for national team, rather than for World Championship, and then obtained the gold medal in Taipei Universiade. Followers of her fan page were doubled from 150,000 up to closely 300,000 with one month (Sports Center, 2017). In addition, David Beckham, a British soccer player, used to be the most popular individual on Instagram ever. This retired English captain is the fastest to earn one million followers in his social media debut. Also, his account is the fastest ever

to reach 5 million followers within 3 days (Dewhurst, 2015).

To fully take advantage of social media, Korzynski & Paniagua (2016) indicated that social media enabled athletes to play an influential role in three aspects: Informing, interacting and inspiring. Informing means that athlete should be willing to share personal information or off the field events to keep interest level of followers. Interacting addressed that athletes are allowed to interact with fans directly and then increase visibility or popularity in which may lead to attract prospective sponsors. In addition, inspiring stated that athletes demonstrated their positive characters on social media and motivated or encouraged followers to share. Korzynski & Paniagua concluded that athletes should manage fan relations though the use of social media and lead to improve its market value in the long run.

Furthermore, Geurin (2016) addressed that social media is increasingly common for elite athletes and created several benefits for them as well. In order for athletes to utilized social media practice effectively, Geurin formulated a seven-step strategic guide. This study also mentioned that use of social media enabled athletes to build a personal brand, search for prospect sponsors, interact with stakeholders and deepen fan engagement.

University sports

A study by Stoldt (2012) about perceptions of athletic administrators upon influence of social media on U. S. college sport stated that social media played an important and inexpensive communication tool with external publics and help colleges developed long-term relationships with key publics. In addition, colleges were required to response in a rapid manner.

To further understand how college sports embraced the social media, Wallace, Wilson, and Miloch (2011) examined the NCAA Organizational sport page and Big 12 Conference Athlete Department pages. Their study presented several important findings. First, college sports used Facebook features to promote linked sources to Web sites outside of Facebook. Links allow users to communicate an outside Web link to consumers while they are navigating Facebook content. Other information in the Facebook was categorized as status update, picture, video and notes. Secondly, Through posting plenty information related to star players, performance of the team, the athletes department attempted to present its product as well as experience. Also, The NCAA pages emphasized upon commitment and organization attributes in which echoed the overall brand image of student-athlete as well as organizational mission of the NCAA brand. Thirdly, college sport departments were able to build lasting relationships with fans and provided fans a real-time interactive environment with introduction of various sporting content.

Sponsor

Nike has been a long-term sponsor for various properties many years and built very strong product line in some sports, such as basketball. Nike launched fanpage of Nike basketball Taiwan in 2010. The number of followers reached 100,000 in 2012. The Top One-Hundred fanpage report mentioned Nike was the only sports brand in the list. This report revealed that Nike Basketball Taiwan ranked 5th in the average engagement rate. (Lee, 2013). Chang and Chen (2014) analyzed its fan page and found that its content could be categorized into five areas, including high school basketball players, high school basketball teams, tournament

information, product information, and information related to High school Basketball League. Their study showed that in general each post would receive 1,357 times of "like", 15 "comments" and 58 times of "share." However, followers may behave somewhat differently towards the type of the message. The product information received the most followers. Tournament message seemed to enjoy the most comment. Followers would share team information the most.

Sports drink is one of the most active sponsorship in sport. Gatorade, Pepsi's sports drink brand, created a new product line based upon the needs of various customer segments after recent recession. They attempted to meet the needs of three major segments, including the teen, senior and fitness athletes markets through introducing the G series, G Series Pro and G Series respectively. To promote their new product line, Gatorade initiated a series of white and black videos that featured with celebrities, such as Kevin Garnett, to attract consumers of the same lifestyle and values. Also, an ad campaign was launched to educate customers to appreciate the ingredients of the new product. For young athletes, this company created a social media campaign to establish a mission control with six screens. This allowed the corporation to deepen consumer relations and monitor feedback of customers. Gatorade Facebook receive more than a million "likes", and has obtained 500, 000 new followers compared to just 200,000 in the previous year. (Datamonitor, 2011).

Also, Do, Ko, & Woodside (2015) examined the impact of social media in sports sponsorship of brand upon brand consumers' congruity and relationship quality. The results showed that social media activities of brands' sports sponsorship improve its brand image. Their study

pointed out that age as well as gender act as a moderating variable in the relationship between brand's sports sponsorship in social-media activities and the brand-related assets.

These aforementioned examples not only presented the widely adoption of social media network, but also demonstrated its multiple functionality as well as some practical achievements. It was concluded that utilization of social media can play several functions, including public relations, sales promotion, sponsorship solicitation, brand image enhancement, and value-added entertainment, and new consumer acquisition.

Social media analytics and business decisions

With the advance of the information science and the data analysis techniques, marketers can now capture consumer's activities on social media sites and make a big dataset. Then, they can get insights from these data to support various business decisions, such as marketing communication campaign management, consumer's voices probing, and sales predictions. In this section, the authors introduce the key metrics and analytical techniques that help find insights for these business decisions.

Marketing communication campaign management

Consumer's activities on social media sites provide great insights for marketers for managing marketing communication campaigns. More precisely, marketers can examine the traffic and engagement level of their social media sites. Below address the key metrics that marketers use when capturing these insights.

As to assessing the traffic level of a social media site, marketers use the page view and unique visitor metric (Web Analytics Association, 2007). More precisely, the former is defined as the amount of visits that a social media site has generated in a period of time, which also signals the amount of "impressions" that a social media site has generated in the media planning practices. The unique visitor metric is defined as the number of visitors, which captures the capability of a social media site in "reaching" its potential consumers (Sissors & Baron, 2010; Web Analytics Association, 2007). The two metrics help sports marketers to estimate the effectiveness of their past marketing communication campaigns. Furthermore, marketers can also capture how effective their social media sites are in attracting potential consumers and in supporting their future marketing communication campaigns.

As to assessing how effective a social media site is in engaging consumers, the following metrics, visit duration, bounce rate, viral rate (for Twitter pages), and engagement rate (for Facebook Pages), are widely applied by marketers (Clifton, 2012; Sterne, 2010; Web Analytics Association, 2007). With the aid of information technology, marketers can track how long do consumers stay on their social media sites on average, termed visit duration (Web Analytics Association, 2007). The longer the time that consumers stays on a social media site, the more likely such site is effective in engaging consumers. Yet, there are other facets about measuring customer engagement in social media. For instance, marketers also use the bounce rate metric to identify the percentage of total visits which are single page view based (Clifton, 2012; Web Analytics Association, 2007). As such, a low bounce rate indicate that a social media site has

attracted the right type of audiences and provided the right type of contents so that these audiences were engaged. Specific to Twitter and Facebook pages, marketers also calculate the viral and engagement rate to probe the level of engagement. More precisely, the viral rate is calculated by dividing the aggregation of the numbers of retweets by the number of followers of a twitter page. The engagement rate is calculated by dividing the sum of numbers of reactions, comments, and shares with the total reach of the whole Facebook site/ an event page (Clifton, 2012; Sterne, 2010).

In summary, the aforementioned metrics help capture the level of traffics and engagement that a social media site has generated. Sports marketers can thus use these insights to monitor the effectiveness of their past marketing communication performance. Furthermore, they can estimate how effective their social media sites are in creating impressions (e.g., attracting active potential consumers for their future campaigns) which also helps to plan their future marketing communication campaigns (Clifton, 2012; Sterne, 2010; Wilson, 2004).

Consumer's voices probing

Analyzing consumer's comments in social media also helps capture insights to support business decisions. Such analytical work is termed sentiment analysis that denotes using programming language to classify, cluster, quantify, and visualize the themes behind consumer's comments in social media (Liu, 2012). Conducting sentiment analysis generally involves the following processes. Firstly, data analysts need to filter out non opinion-led statements - where consumer's voices reside. Then, they need to use programming language to classify or cluster the data. Lastly, data analysts label the social media contents based upon the

classification criteria or clustering characteristics and then quantify these "labels". (Aggarwal & Zhai, 2012; Allahyari et al., 2017; Nisbet, Elder, & Miner, 2009). Below address the data classification and clustering techniques.

As to the data classification techniques, there are three major approaches, the machine learning, the lexicon-based and the hybrid approach, which are widely used by data scientists (Beigi, Hu, Maciejewski, & Liu, 2016; D'Andrea, Ferri, Grifoni, & Guzzo, 2015; Hotho, Nürnberger, & Paass, 2005). The machine learning approach involves setting a "pattern" (e.g., computer learning algorithms) to predict the polarity of the texts. Within such approach, data scientists have developed a number of methods to predict text polarity, such as the Bayesian Networks (using probability classifiers) and the Support Vector Machine method (using linear classifiers). As to the lexicon-based approach, data analysts utilize a predefined list of words (e.g., through dictionaries or corpus) as a basis to count the number of positive/ negative words in the text so as to classify the texts. To date, both the machine learning and lexicon based approaches are tested to have satisfactory performance in text classification (Beigi et al., 2016). There are also a number of software packages developed based upon these methods to support sentiment analysis, such as SenticNet (machine learning based) and Senti WordNet (lexicon based) (D'Andrea et al., 2015). In the recent development, data scientists also propose the hybrid approach, integrating lexicon while setting of machine learning pattern, to improve the effectiveness and efficiency of the sentiment analysis process (Behera, Roy, & Dash, 2016; Lalji & Deshmukh, 2016).

Once the texts are classified, data analysts can quantify the amount of emotions in social media (e.g., the number of positive or negative comments) in a given time period and across time periods. Such information can help brand managers to monitor consumer's voice towards their brand performances. Further analyses can also be undertaken to visualize the sentiments, such as making perceptual maps to illustrate the strength and plurality of consumer's voices across different brands (Beigi et al., 2016; Misopoulos & Mitic, 2014).

Data clustering process is different from the aforementioned data classification process. More precisely, data clustering is to group contents based upon similar characteristics whereas data classification is to use a pre-defined rule to categorize social media contents. As such, clustering social media data helps marketers to find the latent themes within consumer's remarks.

Regarding the data clustering techniques, there have been a number of algorithms that data scientists use to cluster social media contents, such as the K-means clustering and the Latent Dirichlet Allocation (LDA) techniques (Aggarwal & Zhai, 2012; Allahyari et al., 2017; Nisbet et al., 2009) and have been some innovative works in the academic field that demonstrate how to cluster social media contents to generate insights. For instance, Tirunillai and Tellis (2014) analyzed consumer reviews from multiple social media platforms (e.g., cnet.com and zdnet.com) between 2006- 2010 to probe the key factors that constitute product satisfaction. With the use of the Latent Dirichlet allocation framework, they managed to find the latent themes regarding what consumers consider when making a purchase (e.g., mobile phones and computer). Furthermore, they use these insights to create a perceptual map that

illustrates what brand was seemed as having the best performance compared to its competitors by consumers.

In short, analyzing consumer's comments in social media sites also provides rich information for business decisions. As such, it is suggested that there is a need for sports marketers to systematically examine consumer's comments from their social media sites. They can apply the data classification techniques to capture how their products or services are perceived in consumer's minds (e.g., positive or negative as well as the exact brand associations). Furthermore, they can also apply the data clustering techniques to find the latent needs that consumers want from their product or services (e.g., the kind of atmosphere or experiences that sports consumers are looking for when attending a match).

Sales predictions

Consumer's comments on social media sites, once quantified through sentiment analysis, are found as a strong predictor to estimate a brand's future sales figures. In the marketing academic field, such agenda is termed the electronic word-of-mouth (eWOM) elasticity which has received a considerable amount of attentions (Bollen, Mao, & Zeng, 2011; Oliveira, Cortez, & Areal, 2016; Tirunillai & Tellis, 2012; Zhu & Zhang, 2010). The analytical work generally requires the following steps. Firstly, there is a need for data analysts to integrate various type of sources, such as a brand's social media data, sales figures, and marketing budgets, into a giant dataset. By doing so, data analysts can obtain the key parameters for the modelling purposes (e.g., using econometrics techniques) where possible exogenous variables can be controlled to increase research validity.

In extant marketing literature, researchers are currently investigating what type of eWOM metric (e.g., on a volume or on a valence basis) best predicts a brand's sales figures as well as in what marketing context that metric has an higher predictive power. The initial conclusions are as follows. Firstly, researchers verify that sales figures can be predicted either on a volume (the amount of posts in social media sites) or on a valence (the polarity revealed by consumer's comments) basis. Yet, there is still a discrepancy regarding which one is relative more predictive to sales (Rosario, Sotgiu, Valck, & Bijmolt, 2016; You, Vadakkepatt, & Joshi, 2015). Secondly, variance among consumer's comments (e.g., consumers rate a product in an inconsistent way) is found can negatively influence sales figures, in particular to those brands who are not well known to consumers. Thirdly, product types moderate the effect of consumer's social media comments on sales. More precisely, the positive impact of eWOM on sales is stronger in service, hedonic and high financial risk based product categories compared to the counterparts (Rosario et al., 2016).

These initial conclusions provide implications both to the sports marketing academic and practitioners. On the one hand, they indicate the importance of social media in sports marketing management as sports products or consumptions by and large are hedonic based (Shank & Lyberger, 2014). As such, a successful social media sites management (e.g., having a huge number of sports consumers/fans who are highly active and generating positive messages) is likely to boost a sports brand's sales figures. On the other, they also shed a new light on sports marketing research. Firstly, due to a lack of empirical evidence, it is to be investigated that what types of sales (e.g., game attendance,

related merchandise, sports products) is sensitive to consumer's comments from social media sites? Secondly, what type of metric (on a volume or a valence basis) is relative more predictive to what types of sales figures is also needs to be investigated. Lastly, there is a need for future researchers to consider other types of endogenous variables in the modelling process owing to the unique feature of sports industry. For instance, team identification and team performance could possible be two important exogenous variables that sports marketing researchers need to consider in the modelling process (Gray & Wert-Gray, 2012; Wann & Branscombe, 1993). Their impacts have not been systematically examined in the extant marketing literature owing to the uniqueness of the sports marketing industry.

Conclusion

The convergence of advanced information technology and communication has created tremendous impacts upon sports marketing and sports consumption. Such agenda has also received a considerable amount of attentions from the research community, as such, there have been 123 research articles centering on the agenda of social media form 29 journals in the timeframe between 2008 (earliest found) and 2014 (Abeza, O'Reilly, Séguin, & Nzindukiyimana, 2015).

Extent literature suggests that social media sites are highly involved in contemporary sports consumption practices. As to the former, there have been around 747 million sports consumers/fans who are engaged in sports based social media sites (Sportcal, 2017). Their "footprints" can be found in various types of platforms, such as micro blog based sites, social networking based sites (e.g., Facebook), collaborative based

sies (e.g., sports forum), and content communities based sites (e.g., YouTube) (Kaplan and Haenlein, 2010). In the era of big data, sports marketers can now store and analysis a gigantic volume of consumer's data from social media (Beyer & Laney, 2012; De Mauro et al., 2015; Qiu et al., 2016). These data are of great values to sports marketers as they reflect consumer's spontaneous emotions, and opinions towards a sports brand in great details (Tirunillai & Tellis, 2014).

As to how social media impact sports marketing practices, their roles in supporting promotional activities for sports sections are well recognized. More precisely, sport organizations, including national governing bodies and some non-mainstream professional sports leagues, view social media as a very important publicity tool to serve as a bi-lateral communication tool with their stakeholders. For instance, owing to a high level of transmission capacity, live broadcasting on social media such as Youtube and Facebook live streaming, are now a useful tool to attract the attentions from consumers. In addition, social media are a very useful tool for sports sponsorship - professional sports teams utilize social media as part of their sponsorship campaigns. Lastly, in light of real-time interaction, it has found that many sports teams use social media to encourage sports fans to express their voices, such as through Twitter and Facebook with the uses of hashtags. This design would allow sports organizations to collect and analyze the feedback from consumers, where these insights can be further applied to for customer relationship management and product development. In addition, hashtags, a unique function in social media, helps setting keywords to allow consumers to invite others to join discussion.

The advent of analytics techniques makes social media further important to sports marketing practices. There have been a host of techniques to help sports marketers to transform social media data in supporting various business decisions. More specifically, sports marketers can analyze the traffic and engagement levels of their social media sites so as to monitor and plan their existing and future marketing communication campaigns. In addition, they can conduct sentiment analysis to probe how consumers feel about their products and services (e.g., positive or negative, the classification process) as well as to discover consumer's latent needs (e.g., what makes consumers engaged during the game, the clustering process). Lastly, the quantified results of consumer's comments in social media, such as the amount of posts and the polarity of the comments, also supports predicting future sales figures (e.g., Bollen et al., 2011; Oliveira et al., 2016; Tirunillai & Tellis, 2012; Zhu & Zhang, 2010). Recent research reveals that the amount of posts made by consumers as well as the sentiment resides in consumer's comment positively predict a brand's sales figures. Such predictive power is particular strong in service, hedonic and high financial risk based industries - where sports commodities and services operate (Rosario et al., 2016; Shank & Lyberger, 2014; You et al., 2015).

This study also proposes several implications for sports marketing researchers and practitioners. As to the former, firstly, despite that sports organizations in Taiwan have already deployed social media in their practices, there is a need of further research to investigate the objectives as well as motivations of using social media in professional teams sports as well as national sports governing bodies. Secondly, as social media are now an important tool for

sponsorship inventory, the authors also argue there is a need for further research to investigate how they can facilitate the sponsor's promotional campaigns as well as measure the impacts that these campaigns generate. Thirdly, to understand the effectiveness of social media is an essential issue while social media practice is prevalent. This means that more research efforts should be spent in this realm. Fourthly, the authors also suggest sports marketing researchers to further capture the impact of endogenous variables (e.g., team identification and team performance) in the way they use social media data to predict a brand's sales performance sales, which is currently understudied in the contemporary literature.

As to the implications to sports marketing practitioners, the suggestions are as follows. First, the effectiveness of a social media site is based upon its contents. As such, sports marketers need to offer customized contents, with the use of hashtags, to sports consumers so as to increase the level of traffics and engagement. Secondly, sports marketers need to develop a monitor mechanism in responding consumer's voices in social media which is essential to create a high level of customer satisfaction and fan relations.

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社群媒體在運動行銷應用之探討

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摘 要

緒論：近年社群媒體的無所不在讓多企業感受到其魅力，運動行銷人員也認同其價值並應用在許多層面，同時，大數據時代的來臨也提供社群媒體內容分析的技術已進一步了解使用者的社群媒體的消費行為，針對此，本文試圖分析社群媒體在運動產業較常見的應用方式以及探討社群媒體可應用於運動商業領域的社群媒體分析技術。**方法：**本文主要是透過相關文獻回顧及探討。**結果：**顯示社群媒體可以提供多元的功能，首先，社群媒體是促銷媒介可擴大宣傳成效。第二，提供即時傳播服務以提升內容娛樂價值。第三，雙向互動可彙整消費者建議。第四，社群媒體可納入贊助權益及活化規劃元素之一。另外，社群媒體有效地群聚消費者。針對社群媒體內容分析技術部分，本文建議運動行銷經理人針對其所經營之社群網站進行流量 (traffic analysis)、參與度 (engagement analysis) 以及情感分析 (sentiment analysis)。分析結果將有助於管理行銷溝通成效、了解消費者的意見氣候以及預測未來銷售。**結論：**基於社群媒體使用族群龐大，許多運動組織也紛紛提出行銷相關應用，而消費者在使用社群媒體時產生了巨量資料，這些巨量資料形成的大數據分析的基礎，另藉由現今資訊分析的技術可以探討社群媒體所產生的資料並作為了解消費者使用行為及預測分析的依據。最後，本文也提出學術界及實務界之建議事項。

關鍵詞：社群媒體、社群媒體資料分析、大數據