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## Online Social Network Management Systems: State of The Art

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### Abstract

A large number of Social Media Management Systems (SMMS) have been developed to maintain multiple accounts over different online social networks. Each system has pros and cons and can be more or less useful depending on its features and cost. This paper presents a state of the art of the existing platforms for managing online social networks. The state of the art is structured with a framework that guides the analysis of each social media management system according to its own characteristics and the characteristics of the online social media content that the system helps to manage. The state of the art has two outcomes: a comparative analysis of the presented SMMS and a collection of requirements for what is believed to constitute a "good" system.

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*Keywords:* Online Social Networks (OSNs); Social Media Management System (SMMS); Evaluation Framework

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### 1. Introduction

Currently, online social networks (OSNs) are one of the most important sources of information. They have affected many life aspects on both the individual and organizational levels, especially in business, education, health care, and politics<sup>1-3</sup>. Many social media platforms are widely used including Facebook, Twitter, LinkedIn, Instagram and Google+; users have many different accounts on these platforms. Sometimes managing one social media account is very easy and quick. For example, monitoring and managing news feed posts in Twitter or Facebook is straightforward. However, in many workplaces, at least one account exists for each platform. Managing these accounts can be a time consuming; in large organizations, account management may also become resource-consuming<sup>3,4,5</sup>. Handling a large

number of such OSNs as YouTube channels, Facebook pages, and Twitter accounts has become a serious problem for many companies.

Therefore, it is difficult to manage multiple OSNs accounts without an accompanying tool because of the dynamicity of the online social networks, the constant changing of their content, and, even if one is monitoring them 24/7, the user is bound to miss something. Social media management tools aggregate the management of these platforms into one platform, one login, one system, and one centralized location. Publishing status updates and other content and managing the conversations on these networks are important aspects of a particular social management tool called the social media management system (SMMS).

There are many social media management systems available in the solutions landscape. Altimeter Group<sup>6</sup> identifies and labels over 150 social media monitoring solutions and over 30 specifically defined Social Media Management Systems. One issue with these tools that Altimeter identified as Social Media Management Systems is that there is no standard or consensus on their functionalities. For instance, WildreApp<sup>7</sup> offers a very narrow sliver of functionality (network-specific engagement tools). Indeed, any enterprise needs a SMMS to manage their social media accounts well and efficiently. However, the diversity and lack of consensus in SMMS functionalities lead to a problem for the decision makers to determine what platforms and tools they should be using.

In this paper, the available work on social management systems will be reviewed. Additionally, the most important tools that claim managing multiple social media accounts are reviewed. The existing candidate tools are evaluated and ranked according to the evaluation results. The major contributions of this paper are as follows:

- This survey is the first research in this domain where all available tools that claim managing multiple social media accounts are examined.
- The most important features and attributes that cover the full functionality of the best SMMS platform are identified and examined.
- Twelve SMMSs<sup>8-19</sup> were considered to be discussed in this paper with the following two goals: to emphasize their similarities and differences and to identify the requirements for the "best" SMMS. To achieve this, the research strategy was to develop a structured analysis framework that guides the comparison of these social media management systems.

The remainder of this paper is organized as follows. Section 2 presents available previous studies, reviews and surveys on social media management systems. In section 3, an evaluation framework is proposed to assess those systems. Then, the evaluation results are presented and various issues and suggestions are discussed in Section 4. Finally, Section 5 presents the concluding remarks.

## 2. Previous studies

Few domain research studies have concentrated on SMMS particularly. Nevertheless, the process of evaluating and selecting the appropriate SMMS stem from the multi criteria decision-making analysis technique associated with the research, helping to evaluate the available SMMSs that pull information from multiple OSNs to enable users to manage their social networking world. In this research, the review concentrates on two main areas, a Social Media Management System and Multi-criteria Decision making methods.

A recent study<sup>20</sup> defines social network aggregation (SNA) as a wise solution to the above problem. SNA is the process of collating, aggregating and organizing data spread across multiple social network services. Based on this definition, the major functions of SNA are to integrate the various social data, services and activities in a certain way where the user is not required to login to each social network and separately perform the same social activity. The authors provide a review on different SNAs and its social network integration issues, exposing criminal behaviors in e-commerce, computer intrusions identification, detecting health problems, and analyzing satellite images.

Research by Jason Falls<sup>21</sup> entitled "The State and Future of Social Media Management Solutions" reviews an analysis of more than 30 SMMS tools. He finds that none of them do the same thing, or provide a clear definition of what are the functions that the SMMS should do. Based on this study, the author determined the major eight functions that should exist in any Social Media Management Solution including monitoring, publishing, engagement, organizational management, lead and conversion tracking, measurement, customer relationship management and social advertising management. As a part of the article, he suggested that customers should push the SMMS vendors

to make SMMSs more complete and holistic by creating a systems and tools where customer can manage all digital marketing in one place.

Generally, none of the previous studies discuss how to choose the right SMMS tool regarding user needs and preferences. Additionally, many of studies fit the requirements and needs of how to select the best tool. On the other hand, a report by Shoutlet Inc.<sup>22</sup> introduced a systematic guide report on building appropriate SMMS tools based on users goal. This report is a good starting point for building an optimal SMMS platform.

### **3. Proposed evaluation criteria framework**

To help select the best SMMS, two important factors must be determined. Firstly, the candidate systems must be identified. For this purpose, systems were selected according to different factors such as the number of users, downloads, users review, partners and report from Altimeter<sup>6</sup> along with the tool continuity in the business world. Secondly, comprehensive, reliable, and more professional features and attributes must be identified to evaluate SMMSs. In this respect, the criteria for choosing SMMS are extracted according to the following five main attributes: online social network properties, customer services and support, security attributes, financial considerations and vendor statues and experience. In the next subsection, the two main elements of the framework are discussed in detail, the candidate systems and the extracted features.

#### *3.1. Social Media Management Systems*

In this section, we reviewed twelve Social Media Management Systems. Those tools include: HootSuite<sup>8</sup>, Buffer<sup>9</sup>, CrowdBooster<sup>10</sup>, IFTTT<sup>11</sup>, Oktopost<sup>12</sup>, SocialBro<sup>13</sup>, SocialFlow<sup>14</sup>, SocialOomph<sup>15</sup>, Spredfast<sup>16</sup>, SproutSocial<sup>17</sup>, Tweepi<sup>18</sup> and TweetDeck<sup>19</sup>.

#### *3.2. Evaluation Features and Attributes*

After a deep study of the systems used to manage social networks, the most important features found to influence the best choice are the six main attributes. First is the ability to dealing with online social network properties. Second, customer service features are an important factor to guide and help users and clients when using a system. Thirdly, security attributes are important for providing adequate protection and security as the highest priority for different customers and agencies when using SMMS. Security features are also important factors in this study to compare between different systems to maintain the integrity, confidentiality of information and user verification. Fourthly, operational attributes include concerns regarding system usability and its ability to integrate with other systems and platforms are important to consider. Fifthly, financial considerations examine the quantitative data such as the price and service plans. Sixthly, vendor status and experience are measured by the public data and the vendor claims regarding resources and services available for product development and overall stability.

### **4. Comparative Analysis within Evaluation Framework**

The following sections summarize our analysis of the twelve SMMS platforms based on the proposed framework.

#### *4.1. Online Social Network Properties*

The majority of the considered SMMSs aim at covering all of the properties of social networking. All platforms support at least four online social networks except those that support Twitter only. The speed at which information flows on Twitter can be overwhelming. According to Twitter<sup>23</sup>, 500 million tweets are sent per day from more than 300 million monthly active users. Secondly, 80% of active users on Twitter tweet from mobile devices. Moreover, Twitter APIs are available with many services and are more flexible than with any other social network. Figure 2 provides a visual representation of the number of social networks services as well as the number of features supported by the studied SMMS.

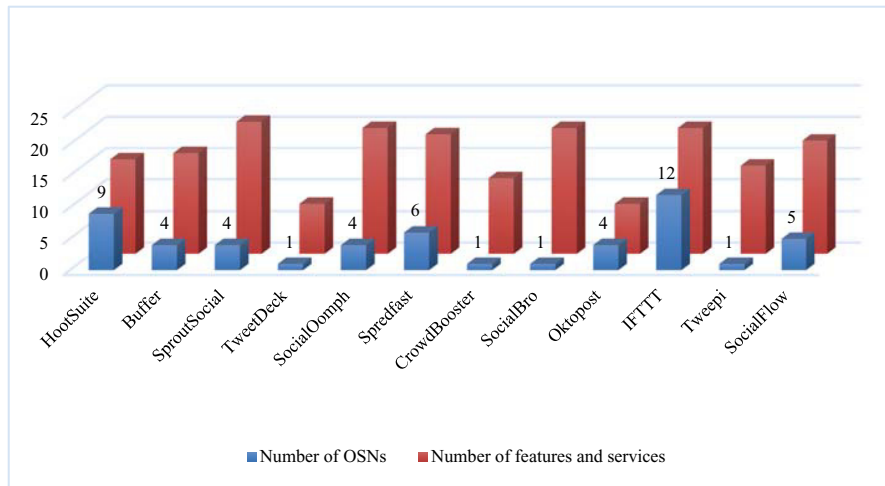


Fig. 1. Number of Online Social Network and Features Supported by the Reviewed SMMS

The number of features and services provided by the reviewed SMMSs vary from one platform to another regarding the service package. For example, Hootsuite provides 15 full services (such as unlimited enhanced analytics reports, unlimited message scheduling and unlimited app integration) under its enterprise package plan. This type of plan is appropriate for businesses, organizations, agencies and governments. In addition, Hootsuite offers two other plans: the Pro features plan with 15 advanced services and a free features plan that has only seven basic services. TweetDeck, however, offers only one free features plan with eight services to manage a Twitter account. On the other hand, IFTTT offers entirely free features to manage a huge number of applications and services. Typically, most of the reviewed SMMS offer free features that allow users to create numerous social network streams and view them in a friendly interface with the ability to dispatching messages to multiple networks simultaneously. Nevertheless, asking for extra features can be expensive, and a user will have to upgrade a plan to take advantage of these features.

Creating analytic-rich reports for clients is a very crucial task and should be available in any SMMS<sup>35</sup>. Unfortunately, some of the SMMS such as TweetDeck, Tweepi, and SocialOomph do not provide any analytics or reporting features. Impressively, IFTTT uses Google analytics, spreadsheets, etc. to generate reports and display detailed analytics info and statistics. The rest of the studied SMMS allow users to generate different analytics reports.

Scheduling is supported in all SMMS platforms except Tweepi. Meanwhile, IFTTT use its ultimate automating features to schedule posts within a Google calendar. In Hootsuite, user likewise have the option of using the auto scheduler that gives the app control of posting schedule, then controlling when it posts user content. Users can use the “Scheduler” to view scheduled messages and select to view and manually repost selected archived updates (depending on the features package plan, e.g., on Pro plan, a user can view up to 100 archives). However, most of the studied SMMSs allow users to upload new content and manually schedule the content to go out to one or multiple social accounts at a specific time.

Keeping track of what people are saying on online social media is essential to maintaining a successful account. For many parties, it is important to keep an eye on specific words and phrases that might be part of a conversation, which may also apply to a business. Consequently, listening to people may create opportunities to provide assistance or resources or even to reach out to individuals in need. All of the studied SMMS platforms except for Buffer provide user searches and tracking specific terms; however, these searches are not available to be saved as streams within the tool dashboard. The geo-targeting features depend on tracking and searching services that are provided by SMMS platforms. Almost all SMMSs offer this feature except for Buffer. Overall, each SMMS tool has its pros and cons in terms of features and cost-effectiveness. Certainly, no solution can do it all; however, people tend to gravitate toward low-cost, flexible options instead.

#### 4.2. Customer services and support

In this section, the level of technical support provided by the selected SMMS platforms is examined. To measure this factor, a list of questions was provided to determine the selected SMMS capabilities as follows: does it have a knowledge base, does it provide an online support or chat service, does it have direct phone numbers to support clients, and/or does it have a video tutorials and/or documentation or FAQs? Based on this analysis, the majority of the selected platforms provide different types of support except for TweetDeck, which provides only FAQs and some troubleshooting links through the main Twitter support page.

In general, both HootSuite and Oktopost succeeded to meet all support features while TweetDeck and Tweepi failed to provide more than two types of technical support. Additionally, all of the reviewed tools provide a knowledgebase, which contains expert advice, discussions and comments. Buffer, TweetDeck, SocialOomph and IFTTT do not provide these options.

Direct phone support is provided by almost all SMMSs except IFTTT, Tweepi and SocialBro. Surprisingly, although documentation and FAQs are important, only half of the selected tools publish support contents in the form of FAQs or documentation pages. Sproutsocial, Spreadfast and SocialBro present a resource bag for users that contains many types of guides and case studies. One of the valuable ways to communicate and support users is to provide video tutorials. Most of all selected tools have their own Youtube channels to broadcast tutorials; there are also tutorials uploaded by their users.

#### 4.3. Security Attributes

Social media management systems should be extremely secure due to the sensitivity of the information being managed. SMMS manage different social channels through one dashboard, from anywhere, using almost any device. Logging into this dashboard should be secure based on a multi-factor authentication (MFA) process. MFA is the concept of using many stages of verification. For instance, in two-steps verification, rather than using one step of authentication such as entering a password, one or more further steps are needed to login, such as a text message that the SMMS sends to the user. Five of the selected SMMSs applying the 2-steps verification login are presented; while the other selected tools support only one-step verification.

Encryption is also important to ensure data are secure even in the case of unauthorized access to an account. In SMMSs, encryption can take many shapes such as encrypting sensitive data or using HTTPS for all pages. The majority of the reviewed tools perform an encryption mechanism. In Hootsuite, the security mechanism is the highest among the other SMMSs; it not only provides all-data and link encryption, but it also secures profiles through account provisioning, where the user can share profiles access without sharing passwords.

Maintaining regular backups is another crucial security feature. SMMSs should complete regular backups for user contents and media. According to this analysis, most of the reviewed SMMSs explicitly declare that users can complete data replication except for the four SMMSs. As an example, TweetDeck users can create a backup only for the system configuration but not the data itself. HootSuite has roll out archiving for posts.

Privacy awareness is another measure considered in this study, whether the selected SMMS tools inform customers about how they gather and use client data; furthermore, the SMMSs provide information as to under what circumstances the tool will disclose any user information. All the selected tools provide a privacy policy document to ensure that users understand all of the policies regarding their services.

#### 4.4. Operational attributes

Usability tests were performed on all of the selected SMMS platforms with a number of different participants in the research Chair of Pervasive and Mobile Computing (CPMC-Lab) in King Saud University. At least four social networks were used and posts were completed at least 48 times a week. All aspects were tested from the log in stage to the reporting stage. All of the reviewed tools are easy to use and implement according to the impact on new users. However, only with Hootsuite was difficult with a learning curve to navigate the streams and the sometimes-convoluted interface, due to the large impact its complicated layout has on new users. Hence, Hootsuite provides a vast collection of video tutorials, blogs, and webinars.

However, Hootsuite is the top tool that supports more than four languages, followed by Socialbro and Oktopost. The rest of the selected SMMSs support only English. In terms of supported operating platforms, all of the SMMSs support mobile and web apps; some work as desktop applications such as TweetDeck. With respect to the integration attributes, it is crucial to know ability of the selected SMMS to integrate with a new social media management solutions or any other software. In this respect, most of the reviewed SMMSs offered some integration options except Buffer, CrowdedBooster and Tweepi. However, the integration levels vary from one SMMS to another. For example, Hootsuite offered integrations with CRM, email marketing services, help desk software, marketing automation platforms and web analytics. Additionally, it provides an open API library for integration with other required software. However, TweetDeck and SocialBro offered only one integrated service with marketing automation platforms and email marketing services, respectively.

#### 4.5. Vendor status and experiences

The status of SMMS vendors was examined based on popularity. Although it is hard to measure the popularity of these system directly, many aspects were used to judge each system, such as the official partnership with main OSNs, vendor experience based on how long it has existed in this arena, and whether it supports third-parties by providing APIs, and how many customers do they have.

Each system was tracked to check partnerships with official OSNs. The results showed that the majority of the selected SMMS tools are official partners with one or more OSNs except for IFTTT and Tweepi. No official partnerships with OSNs were found for these platforms. Regarding popular clients, almost all the selected SMMS tools declare the famous brands and clients of their systems except TweetDeck, SocialOomph and IFTTT, who do not publish any information about their popular clients.

Another way to measure the popularity of the selected systems is to compare their customer count. For instance, HootSuite announced more than 10 million users and brands, which is the largest count amongst all of the selected SMMS platforms. Buffer and Tweepi followed in user count with more than one million users of their platforms. SproutSocial and SocialBro have a range of 10,000 to 15,000 users. The rest of the SMMS tools do not declare how many clients they have. Table 1 provides more details on the vendor status and experiences of each SMMS. It is clear that HootSuite, TweetDeck, SocialOomph and Spredfast are the first systems that were funded and started in this area of business.

Table 1. Vendor status and experiences

SMMS platforms	Number of users	Popular clients	OSNs Official Partnership	Support Third-party	Year of launched
HootSuite	10+ millions	Y	Y	Y	2008
Buffer	1+ million	Y	Y	Y	2010
SproutSocial	15000+ customers	Y	Y	N	2010
TweetDeck	N/A	N/A	Twitter	N	2008
SocialOomph	N/A	N/A	Y	Y	2008
Spredfast	N/A	Y	T,G+,inst,FB,in,Pin Tum	Y	2008
CrowdBooster	N/A	Y	Y	Y	2009
SocialBro	10,000+	Y	T	N	2011
Oktopost	N/A	Y	T	Y	2012
IFTTT	N/A	N/A	N/A	N	2011
Tweepi	1+ million	Y	N/A	N	2009
SocialFlow	N/A	Y	T, FB, G+, in	Y	2009

#### 4.6. Financial Consideration

Most of the reviewed SMMSs offer three plans for brands and agencies designed to serve their target customer most effectively.

The free plan can cover enough user needs. For example, TweetDeck is completely free; Hootsuite has a robust free version. However, if a user decides to upgrade to the pro feature, it is still an economical \$14.99 per month. Prices can range from several hundred dollars per month for point solutions to tens of thousands of dollars per month for enterprise-level deployments. Table 2 depicts the two main financial considerations of all studied SMMS.

Table 2. Financial Consideration

SMMS platforms	Type of plans	Price
HootSuite	Free/Pro/Enterprise	F/9.99\$/month/more
Buffer	Small/medium/large	50, 100 and 250\$/m
SproutSocial	Deluxe/ Premium/ team	59, 99, 500\$/mo
TweetDeck	Free	0\$
SocialOomph	Free, Professional, Unlimited	\$17.97, \$14/mo
Spredfast	NA	NA
CrowdBooster	Platinum, Bronze, Silver, Gold	Custom, 9,49,119\$/m
SocialBro	Free, Basic, Professional, Business, Enterprise	0, 13.95, 39, 149/mo, custom
Oktopost	Basic, Basic+, Business, Enterprise	55, 123, 339/mo, custom
IFTTT	Free/ Premium	NA
Tweeipi	Free, Silver, Platinum	0, 7.49, 14.99\$/m
SocialFlow	NA	NA

#### 5. Conclusion

This paper has presented a state of the art on platform of social media management systems, and it reports our analysis of the existing tools and/or comparison features. The analysis shows clearly that no single SMMS that matches all situations: each SMMS has advantages and disadvantages that may change in different contexts.

We believe, based on our analysis, that a "better" platform than the existing ones might be elaborated. Such a platform should satisfy a number of requirements that we defined according to our analysis framework as follow:

1. Cover all online social network features and properties.
2. Provide a robust security and privacy attributes
3. Its operational features cover all aspects of usability, integrations, supporting Multilanguage and work on different platforms at anytime from anywhere.
4. Its vendor should have enough experiences and best practice.
5. Its price plans are reasonable and complete.

In the near future, our research program involves validating this list of requirements, and developing a systematic method with dynamic features to guide the selection and adaptation of social media management system to match at best the situation at hand each time a SMMS platform must be selected.

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