

# Modern Ontology and Deep Analysis of Global Social Networks Exploitation

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**Abstract.** When a computer network connects to a person or organization, it is a social network. However, the study of such computer-aided social networks has not attracted people's attention to human-computer interaction, online interpersonal interaction and computer-aided communication research or small group. In the paper the application of secure social networking methods in computer-mediated communication research was discussed. Also some of the basic concepts of social network analysis were received, these described how to collect and analyze social network data, and show where social network data used to study computer-mediated communications can and has been used. And the what are the basic issues and challenges during these all process. The usefulness of social media methods for computer-mediated communication research was showed, whether in computer-assisted collaborative work, in virtual communities, or with more dispersed interactions with people.

**Keywords:** Social Media, Computer Networks, Social Networks, Internet Media, Digital Marketing Trend.

## 1 Introduction

This paper introduces the social network and the overall structure of the Social Media. Social networks have become very popular during last 10-15 years because of the increasing and affordable nature of innovative Internet devices like PC, laptops, mobile gadgets [1], and other new popular hardware tools. This is evidenced by the growing popularity of many online social networks such as Facebook, Twitter and LinkedIn (networks are different in different states). Such a social network should lead to a huge network-centric data explosion in various scenarios. Social networks can be defined in the context of systems (for example, Facebook is designed for social interaction), or defined for other websites (for example, Flickr) created for different services such as content sharing, but also allows for extension levels social interaction [2].

## **2 The Latest Social Media Statistics of Consumer Adoption and Usage**

Social networks are now very mature, with the core of a “big five” network that doesn’t change much every year. However, as we will see in this paper, the most popular social media sites depend to a large extent on the level of use of different countries and demographic data. Understanding these differences in the popularity of different social networks is important for a specific audience. When we compare the most popular and actual social networks, it's best to look at them based on the usage of your active account, but not the quantity of user accounts [3]. In this summary we also can see that some social networks are growing faster than other social networks, while other social networks are declining.

### **A. Social Media Stats Update of 2019**

Based on the top ten sources of recommended digital marketing statistics, we will post this news in 2019 based on the latest statistics. We will reveal new data infiltrated by US social media channels in the Pew Internet and Global Network Index [4]. Since it is still in its early stages, many charts will use the latest data from 2018 until the new study is published in 2019.

## **3 Overall Popularity of Social Media Globally**

Every year, at the beginning of this year, We Are Social will update its vast collection of global statistics to provide very good information about the social media world. This is a good download demo [4]. It is particularly interesting to see how different countries are using social media, and it is surprising that Western countries are significantly behind adoption rates.

Highlights of the 2019 Global Digital Report [5] include:

- In 2019, the number of Internet users worldwide was 4.388 billion euros, an increase of 9.1% year-on-year.
- In 2019, the total number of global social media users was \$3.444 billion, an increase of 9% over the previous year.
- In 2019, the number of mobile phone users was 5.112 billion, an increase of 2% over the previous year.
- Annual growth continues to grow steadily, especially among active users of mobile social networks: 42% penetration rate is 3% higher than 2018.

The web traffic share of each device strongly supports 52% of mobile devices (stable year-on-year), while Desktop is still ranked second, with only 43% of devices sharing on all web pages, as shown in Figure 1 [6].

North America, West and South America, and North America have the highest Internet penetration rates, with Internet users accounting for between 88% and 95% of the

total population. Among them, Southern Europe's Internet penetration rate increased the most, up 11% year-on-year, as shown in Figure 2.



Fig. 1. Annual growth continues apace.

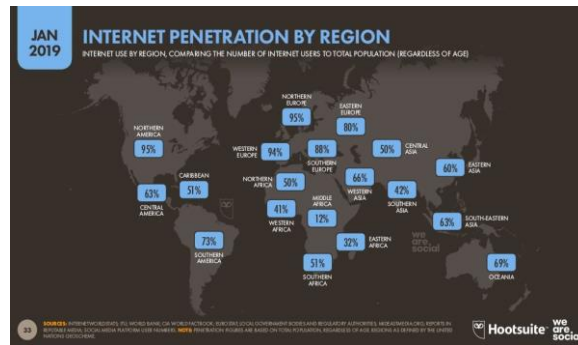


Fig. 2. The largest internet penetration.

Since January 2018, the overall growth rate of social media usage has been 9%. Saudi Arabia's social media penetration rate was the highest in 2019, at 99%, well above the world average of 45%. Taiwan, South Korea and Singapore are among the most important countries for social media penetration today. But Kenya, Nigeria and Ghana have the lowest penetration rates for social media.

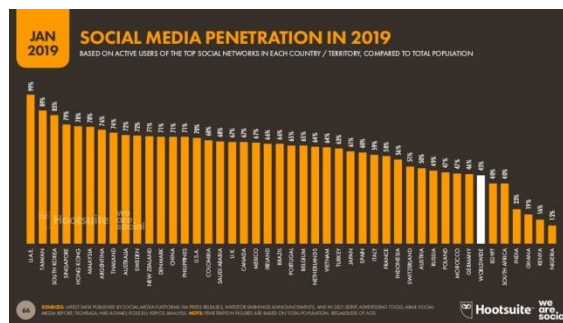


Fig. 3. Social Media Usage Since January 2018.

## 4 Benchmarks for Social Networks (Facebook)

On social networks, there are active users every day. But we're only going to look at Facebook's most active daily users compared to other social networks, and it's important to understand how your content works and what features are used to optimize the content. Compared with the page, the average diffusion rate after diffusion is 8% (a decrease of 2.7% in one year) and 27.1% after the diffusion. Although recent algorithm updates have seen a reduction in organic opportunities, Facebook today is an influent social platform for organic and paid opportunities with huge potential impact. More important than ever is to target Facebook content to corporate characters to get high quality leads.



Fig. 4. Page Reach Benchmarks.

Full analyzed report is a large amount of data that socializes with more than 200 slides. It provides country-specific data for most countries in the world. As a result, you can view national slides in key markets to better understand the company's current situation in the region where you operate.

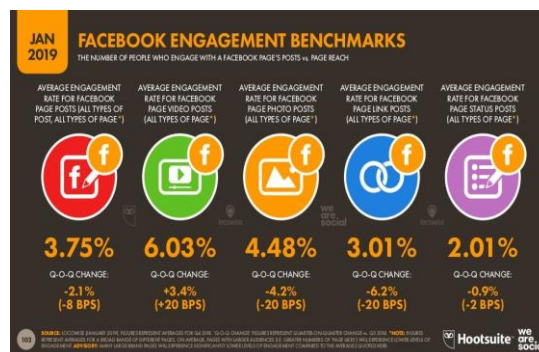


Fig. 5. Engagement Benchmarks.

## 5 Most Popular and Actual Social Networks

The latest comScore panel analysis in the 2018 edition of "Global Digital Future Focus" compares the popularity of social networks over time. These data are based on their original panels in the US, Canada and France, Spain, Italy, Germany, the U.K. and Argentina, India, Brazil, Indonesia, Mexico, Malaysia. We have more details about the UK and also the US – it will be presented later in this paper.

We can see it is Facebook's blue ocean. This shows that despite Facebook's negative hype, Facebook will still be the main audience channel for a period of time.

In the UK, we can see that Instagram accounts for about 10% of social media minutes. If you are not using the latest technology and Instagram, we recommend that you consult them. For more details, check out our list of digital media.

Active users prepared by Statista (October 2018) through the Global Network Index panel data, this compilation of the world's most popular social networks provides active users (millions) with the number of clear images of Facebook. This will not be shocking to anyone! It has more than 2 billion active users and accounts for most of the market. Google's YouTube ranks second, followed by Facebook, Messenger and WhatsApp. Facebook's Instagram platform accounts for less than half of Facebook's traffic [4].

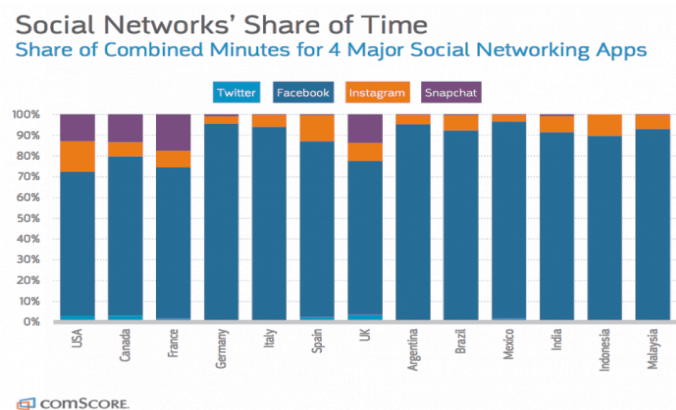


Fig. 6. Most Actual Social Networks Based on Share of Minutes.

Subsequently, we focused on the APAC, WeChat, QQ and Qzone platforms, with more than 600 million active users, highlighting APAC's extensive social networking products. Then, we can see a group of mainly Western social media networks in Tumblr, Instagram and Twitter.

Besides, Social Networks and Services can be used as channel for destructive manipulation information and psychological influence and this issue was detail researched by groups of scientists [9-12].

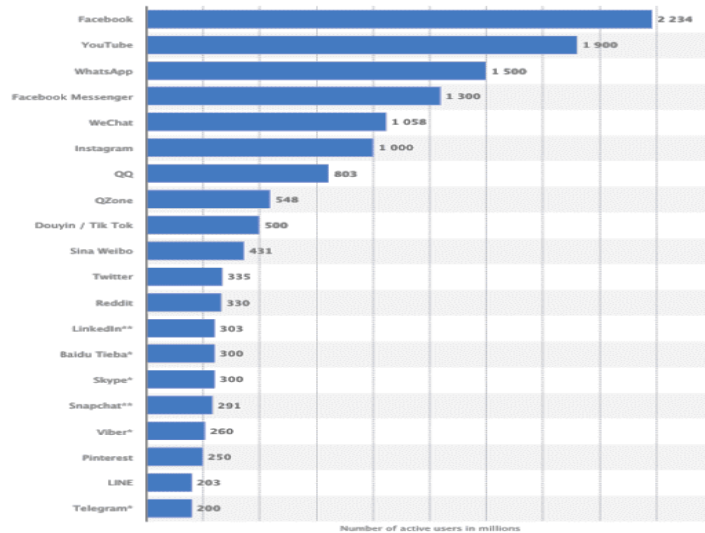


Fig. 7. Number of Active Users in millions.

## 6 Different ages Interests of Social Networks

The new 2019 report on children and parents: the use and attitude of the media published by Ofcom (UK), if your company is involved in the marketing of the children's or teen market or you want to understand its purpose; this is very interesting for the future of adult social media. It highlights the continued decline in Facebook usage among young people aged 12-15. His Facebook profile has grown from 40% in 2017 to 31% in 2018. During the same period, Instagram's growth rate increased from 14% to 23%, and the deadline for Snapchat was set 31% [13-16].

The following is an overview of two of the four age groups shown in Figure 8.

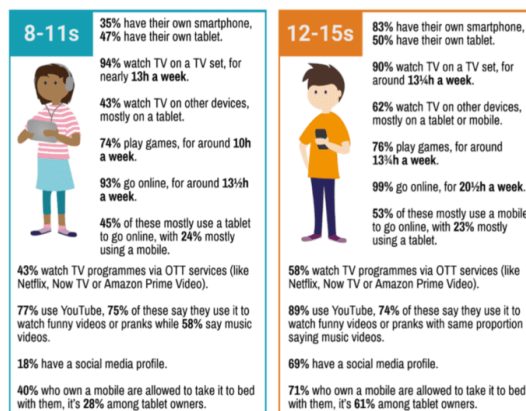
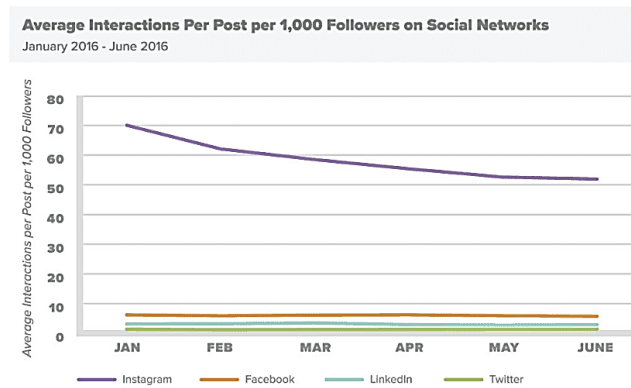


Fig. 8. Social Network Popularity.

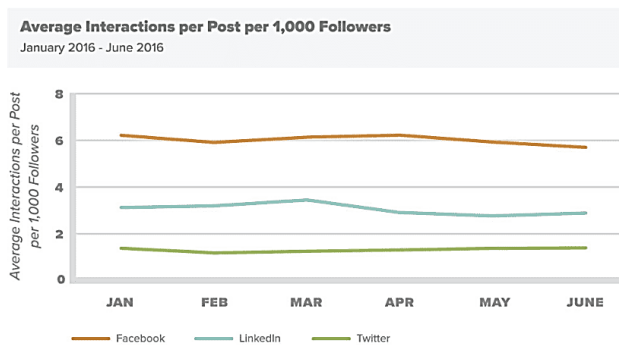
## 7 Different Interaction Rates in Social Media

Track Maven analyzes 51 million publications from 40,000 different companies in more than 130 industries to determine which social networks have the highest participation for each fan. The results show that Instagram absolutely dominates the interaction of 1,000 subscribers. In fact, it is much higher than the other channels we have to include in the second image to show the difference between social networks LinkedIn, Facebook and Twitter [17-19].

As we can see, Instagram is dominant but for other networks, Facebook has a significant lead in comparison with Twitter and LinkedIn. This is mainly because Internet users tend to post more on Twitter because it does not have an algorithm that only provides publications to a small audience. This turns Twitter into a piece of content that encourages companies to increasingly share what they hear through noise. This has the effect of reducing the shift commitment, as shown in Figures 9 and 10 [20].



**Fig. 9.** Per Post Followers.



**Fig. 10.** Per Post Followers.

## A. Popularity of Social Network in Different Countries

This is an excellent visualization of the social networks popularity based on interviews in the GWI report. If you choose your own country, you may be far behind the most popular countries in the four major social networks. Indonesia, the Philippines, Mexico, India and Brazil rank among the top 10, and their utilization rate is much higher than that of the U.S., the U.K. and EU.

Chart 9: VISITORS TO THE TOP SOCIAL PLATFORMS BY COUNTRY

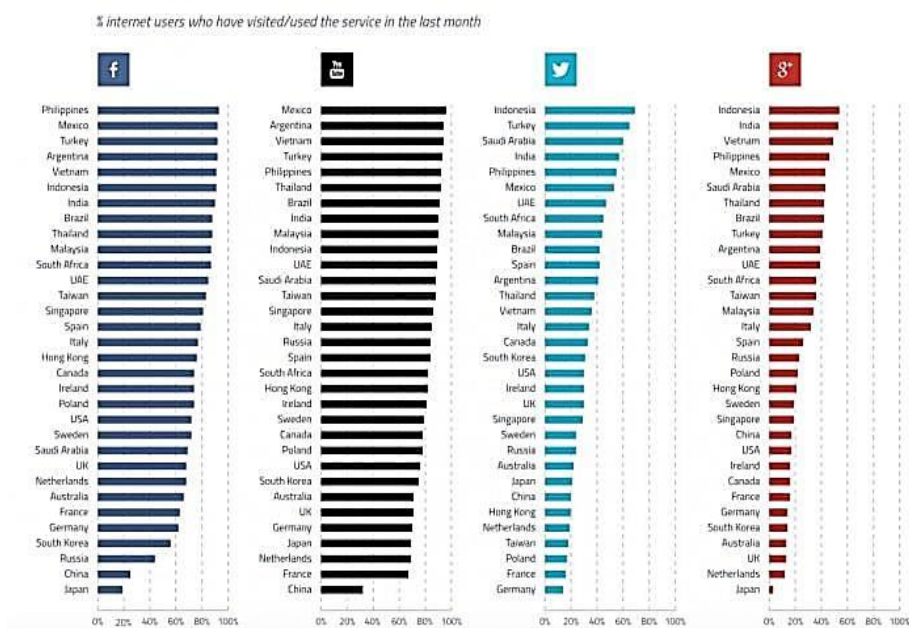


Fig. 11. Visitors to The Top Social Platforms Per Country.

## Conclusions

In this paper deep analysis of social networks and services exploitation was carried out. The Internet is a global public network where different intruders can access for example cloud services without any permission. In practice cloud computing users rely on third parties, which another major security issue (it's one of biggest today's security challenge) [7,12] in the cloud is computing [8]. This issue and generalized ontology show that social networks are now mature and can cover all ages and gender groups. The exceptions to this rule are Instagram and Tumblr, which are clearly popular among young people. Also it was highlighted about possibility of using social networks for destructive manipulative influence realization directed on person or social groups in cyberspace.



## References

1. Garton, L., Caroline, H. and Barry, W.: Studying online social networks. In *Journal of computer-mediated communication* 3, no. 1: JCMC313 (1997).
2. Aggarwal, Charu C.: An introduction to social network data analytics. In *Social network data analytics*, pp. 1-15. Springer, Boston, MA (2011).
3. Zaliskyi, M., Odarchenko, R., Gnatyuk, S., Petrova, Yu., Chaplits, A.: Method of traffic monitoring for DDoS attacks detection in e-health systems and networks. *CEUR Workshop Proceedings*, vol. 2255, pp. 193-204 (2018).
4. Chaffey, D. *Global social media research summary 2016. Smart Insights: Social Media Marketing* (2016).
5. Zywica, J. and Danowski, J. The faces of Facebookers: Investigating social enhancement and social compensation hypotheses; predicting Facebook™ and offline popularity from sociability and self-esteem, and mapping the meanings of popularity with semantic networks. *Journal of Computer-Mediated Communication* 14, no. 1: pp. 1-34 (2008).
6. Vértes, P.E. and Bullmore, E.T.: Annual research review: growth connectomics—the organization and reorganization of brain networks during normal and abnormal development. *Journal of Child Psychology and Psychiatry* 56, no. 3: pp.299-320(2015).
7. Gnatyuk, S., Sydorenko, V., Aleksander, M.: Unified data model for defining state critical information infrastructure in civil aviation, In *Proceedings of the 2018 IEEE 9th International Conference on Dependable Systems, Services and Technologies*, Kyiv, Ukraine, May 24-27, pp. 37-42 (2018).
8. Peleschyshyn, A., Holub, Z., Holub, I.:The preliminary stage of the algorithm for detecting information and psychological manipulation in online communities. In *2018 IEEE Proceedings of 13th International Scientific and Technical Conference on Computer Sciences and Information Technologies*, pp. 24-32 (2018).
9. Gnatyuk, S., Kinzeryavyy, V., Sapozhnik, T., Sopilko, I., Seilova, N., Hrytsak, A.: Modern Method and Software Tool for Guaranteed Data Deletion in Advanced Big Data Systems, *Advances in Intelligent Systems and Computing*, Vol. 902, pp. 581-590 (2019).
10. Tikhomirov, A., Kinash, N., Gnatyuk, S., Trufanov, A. et al: *Network Society: Aggregate Topological Models*, Communications in Computer and Information Science. Verlag: Springer International Publ, vol. 487, pp. 415-421 (2014).
11. Trach, O., Peleshchyshyn, A.: Development of directions tasks indicators of virtual community life cycle organization. In *Proceedings of 2017 12th International Scientific and Technical Conference on Computer Sciences and Information Technologies* (2017).
12. Gnatyuk, S., Akhmetova, J., Sydorenko, V., Polishchuk, Yu., Petryk, V.: Quantitative Evaluation Method for Mass Media Manipulative Influence on Public Opinion, *Proceedings of International Conference Computational Linguistics and Intelligent Systems (COLINS 2019)*, pp. 71-83 (2019).
13. Shakhovska, N., Holoshchuk, R., Fedushko, S., Kosar, O., Danel, R., Repka, M.: The sequential associative rules analysis of patient's physical characteristics. In: *CEUR Workshop Proceedings of the 1st International workshop on informatics & Data-driven medicine, IDDM 2018*, vol. 2255, pp. 82–92. Lviv, Ukraine (2018).
14. Trach, O., Vus, V., Tymovchak-Maksymets, O.: Typical algorithm of stage completion when creating a virtual community of a HEI. In: *13th International Conference “Modern Problems of Radio Engineering, Telecommunications and Computer Science”*, TCSET 2016, pp. 849–851. Lviv-Slavske, Ukraine (2016).
15. Trach, O., Peleshchyshyn, A.: Development of directions tasks indicators of virtual community life cycle organization. In: *12th International Scientific and Technical*

- Conference on Computer Sciences and Information Technologies, CSIT 2017, pp. 127–130. Lviv (2017).
16. Fedushko, S., Ustyianovych, T.: Predicting Pupil's Successfulness Factors Using Machine Learning Algorithms and Mathematical Modelling Methods. In: Hu, Z., Petoukhov, S., He, M. (eds.) *Advances in Intelligent Systems and Computing series, ICCSEEA 2019*, vol. 938, pp. 1–12 (2020). Springer, Cham (2020). DOI: 10.1007/978-3-030-16621-2\_58.
  17. Shakhovska, N., Holoshchuk, R., Fedushko, S., Kosar, O., Danel, R., Repka, M.: The sequential associative rules analysis of patient's physical characteristics In: *CEUR Workshop Proceedings of the 1st International Workshop on Informatics & Data-Driven Medicine, IDDM 2018*, pp. 82–92. Lviv, Ukraine (2018).
  18. Fedushko, S., Syerov, Yu., Korzh, R.: Validation of the user accounts personal data of online academic community. In: 13th International Conference “Modern Problems of Radio Engineering, Telecommunications and Computer Science”, TCSET 2016, pp. 863–866. Lviv-Slavske (2016). DOI: 10.1109/TCSET.2016.7452207.
  19. Mastykash, O., Peleshchyshyn, A., Fedushko, S., Trach, O., Syerov, Y.: Internet social environmental platforms data representation. In: 13th International Scientific and Technical Conference on Computer Sciences and Information Technologies, CSIT 2018, pp. 199–202. Lviv, Ukraine (2018).
  20. Fedushko, S., Shakhovska, N., Syerov, Y.: Verifying the Medical Specialty from User Profile of Online Community for Health-Related Advices. In: *CEUR Workshop Proceedings of the 1st International Workshop on Informatics & Data-Driven Medicine, IDDM 2018*, pp. 301–310. Lviv, Ukraine (2018). DOI: 10.1109/STC-CSIT.2018.8526586.