

Social Media Algorithms

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Abstract

The need and desire to communicate information, ideas, and emotions has been strong in humans. It has evolved from traditional forms such as story-telling, plays, paintings, carvings, community gatherings to digital forms of communication. As digital social media platforms are growing at a rapid pace and are touching billions of people worldwide, it becomes important to understand how these platforms work and their effect on users and the society. The present paper analyzes social media algorithms, how they rank content, and how Machine Learning drives these algorithms. The shortcomings of social media algorithms and their future are also discussed.

Keywords : Machine Learning, ranking signal, social media

I. INTRODUCTION

Humans are social beings and they have an impulse to communicate. The pre-internet roots of social media were established in 1844 with a telegraph machine on which a series of electronic dots and dashes were tapped out by hand [1].

The term *Social media* refers to technologies that enable users to share information, ideas etc. using virtual communities and networks. In 2021 there were more than 4.26 billion users of social media worldwide, and the number is likely to increase to 6 billion in 2027 [2].

Users find social media useful for entertainment, learning, brand building, and for discussions on various topics. Social media mostly depends upon users to generate content such as digital messages, pictures, podcasts, and videos. Users access social media through web browsers or mobile apps. Companies also use social media for advertising. Some popular social media platforms are Facebook, Instagram, Youtube, Twitter, LinkedIn etc. As content is the lifeline of social media, it is important for social media to provide relevant content to their users [3]. Therefore, it becomes vital for these platforms to understand the preferences of individuals and serve them content accordingly. Most social media

algorithms sort posts in a user's timeline or feed based on relevance instead of showing them chronologically.

II. SOCIAL MEDIA ALGORITHMS

The algorithm of every social media platform is different, but they are all based on machine learning and a set of factors called ranking signals [4]. Facebook and Twitter show posts from your circle, that is your family and friends top and center in your feed as you interact with these accounts the most. However, the algorithms are not fixed and keep changing. This is challenging for marketers who have to adapt their strategies accordingly to target their prospects and customers.

Users are likely to see content from people they follow, have conversations with or engage with. Instagram also shows content on the basis of interest of the user, trending topic and timeline. Frequency of interaction and likes are signals of popularity. For example, Instagram is focusing on engagement level of stories and short videos called Reels [5]. The feed on Facebook is mostly filled with content from people and pages a user follows. Again posts with lot of interaction are given higher ranking.

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TABLE I.
RANKING SIGNALS OF SOCIAL MEDIA PLATFORMS [6]

Social Media Platform	Content and purpose	Ranking Signals
Facebook	Facebook is used by people to connect with family, friends, people with similar interests or icons in various fields such as movies, dance etc. It is used for getting information and entertainment. It has posts and videos.	Interactivity
		Interest
		Impressions
Youtube	Youtube hosts video content that is used for entertainment, education, and getting information on various topics.	Click through rate
		Average view duration
		Average percentage viewed
		Likes and dislikes
		Viewer surveys
		Watch history
		Channels subscribed
		Personalization
		Search query
Instagram	The main content on Instagram revolves around posts, stories and reels which entertain, provide information, or motivate people.	Interactivity
		Interest
		Information
Pinterest	Pinterest is largely used by people who are Interested in home décor, aesthetics, food, and style	High quality images
		Visually appealing designs
Twitter	Twitter is mainly used b people to share views and information.	Engagement
		Hashtags
		Mentions
		Retweets
LinkedIn	LinkedIn is mainly used by professionals, academicians and companies to connect with each other.	Spam
		Low-quality posts
		High quality content

Terms associated with ranking are:

(1) Information : This shows the value of content posted. If people talk about it, engage with it, like it, and share it, it means that the content is valuable.

(2) Impressions : The number of views a piece of content gets.

(3) Personalization : Personalized content is based on user's watch history, people or groups followed, or to channels subscribed.

(4) Interactivity : It is the number of times content is commented on, liked, and shared.

(5) Click Through Rate (CTR) : Number of clicks received divided by number of views.

Some ranking signals of various social media platforms are listed in Table I.

III. MACHINE LEARNING

Machine Learning algorithms are used by social media platforms in various ways. Some of these are :

(a) Machine Learning algorithms are used by social media platforms to recognize images. As users prefer videos and pictures to text, marketers use these to engage their target audience [7].

(b) It is important to keep social media spam free to keep it valuable for its users. As social media content spreads like wild-fire, it becomes necessary to keep filtering it and keep it spam free.

(c) Machine Learning algorithms along with human intervention are required to identify and stop the spread of fake news [7].

(d) Social media platforms use AI for market segmentation. Digital marketing is a fast growing career opportunity. Marketers can target specific customers through sponsored advertisements and posts that can directly hit the target [7].

(e) Machine Learning generates powerful insights by analyzing humungous data which helps marketers craft their online and offline strategies [7].

(f) Social media suggests people and groups that a person may be interested in connecting with on the basis of his profile, preferences, and activity. This is done on the basis of Machine Learning and Natural Language Processing.

(g) Machine Learning finds the right target audience on social media platforms for pushing paid promotions that are paid by advertisers [7].

IV. COMMERCIAL USE

Many users create a personal brand on social media by creating and posting content on various topics such as beauty, health, motivation. Since user created quality content is at the core of social media platforms to succeed, users who create quality content, have a large following are rewarded monetarily by these platforms on the basis of these criteria. Some content topics such as finance, sports, beauty and health, and motivation are more financially rewarding than others. The influencers earn not only from the platform but also from advertisers who pay them to promote their products and services. Many people are using social media as a regular source of earning.

V. POPULARITY BIAS

Almost all web technology platforms have a popularity bias. Popularity bias can lead to harmful unintended consequences. Social media platforms such as Twitter, Facebook, Instagram, and Youtube use Artificial Intelligence algorithms to rank and recommend content. So, content with higher engagement ranks higher. Popularity bias can lower the quality also by promoting low quality content if has high engagement which can be manipulated. People aiming to manipulate information

create fake accounts, trolls, and bots. This can be used even to manipulate elections in countries, and tarnish reputation of candidates [8].

Social media platforms such as Twitter and Facebook have faced flak because of their selectivity in hiding posts of ideologies that the company is against and shadow banning users for dubious reasons [9]. This is often because of human bias and human intervention.

A. Handling Bias

High frequency behaviors such as automated liking and sharing could be inhibited by tests like CAPTCHA. This will reduce noise from fake accounts and people will be able to spend more time reading and understanding posts before sharing them or engaging with them with others [5]. This will reduce unwanted noise on social media.

B. Role of the Government

Governments can force social media platforms to abide my regulations of their countries to tackle the menace of manipulation of views and stopping spread of misinformation that disturbs law and order and poses a risk to the privacy and security of individuals. For example, the Indian government had made Twitter answerable by passing a legislation that required it to have an office in India and made its employees in India answerable. Social media platforms that indulge actively in promoting and manipulating news and views would not be considered as an intermediary that is not responsible for the content it hosts.

Amendments being brought to India's 2021 IT laws mandate government scrutiny of social media players over hosting illegal and inflammatory content under which social media companies can lose their immunity or protection against third-party content violations [10]. With these amendments, governments and courts can also overturn decisions of these platforms to block, suspend, and remove accounts of various users over various violations. The Indian government had to bring in these amendments as social media giants with political, ideological, or cultural bias have refused to take down such content or have promoted content that is very biased in the past.

VI. CONCLUSION

The use of social media is widespread today. Social media technologies are connecting people like never before. Technologies like Machine Learning and Artificial Intelligence are making social media platforms relevant and useful for their users for entertainment, knowledge sharing, career, and business interests. However, there are some issues like spamming, unethical and fake news which cannot be completely detected and weeded out by Machine Learning algorithms. Some human intervention is required here. This is also the reason governments of various countries have stepped in to protect user privacy and to prevent suppression and obfuscation of facts and diverse views. In the future, immersive experience, augmented reality, and will gain momentum on social media for entertainment, e-commerce, and it will these will pose new challenges of weeding out unhealthy content for social media algorithms. Nevertheless, influence of social media will grow stronger in these areas with these technologies.

AUTHOR'S CONTRIBUTION

Deepak Jain is the sole author of the present paper. He has performed the entirety of the work described in this paper.

CONFLICT OF INTEREST

The author certifies that he has no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in the manuscript.

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Deepak Jain is an experienced engineer and product leader with a demonstrated history of working in the computer software industry solving technically challenging problems at scale. Eager to build products, solving real-time problems, Deepak founded Subtlelabs as a product engineering company that is today serving customers across the globe. He had earlier worked with global companies and architected solutions in Healthcare, Security, Fintech, Logistics and CRM domains.