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Question bank
Module 1

1. Why it is important for business managers to understand and mine social media data?
Ans.
Today, social media has evolved into a powerful tool to help you reach your target audience and grow your small business. For this reason, if you want to take this seriously, you need to make decisions based on the data that social media analytics provides small businesses rather than a gut feeling.

Fortunately, most social media platforms offer analytics and reports on how your content is doing and how the audience is receiving it. But, the question is, are you using this information to your advantage?

Here are five ways you can use social media analytics for your business plan that you can start implementing today!

(1) Customer insights

- Social media is not only about getting likes, people commenting on what you post and share. The key to real success lies in looking at the right metrics and uncovering opportunities.
- Insights can tell you more about your audience's interests, demographics, connections, and behavior with your content. With this information in hand, you can segment your audience and create marketing personas.
- You can also understand better what your audience is looking for, what their needs and wants are, and how you can satisfy them with your products or services.

(2) What are your top-performing channels ?

- Not every social media platform works great for every brand. What can work well for one company may not work for yours. The good news is that there are many social media channels to choose from: Twitter, Facebook, Instagram, TikTok, and more.
- Many people often ask themselves if they should be on every channel. Still, even if you have the opportunity to do so, it may not be the best idea.
- Work on finding the best channel combination for your small business. Focus on where your audience is and choose channels to produce great content and engage with potential customers.
- The best way to know this is, of course, by looking at the social media analytics of each channel you are using and deciding to keep only those who are performing well.

(3) Create relevant content

- Today, high-quality content creation is crucial for any strategy in social media. Your audience needs to find it exciting and entertaining. One way to know your brand's best content is by looking into social media analytics.
- This way, you can develop a more ingenious content strategy, focused and targeted to your audience.
- You can analyze what content your audience engages with the most and the topics they respond well to are. Then, you can optimize your social media marketing plan and create content that resonates with your followers.

2. What is social media analytics, and how it is different from traditional business analytics?

Ans.
The differences aren't just interesting, understanding how social media is different from traditional media has a major impact on whether you're successful with social media. Run a social media campaign like your traditional media campaign and you are likely to see more damage to your brand reputation than benefit and you'll waste a lot of money doing it.

Table 1.7.1 : Differences Between Social Media and Traditional Media

Sr. No.	Social Media	Traditional Media
1.	Two-way conversation	One-way conversation
2.	Open system	Closed system
3.	Transparent	Opaque
4.	One-on-one marketing	Mass marketing
5.	About you	About ME
6.	Brand and User-generated Content	Professional content
7.	Authentic content	Polished content
8.	FREE platform	Paid platform
9.	Metric: Engagement	Metric: Reach/ frequency
10.	Actors: Users/ Influencers	Actors/ Celebrities
11.	Community decision-making	Economic decision-making
12.	Unstructured communication	Controlled communication
13.	Real time creation	Pre-produced/ scheduled
14.	Bottom-up strategy	Top-down strategy
15.	Informal language	Formal language
16.	Active involvement	Passive involvement

3. Briefly explain the seven layers of social media data. Support your answer with examples.

Ans.

Social media at a minimum has seven layers of data. Each layer carries potentially valuable information and insights that can be harvested for business intelligence purposes. Out of the seven layers, some are visible or easily identifiable (e.g., text and actions) and other are invisible (e.g., social media and hyperlink networks).

(1) Layer One: Text

Social media text analytics deals with the extraction and analysis of business insights from textual of social media content, such as comments, tweets, blog posts, and Facebook status updates.

Text analytics is mostly used to understand social media users' sentiments or identify emerging themes and topics.

(2) Layer Two: Networks

Social media network analytics extract, analyze, and interpret personal and professional social networks, for example, Facebook, Friendship Network, and Twitter.

Network analytics seeks to identify influential nodes (e.g., people and organizations) and their position in the network.

(3) Layer Three: Actions

Social media actions analytics deals with extracting, analyzing, and interpreting the actions performed by social media users, including likes, dislikes, shares, mentions, and endorsement.

Actions analytics are mostly used to measure popularity, influence, and prediction in social media.

(4) Layer Four: Mobile

Mobile analytics is the next frontier in the social business landscape. Mobile analytics deals with measuring and optimizing user engagement with mobile applications.

(5) Layer Five: Hyperlinks

Hyperlink analytics is about extracting, analyzing, and interpreting social media hyperlinks (e.g., in-links and out-links).

Hyperlink analysis for example, Internet traffic patterns and sources of incoming or outgoing traffic and from a source.

(6) Layer Six: Location

Location analytics, also known as spatial analysis or geospatial analytics, is concerned with mining and mapping the locations of social media users, contents, and data.

(7) Layer Seven: Search Engines

Search engines analytics focuses on analyzing historical search data for gaining a valuable insight into a range of areas, including trends analysis, keyword monitoring, search result and advertisement history, and advertisement spending statistics.

4. Explain the social media analytics cycle.

Ans.

Social media analytics is a six step iterative process (involving both the science and art) of mining the desired business insights from social media data. At the center of the analytics are the desired business objectives that will inform each step of the social media analytics journal.

goals are defined at the initial stage, and the analytics process will continue until the stated business objectives are fully satisfied. To arrive from data to insights, the steps may vary greatly based on the layers of social media mined (and the type of the tool employed).

The following are the six general steps, at the highest level of abstraction, that involve both the science and art of achieving business insights from social media data.

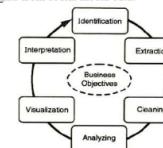


Fig. 1.10.1 : Social media analytics Cycle

Step 1: Identification

- The identification stage is the art part of social media analytics and is concerned with searching and identifying the right source of information for analytical purposes.
- Thus, framing the right question and knowing what data to analyze is extremely crucial in gaining useful business insights. The source and type of data to be analyzed should be aligned with business objectives. Most of the data for analytics will come from your business-owned social media

Step 2: Extraction

Once a reliable and nimble source of data is identified, next comes the science of extraction stage.

- The type (e.g., text, numerical, or network) and size of data will determine the method and tools suitable for extraction. Small-size numerical information, for example, can be extracted manually (e.g., going through your Facebook fan page and counting likes and copying comments), and a large-scale automated extraction is done through an API (application programming interface). Manual data extraction maybe practical for small-scale data, but it is the API-based extraction tools that will help you get most out of your social media platforms. Mostly, the social media analytics tools use API-based data extraction. APIs, in simple words, are sets of routines/protocols that social media service companies (e.g., Twitter and Facebook) have set up that allow users to access small portions of data hosted in their databases.

Step 3: Cleaning

- This step involves removing the unwanted data from the automatically extracted data. Some data may need a lot of cleaning, and others can go to analysis directly.
- In the case of the text analytics, for example, cleaning, coding, clustering, and filtering may be needed to get rid of irrelevant textual data using natural language processing (NLP).
- Coding and filtering can be performed by machines (i.e., automated) or can be performed manually by humans. For example, Discover Text combines both machine learning and human coding techniques to code, cluster, and classify social media data.

Step 4: Analyzing

- At this stage the clean data is analyzed for business insights. Depending on the layer of social media analytics under consideration and the tools and algorithm employed, the steps and approach you take will greatly vary. For example, nodes in a social media network can be clustered and visualized in a variety of ways depending on the algorithm employed.
- The overall objective at this stage is to extract meaningful insights without the data losing its

integrity. While most of the analytics tools will follow you through the step- by-step procedure to analyze our data, having background knowledge and an understanding of the tools and its capabilities is crucial in arriving at the right answers.

Step 5: Visualization

- In addition to numerical results, most of the seven layers of social media analytics will also result in visual outcomes.
- It is the effective visualization of the results that will demonstrate the value of social media data to top management. Depending on the layer of the analytics, the analysis part will result in relevant visualizations for effective communication of results.
- Text analytics, for instance, can result in a word cooccurrence cloud; hyperlink analytics will provide visual hyperlink networks; and location analytics can produce interactive maps.

Step 6: Interpretation

This step relies on human judgments to interpret valuable knowledge from the visual data. Meaningful interpretation is particularly important when we are dealing with descriptive analytics that leave room for different interpretations. Having domain knowledge and expertise are crucial in consuming the obtained results correctly. Two strategies or approaches used here can be

- (1) producing easily consumable analytical results and
- (2) improving analytics consumption capabilities.

The first approach requires training data scientists and analysts to produce interactive and easy-to-use visual results. And the second strategy focuses on improving management analytics consumption capabilities.

5. What ethical issues should be considered when mining social media data?

Ans.

The process of data mining of social media and the use of its results and analytics possess various crucial legal and ethical issues around the areas of informed consent, anonymity, and profiling of individual users. Data mining of social media becomes sensitive when it is done on a population like migrants which already consider as vulnerable. Some of the legal and ethical issues are listed below-

- Informed consent- is an important legal and ethical issue with the mining of the data of social media users. Mining data on social media means that information is collected without directly informing the users which is illegal and unethical because data on social media platforms fully belong to the users.
- Anonymity- is one of the other ethical issues. Because users will be anonymous about that who will process their data and for what purposes. If mining is allowed then social media companies will sell the data of their users without their consent to anonymous analytic firms and users will lose their control and data privacy.
- Profiling- After mining, the analytics company will create the profile of the user community belonging to different regions and then sell the output of the mining to the election parties that may badly affect the result of the elections and through this way the trustworthiness and transparency of each official institution will be endangered.

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6. What are some main challenges to social media analytics?

Ans.

Social media data is high volume, high velocity, and highly diverse, which, in a sense, is a blessing in terms of the insights it carries; however, analyzing and interpreting it presents several challenges.

Analyzing unstructured data requires new metrics, tools, and capabilities, particularly for real-

more analytics than most businesses do not possess.

Volume And Velocity As A Challenge

- Social media data is large in size and is swiftly generated. Capturing and analyzing millions of records that appear every second is a real challenge. For example, on Twitter, three-hundred forty-two thousand tweets appear every minute, and on Facebook, one million likes are shared every twenty minutes.
- Capturing all this information may not be feasible. Knowing what to focus on is crucial for narrowing down the scope and size of the data. Luckily, sophisticated tools are being developed to handle high-volume and high-velocity data.

Diversity As Challenge

- Social media users and the content they generate are extremely diverse, multilingual, and vary across time and space. Not every tweet, like, or user is worth looking at. A tweet or mention coming from an influential social media user is more important than a tweet from a noninfluential user.
- Due to the noisy and diverse nature of social media data, separating important content from noise is challenging and time consuming.

Unstructuredness As A Challenge

- Unlike the data stored in the corporate databases, which are mostly numbers, social media data is highly unstructured and consists of text, graphics, actions, and relations.
- Short social media text, such as tweets and comments, has dubious grammatical structure, and is laden with abbreviations, acronyms, and emoticons(a symbol or combination of symbols used to convey emotional expressions in text messages), thus representing a great challenge for extracting business intelligence.

7. Compare different social media analytics tools available in the market and explain their strengths and weakness.

Ans.

Table 1.12.1 : Social media analytics tools

Layer of social media	Example of tools
Text	<ul style="list-style-type: none">• Discovertext• Lexalytics• Tweet Archivist• Twitonomy• Netlytic• LIWC• Voyant
Actions	<ul style="list-style-type: none">• Lithium• Twitonomy• Google Analytics• SocialMediaMineR
Networks	<ul style="list-style-type: none">• NodeXL• UCINET• Pajek• Netminer• Flocker• Netlytic• Reach Mentionmap
Mobile	<ul style="list-style-type: none">• Countly• Mixpanel• Google Mobile Analytics
Location	<ul style="list-style-type: none">• Google Fusion• Table Location• Google Fusion Table• Tweepsmap• Trendsmap• Followerwonk• Esri Maps• Ago
Hyperlinks	<ul style="list-style-type: none">• Webometrics Analyst• VOSON
Research Engines	<ul style="list-style-type: none">• Google Trends

Module 2

1. What is a network?

Ans.

At a very basic level, a network is a group of nodes that are connected with Nodes (also known as vertices) can represent anything, including individuals, organizations, countries, computers, websites, or any other entities. Links (also known as ties, edges, or arcs) represent the relationship among the nodes in a network. Networks can also exist among animals.

A social network is a group of nodes and links formed by social entities where nodes can represent social entities such as people and organizations. Links represent their relationships, such as friendship and trade relations. Social networks can exist both in the real and online worlds.

A network among classmates is an example of a real world social network. And a Twitter following network is an example of an online social media network. In a Twitter follow-following network, nodes are the Twitter users, and links among the nodes represents the follow-following relationship (i.e., who is following whom) among the users. The subject of this book is online social networks.

2. What is the purpose of network analytics?

Ans.

- Networks are the building blocks of social media and can carry useful business insights. Social media network analytics thus deals with constructing, analyzing, and understanding social media networks.
- Social network analytics can be used for a variety of purposes. It can be employed to identify influential nodes (e.g., people and organizations) or their in the network, or to understand the overall structure of a network.
- Overall, the purpose of network analysis is to:
 - Understand overall network structure, for example, number of nodes, number of links, density, clustering coefficient, and diameter.
 - Find influential nodes and their rankings; for example, degree, betweenness, and closeness centralities.
 - Find important links and their rankings; for example, weight, betweenness, and centrality.
 - Find cohesive subgroups; for example, pinpointing communities within a network
 - Investigate multiplexity; for example, analyzing comparisons between different link types, such as friends vs. Enemies

3. Briefly differentiate among social networks, social network sites, social networking, and social network analysis.

Ans.

A social network

- A social network is a group of nodes and links formed by social entities where nodes can represent social entities such as people and organizations. Links represent their relationships, such as friendship and trade relations. Social networks can exist both in the real and online worlds.
- A network among classmates is an example of a real world social network. And a Twitter following network is an example of an online social media network. In a Twitter follow-following network, nodes are the Twitter users, and links among the nodes represent the follow-following relationship (i.e., who is following whom) among the users. The subject of this book is online social networks.

A social network site

- A social network site is a special-purpose software (or social media tool) designed to facilitate the creation and maintenance of social relations.
- Facebook, Google+, and LinkedIn are examples of social network sites.

Social Networking

- The act of forming, expanding, and maintaining social relations is called social networking.
- Using social network sites, users can, for example, form, expand, and maintain online social ties with family, friends, colleagues, and sometimes strangers.

Social network analysis

- Social network analysis is the science of studying and understanding social networks and social networking.
- It is a well-established field with roots in a variety of disciplines including Graph Theory, Sociology, Information Science, and Communication Science.

4. Briefly explain the different types of social media networks.

Ans.

There are several types of social media networks; we will discuss a few of them. Social media network types are as follows

Friendship Networks:

- The most common type of social media networks are friendship networks, such as Facebook, Google+. Friendship networks let people maintain social ties and share content with people they are closely associated with, such as family and friends.
- Nodes in these networks are people, and links are social relationships (e.g., friendship, family, and activities).

Follow-Following Networks

- In the follow-following network, users follow (or keep track of) other users of interest. Twitter is a good example of follow-following network where users follow influential people, brands, and organizations.
- Nodes in these networks are, for example, people, brands, and organizations, and links represent following relations (e.g., who is following whom). Below are two common Twitter terminologies.
 - Following - Following are the people who you follow on Twitter.
 - Following someone on Twitter means:
 - You are subscribing to their tweets as a follower.
 - Their updates will appear in your Home tab.
 - That person is able to send you direct messages.
 - Followers - Followers are people who follow you on Twitter. If someone follows you, it means that
 - They will show up in your followers list.
 - They will see your tweets in their home timeline whenever they log in to Twitter.
 - You can send them direct messages.

Fan Network

- A fan network is formed by social media fans or someone or something, such as a product, service, brand, business, or other entity.
- The network formed by the social media users subscribed to your Facebook fan page is an example of a fan network.

Group Network

- Group networks are formed by people who share common interests and agendas. Most social media platforms allow the creation of groups where members can post, comment, and manage in-group activities.
- Examples of social media groups are Twitter professional groups, Yahoo Groups, and Facebook groups.

5. What is the difference between explicit and implicit networks?

Ans,

Based on the way the networks exist online or are constructed, they can be classified:

(1) Implicit networks or (2) Explicit networks

(1) **Implicit Networks**

- Implicit networks do not exist by default (or are hidden) and need to be intentionally constructed with the help of dedicated techniques.
- Examples of such networks include keyword co-occurrence networks, co-citation networks, hyperlink networks, etc.
- Constructing and studying implicit networks can provide valuable information and insights

(2) **Explicit Networks**

- Explicit social media networks exist by default; in other words, they are explicitly designed for social media users to part of
- Most social media networks are explicit in nature.
- Examples of explicit social media networks include Facebook friendship network, Twitter follow-following networks, LinkedIn professional networks, YouTube subscribers' network, and bloggers' networks.

6. What is the difference between one-mode, two-mode, and multimode networks?

Ans.

Based On Mode

Based on the composition of nodes, networks can be classified as .

(1) **One-Mode Networks**

- A one-mode network is formed among a single set of nodes of the same nature.
- A Facebook friendship network is an example of a one-mode network where nodes (people) form network ties (friendships).

(2) **Two-Mode Networks**

- Two-mode networks (also known as bipartite networks) are networks with two sets of nodes of different classes. In these networks, network ties exist only between nodes in different sets.
- For example, consider the network, where one set of (circles) could social media users and another set of nodes (squares) could participation in a series of events. Users are linked to the events they attended.

(3) **Multimode Network**

- A multimode network is also possible where multiple heterogeneous are connected together.
- It can be considered as an amalgam of one and two-mode networks.

7. Differentiate between weighted and unweighted networks.

Ans.

Based on Weights

Networks can also classified based on the weight assigned to the links among the nodes. Mainly there are two types of weighted networks

(1) **Weighted Networks**

- In weighted networks, the links among nodes certain weights to indicate the strength of association among the nodes.
- The link (relationship) between, for example, two friends (nodes) will thicker if they communicate more frequently. Weighted networks can provide rich information, but are difficult to construct.

(2) **Unweighted Networks**

- In unweighted networks, links among nodes do not weights.
- The links only indicate the existence of a relationship and cannot provide clues about the strength of the relationship. Unweighted networks are easy to construct, but may conceal useful information.

8. Briefly define important node level properties, such as degree, betweenness, eigenvector centralities, and structural holes.

Ans:

Node-Level Properties

Node-level properties focus on one node and its position in the network. Some important node properties include degree centrality, centrality, eigenvector centrality, and structural holes.

- **Degree Centrality**

Degree centrality of a node in a network measures the number of links a node has to other nodes.

- **Betweenness Centrality**

Betweenness centrality is related to the centrality (or position) of a node in a network.

- **Eigenvector Centrality**

Eigenvector centrality measures the importance of a node based on its connections with other important nodes in a network.

- **Structural Holes**

- In a social media network, some users, because of their network position, may have an advantage or disadvantage in terms of opportunities to form and propagate information.

- New ideas and information mostly come from structure holes (or weak ties) that in a network. A user with more weak ties can receive novel ideas and information from remote network clusters.

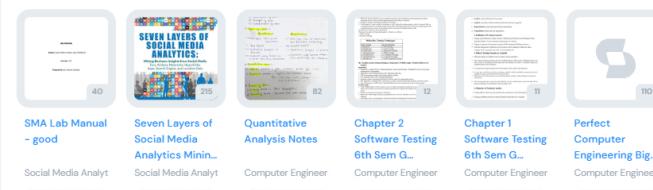
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