Section 1: Preamble

1. How is big data being used in this business sector?

With big data, social media is a must-use platform for companies if they are to achieve success in the digital age. Social media data is a prime source of information that a business can use to gain market penetration, consumer and brand engagement and other marketing strategies and business investment metrics. For example, if a business is looking to venture into a new product, big data and social media can help them know how much they should expect to sell. On top of this, they can engage customers to enhance brand awareness.

Social Media Analytics and Volume:
Social Media has many factors that contribute to the increase of data volume to explore. There are unstructured data streaming as well as increase of sensor and machine to machine data being collected. Proper use of Social Media Analytics can help create value which is significant to the relevant data.

Social Media Analytics and Velocity:
Data in Social Media is streaming at exceptional speed that must be dealt with in a well- timed manner. It would be interesting to explore this feature in Social Media analytics as this is one of the great challenges for many organizations.

Social Media Analytics and Variety:
Data in Social Media come in all types of formats. Structured numeric data in traditional databases, information generated from line-of-business applications, unstructured text documents, email, video, audio, stock ticker data and financial transactions all comes in different types of formats.

Social Media Analytics and Variability:
Social Media data flows can be highly unpredictable with periodic peaks. Such data loads from what's trending in social media, mixed up with unstructured data are even more challenging to manage yet interesting to explore.

Social Media Analytics and Complexity:
Data in Social Media comes from numerous sources. It is a great challenge to undergo the different processes like linking, matching, connecting, correlating relationships, hierarchies and multiple data linkages. This is how complex data can be and if not managed properly, they can spiral out of control.
Social media websites account for the creation of large amounts of big data and are at the same time one of the biggest consumers of it. Social media sites are using big data to get insights into their users. With the information, they can deliver customized news feeds that interest their users. The more users use social media; the bigger data is refined. It can the be used for target marketing. A good example is Facebook; when browsing, a user will only be shown news feeds and marketed product that they are likely to read or buy.

Redefined social media marketing:
Big data has revolutionized social media marketing. It has enabled consumers to be targeted more efficiently. Social media is turning out to be one of the most effective marketing

platforms because of big data. Customer relationship management software and marketing automation are used to gather social media data, filter, analyze and be used almost immediately to reach customers who are most likely to be converted. For example, a company can track consumers and analyze their behaviors, from liking a brand on Facebook, adverts they watch on TV and YouTube, and what brands they read.

Level playing field for businesses:
Big data has made social media a level playing field. Anyone with the right skills can use the information to promote their business. A small business does not need a lot of investment to do marketing. With a small budget, they can reach just the number of customers that they require. For example, a business selling dresses can spend 20 dollars on Facebook adverts and reach a potential 10,000 customers with about 500 conversions. This is thanks to big data that is available on Facebook that targets the adverts to the right audience.

Real-time feedback:
Big data is generated every minute, and immediate feedback is possible to obtain. Consumers can be gauged to measure their interest before launching a product. One can place an advert on social media and track the response within a few minutes. If a company is planning to launch a product in a new country, they can initiate a campaign to potential customers based on big data information and analyze the response.

The data on social interactions is an increasingly attractive set of information, particularly for marketing, sales and support functions. It's often in unstructured or semi structured forms, so it poses a unique challenge when it comes to consumption and analysis. Furthermore, social media analytics tools mean that businesses can look beyond the chatter contained in unstructured data to find meaningful information that can guide decisions and action. Through analysis of statistical data such as impressions per post, audience distribution, interactions on mobile versus desktop, responses (e.g., retweets), click-through rates for URLs embeds, and transactional history, a company can measure the effectiveness of its social media strategy for promoting brand recognition and loyalty.

2. What are the major challenges to its adoption and continued propagation throughout the industry?

The Social Media analytics is collecting information or data from the social media websites, blogs etc. and uses it in business purpose or decision making. Now a Days Social Media is the best platform for understand the real-time customer choice or intentions and sentiments, using social media business advertising, product marketing easily. EBay.com uses two data warehouses at 7.5 petabytes and 40PB as well as a 40PB Hadoop cluster for search, consumer recommendations, and merchandising. Inside eBay's 90PB data warehouse. Amazon.com handles millions of back-end operations every day, as well as queries from more than half a million third-party sellers. The core technology that keeps Amazon running is Linux-based and as of 2005 they had the world's three largest Linux databases, with capacities of 7.8 TB, 18.5 TB, and 24.7 TB. Facebook handles 50 billion photos from its user base. As of August 2012, Google was handling roughly 100 billion searches per month.

Challenges of social media analytics:
a) Massive amounts of data require lots of storage space and processing power.
b) Shifting social media platforms.
c) Evolution of online language

d) One of the biggest challenge with so much data on social media is; deriving a meaningful on textual information.

e) Social media data is unstructured. Unlike other customer from retail, banking etc., which is structured, data on social media is unstructured.

3. **Identify three breakthrough innovations that confirm that the data scientists, managers and other members of the corporate team were thinking data analytically in this segment.**

Facebook recently unveiled its Employment segment. This was a direct result of user preferences and their tracking which made this possible. Facebook analyzed millions of user's data and came to the conclusion using Hadoop and Watson that users wanted the inclusion of an employment portal on the application. This could never have been possible without conclusive evidence offered by Facebook Data analytics that users really wanted a platform for finding jobs and for employers to post job openings. This recent progress and launch of this feature would make Facebook more useful to its users.

One of the main features that has distinguished LinkedIn from the other major social-media platforms, such as Facebook and Twitter, has been the ability to see who has viewed your profile. Now, by tapping into the power of big data, LinkedIn's new layout for "Who's Viewed Your Profile" includes impressive analytics and real-time "actionable insights" meant to increase profile visibility and enhance one's professional brand. Before, users could only see how often their profile was viewed and a list of the most recent users to check out their page. Now, LinkedIn breaks down the data even further, showing the industry viewers work in, the keyword searches that brought them to a profile, how they found a specific user, what regions they live in, what profession they are in and what companies they work for.

With a huge amount of unstructured data coming across each day, Facebook slowly realized that it needs a platform to speed up the entire analysis part. That's when it developed **Scuba**, which could help the Hadoop developers dive into the massive data sets and carry on ad- hoc analyses in real-time. Facebook was not initially prepared to run across multiple data centers and a single break-down could cause the entire platform to crash. Scuba, another Big data platform, allows the developers to store bulk in-memory data, which speeds up the informational analysis. It implements small software agents that collect the data from multiple data centers and compresses it into the log data format. Now this compressed log data gets compressed by Scuba into the memory systems which are instantly accessible.

4. **How has big data fundamentally changed management strategy in this business sector?**

a) **Improve strategies and maneuver for success.**
By using technology, big data, tools, analytics, and human intelligence (data scientists), organizations can identify critical data that will help them push their business forward. Social Media Strategies shouldn't depend on sheer numbers alone such as the number of followers, retweets, or likes. Instead, it should correlate metric standards with key performance indicators (KPIs).

b) **Increasing demand for hiring new people:**
As technology automates big data processing and collection, there is an increased need for hiring the right people that aren't necessarily marketing experts. Database engineers, computer scientists, and statisticians are needed to filter big data and give them structure .

c) Improved advertising strategies:
Companies receive data that tells them who their customers are, where they are and what they want. Everything on social media is designed to make consumer's lives easier and better.

d) Companies turn to employees for amplification:
Nearly 80% of businesses now have a dedicated social media team. But many still struggle to reach an audience. 2016 see companies turn increasingly to an underused resource in the effort to get the word out: their own employees. Employee social advocacy programs, which encourage staff to share updates about the business on their own social media accounts, have grown by 191% since 2013 and are due to take off in the year ahead.

e) Companies wade into social messaging: There are nearly 4 billion global active users of messaging apps, from WhatsApp and Facebook Messenger to WeChat and Kik. In fact, the top five apps in the world in terms of frequency of use are all messaging apps. Users are popping them open more often than even Facebook or Instagram. Messaging is already emerging as a key channel for one-on-one social customer service. Twitter lifted its 140- character limit and follow requirements on direct messages earlier this year with customer support in mind, and Facebook Messenger has been busy piloting customer service features of its own.

f) Social media advertising hits its stride: There is an exponential increase in advertisements on social media feeds. That probably means they're working. In contrast to old-fashioned banner ads, the new generation of "native" social media ads like sponsored posts on Facebook and Instagram and promoted tweets on Twitter look and act a lot like normal updates from friends and followers. They're also targeted with increasing precision. Advertisers are now able to drill down not just by age and gender, but by interests, location, company affiliation, role, and more. So the ads we get are probably the ones you actually want to see. For all those reasons, companies ramped up social media advertising in 2015, with spending increasing 33.5% to nearly $24 billion–a figure that's all the more impressive, because just a few years ago that number was $0. By 2017, social media ads may account for a full 16% of all digital ad spend globally. Fueling the growth is a host of new tools that let small businesses design and pay for social media ads in a few clicks, simplifying a process that was once the exclusive domain of high-priced media buyers.

g) Social media eats the world: Social media is exploding. Last year, Facebook more than doubled its daily video views to 8 billion, reportedly overtaking YouTube. Twitter launched native video of its own in 2015, while Snapchat now reports 6 billion daily video views in its own right. In total, adult users now consume a total of 66 minutes of online video each and every day. Around the world, social media is quickly becoming standard operating procedure at companies. Facebook, Twitter, Instagram, LinkedIn, and other networks have fundamentally changed how companies reach and interact with customers, offer products and services, communicate with employees, and—in a nutshell—do business

Problem Statement:
Now-a-days social media is representing the public sentiment and opinion about current events. Social media is transforming like a perfect platform to share public emotions about any topic and has a significant impact on overall public opinion. With the advent of social media, the information about public feelings has become abundant. Especially, twitter has attracted a lot of attention from researchers for studying the public sentiments. Stock market prediction on the basis of public sentiments expressed on twitter has been an intriguing field of research. So, how well do the negative comments in social media(twitter) correlate with market share of a company (Anthem Inc.,)?