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1. Introduction

In 2022, the brand reputation was affected to varying degrees because both Medibank and Optus suffered cyber-attacks. This report will be divided into nine parts, including the critical analysis and comparison of the current social media strategies of the two brands. Furthermore, according to existing social media strategies, this report also provides some considerations and suggestions.

2. Critical Analysis

2.1. Critical Analysis of the current social media strategy

First, analyse Medibank's twitter status from July to December. Most of Medibank's tweets are in the form of text both before and after the attack as shown in Figure 1, with a small number are tweets with link, and there are almost no tweets with photos and videos. Figure 2 shows the frequency of tweets and replies. The frequency of tweets and replies on Medibank was the highest in October while the lowest in July. There was a positive correlation between the two and Medibank did not tweet in September. Based on the Figure 3, Medibank posted only a small amount before the cyber-attack, evenly distributed in three stages: morning, afternoon, and evening.

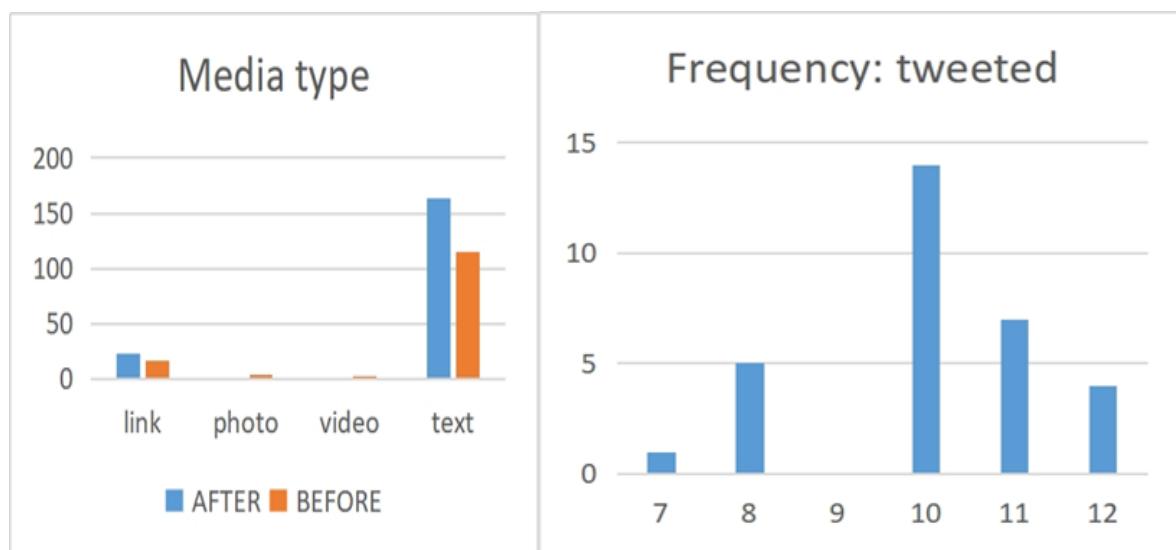


Figure 1

Figure 2

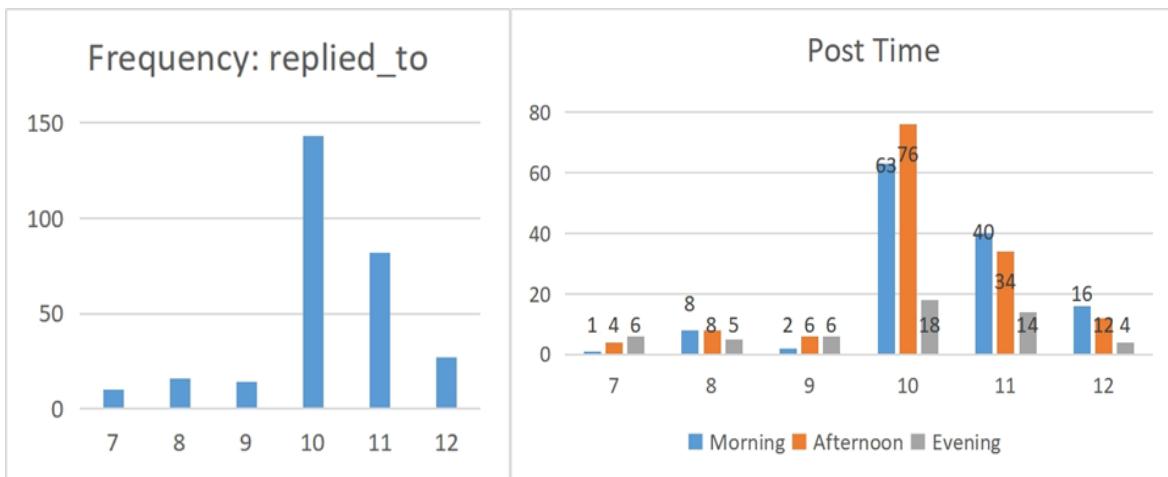


Figure 2

Figure 3

The following Figure 4 is the most concerned tweet of users was about Medibank's updated results regarding tracking cybercrime after the network attack. This shows that users are still more concerned about this matter. Consequently, Medibank pays little attention to Twitter which results in low user engagement and affinity between users.



Figure 4

Second, analyze the status of Twitter in Optus. According to Figure 5, the types of Optus posts on Twitter changed little before and after the network attack. In terms of frequency, Optus posted nearly 50 tweeted posts in the first month after receiving the attacks, equivalent to at least one post a day. Optus responded ten times more than Medibank, averaging more than 500 responses per month, compared to nearly 900 in August and September. As for the release time, it was found that they usually posted in the evening, followed by a high frequency in the afternoon. This shows that Optus is focused on social media.

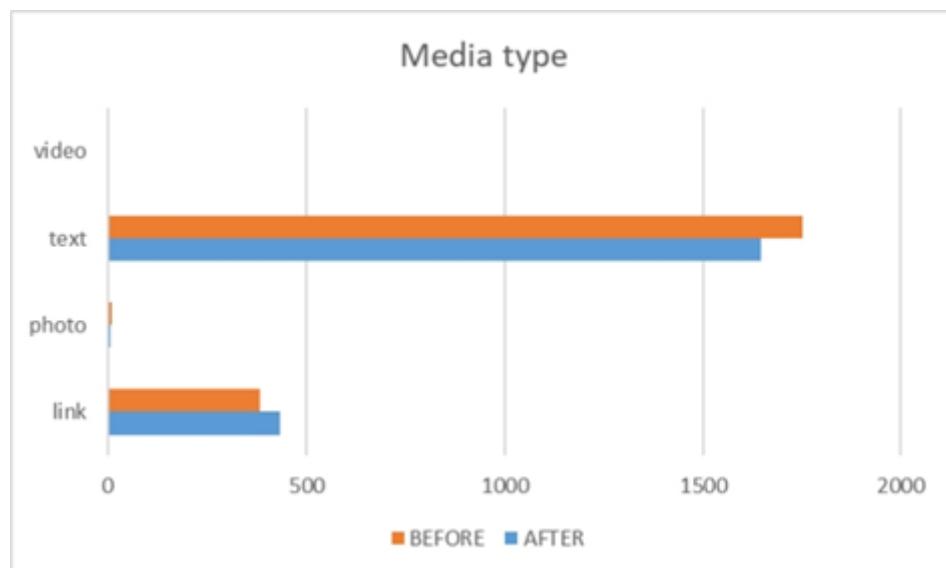


Figure 5

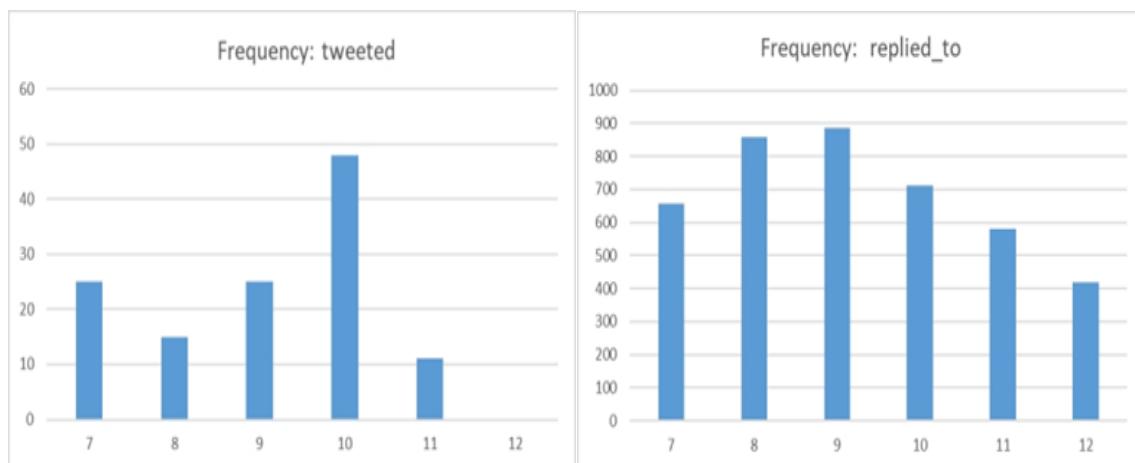


Figure 6

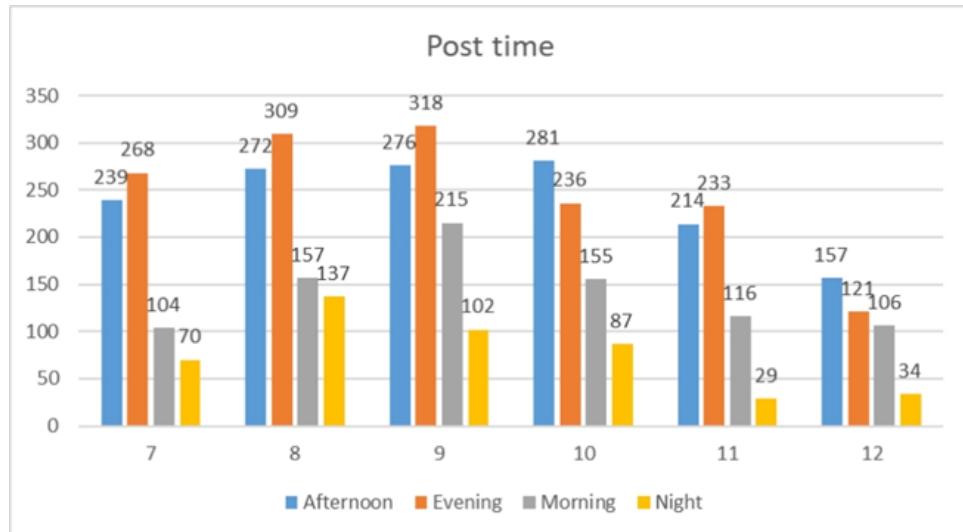


Figure 7

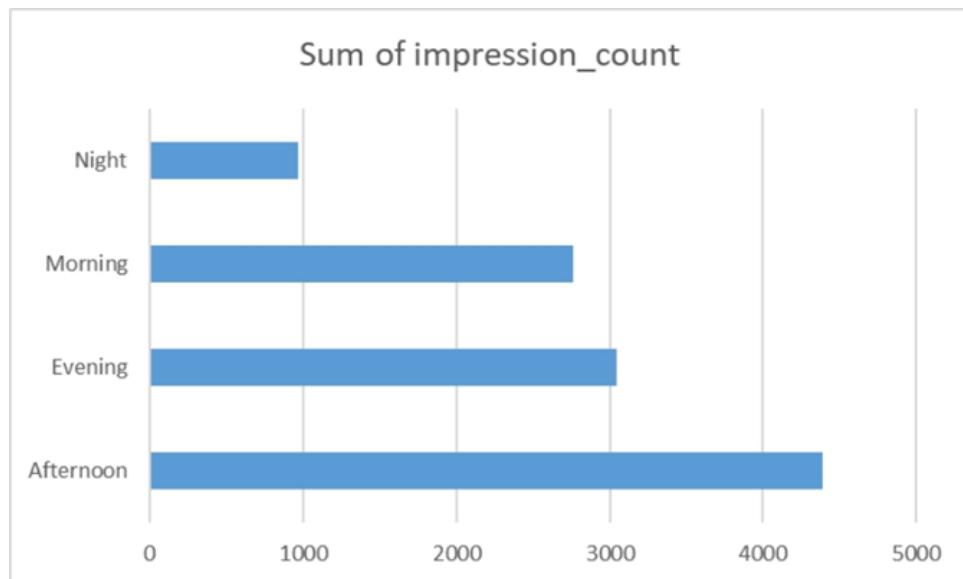


Figure 8

It seems that Optus's comments and users' concerns were not affected by cyberattack. Before the cyber-attack, the most popular user attention was the new chief's speech video. After the cyber-attack, the Favorite of all the Optus posts was an advertisement with iPhone graphics. This indicates that cyberattacks have little impact on Optus's

network, or that their online operation strategy was effective reducing the impact of the attack.



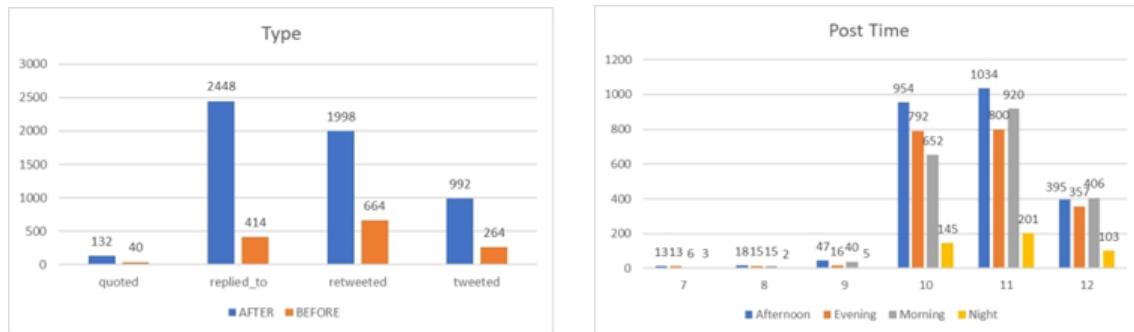
Figure 9



Figure 10

2.2. Critical Analysis of customer engagement on Twitter

In this section, we will analyze customer activity on Twitter from Medibank and Optus. Overall, customer engagement was significantly higher after the cyber-attack compared to before. After the attack, customers had 2,448 replied to messages, the highest number of replied to messages among all categories. Additionally, as shown in the "post time" screenshot, user engagement is concentrated in the month of October, November, and December, with high engagement in both morning, middle and evening. This shows that the cyber-attack caused a significant response from users.



The following screenshots are from the comments that the most likes by users before and after the attack. Jeremy, a network security worker, his content is mainly in response to the cyber-attack. Although the official release date is 10.26, the actual attack date is 10.12. It is noteworthy that the cyber-attacks have also increased discussion among Medibank users.

Jeremy Kirk (@jkirk@infosec.exchange)
@Jeremy_Kirk

Holy moly. @nickbonyhady obtained the ransom note sent to @medibank. Unless @medibank pays, the group is threatening to email 1,000 people their own health information, including politicians, LGBT activists, actors. Group says they have 200GB of data.

medibank

from Oct 2022

The Sydney Morning Herald

smh.com.au
Medibank hackers threaten to release stolen health data in ransom demand”
The hackers claim they will email Medibank’s most prominent 1000 customers and say they have information on health diagnoses.

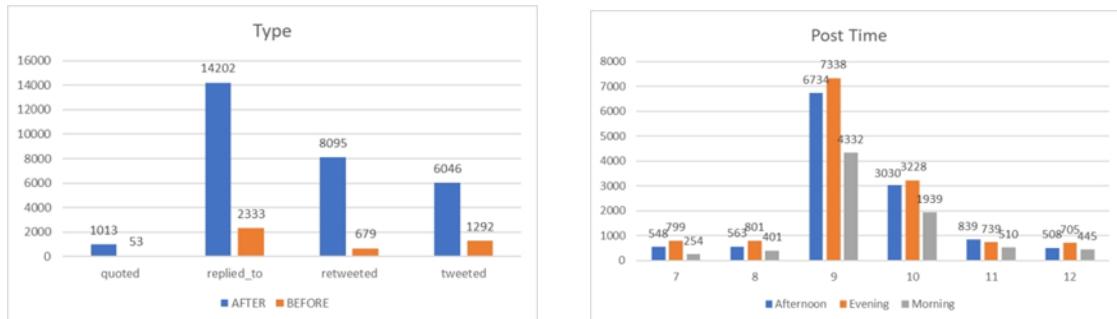
3:32 PM - Oct 19, 2022

71 Retweets 15 Quotes 134 Likes 11 Bookmarks

Comment Reply Like Save Share

The user of Optus has the same type of engagement as Medibank. As can be seen from the screenshot of "type", there are 1013 more quoted tweets after the network attack. The most popular type of reply to was 14,202 after the attack. Although this number is much larger than that of Medibank's, it shows that users prefer the same approach before and after the attack. According to the "post time" data, users had the

most active discussions in September and October. The number of discussions peaked at 7,338 in the evening of September, which was much larger than that of Medibank but with the same type of engagement.



Additionally, the two comments that received the most likes before and after the attack were captured. A comparison of these two comments shows that, like Medibank, users prefer to participate in discussion and current events.

Mark Langham @MarkLangham2

I wonder what @Optus will do once @GladysB is charged with criminal activity? Or maybe they don't care.

I wonder if the general public will care when choosing a phone/internet provider?

7:12 AM · Jul 22, 2022

44 Retweets 3 Quotes 232 Likes

Yug Nivek @YugNivek · Jul 22, 2022

Most will have no idea

Wattlecosmos @wattlecosmos · Jul 22, 2022

It's by design and the public have long accepted the puppy. It is now time for something completely different...

john forrest ❤️💛💚 Prole @JFor... · Jul 22, 2022

No one cares if they get a better deal

Terence Carter @terencecarter · Jul 22, 2022

Odd that they employed her before the findings were released. And I mean very odd.

Paul Bongiorno @PaulBongiorno

Bam! @PatsKarvelas calls @Optus out on @InsidersABC ... time for a national government to look after the public's interest and not the bottom line of mega foreign owned corporations.

6:43 AM · Oct 2, 2022

324 Retweets 6 Quotes 1,914 Likes 2 Bookmarks

The Randolorian @SNoonan82 · Oct 2, 2022

Did a prior coalition communication minister previously work for Optus?

Simon Rosenberg @simon_rosenberg · Oct 2, 2022

Neoliberalism is nearly dead.

And surely the #OptusHack is the last nail in that mouldy coffin.

These mega corporates simply can't be trusted with self-regulation. #Insiders #auspol

Samantha T 📻💻 @SamT57498755 · Oct 2, 2022

I've listened to many podcasts this week with many different cyber security experts and the do all day the same thing- it was basic and was caused be serious lapse in basic security

Sue-Ellen Smith @Sue0606 · Oct 2, 2022

I always appreciate PK's commentary on #Insiders. Excellent observations

3. Sentiment analysis based on R

Sentiment analysis can be defined as the process of digital text, according to the content extracted from texts such as posts, articles and product reviews on social media. Using R for sentiment analysis can divide the customer's attitude into positive, negative and neutral. This tool avoids the personal biases of human reviewers to better understand people's real opinions. Furthermore, it can also help companies understand real feedback from customers to improve their products and services. In this part of the article, R is used for text cleaning, keyword and sentiment analysis, the specific code can be queried in the appendix.

3.1. Text Cleaning

Different tools in R can filter out unnecessary characters for text cleaning. Its purpose is to mine true information and reduce the impact of invalid content on emotional analysis. In the process of text cleaning, two packages are used, "readxl" to read the file and "stringr" to remove special characters. Function "gsub ()" is mainly used to delete special characters and non-letters. The cleaned text is placed in the last column of the original files as the following screenshot, which is easier to understand and clearer than the original text.

Showing 1 to 22 of 323 entries, 16 total columns

Console Terminal Background Jobs

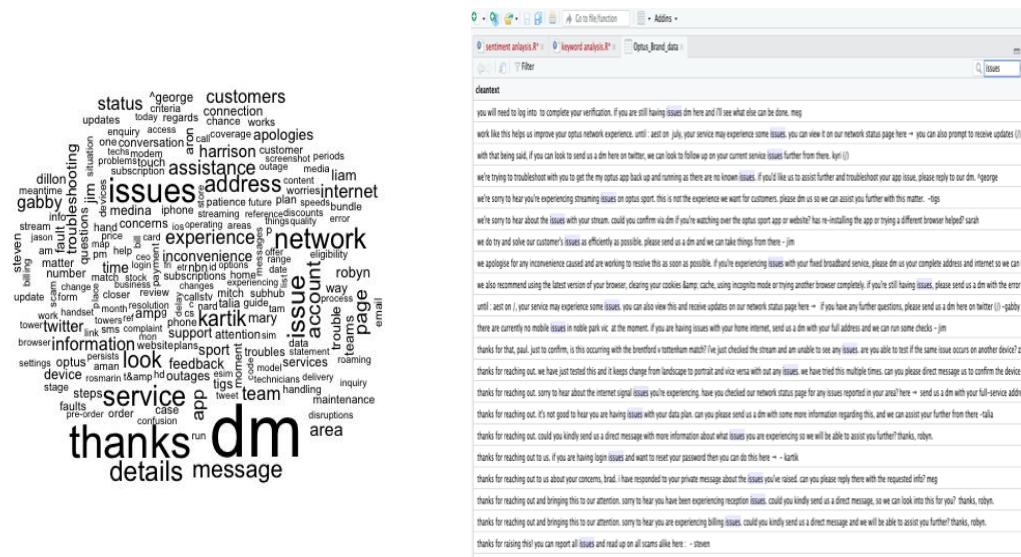
R 4.2.3 - -

```
> #Optus_Customer_data<-read_excel("~/Desktop/INF55730 Assignment2/Customer engagement data-20230402/Customer_Tweets_Optus.xlsx")  
> #Medibank_Customer_data<-read_excel("~/Desktop/INF55730 Assignment2/Customer engagement data-20230402/Customer_Tweets_Medibnk.xlsx")  
  
> #, clean  
> clean_text<-function(x){  
+ x<-tolower(x)  
+ x<-gsub("[[:blank:]]","",x)  
+ x<-gsub("[[:punct:]]","",x)  
+ x<-gsub("[[:alpha:][[:punct:]][[:space:]]","",x)  
+ return(x)  
}  
> Optus_Brand_Data$cleanText<-clean_text(Optus_Brand_Data$text)  
> Medibnk_Brand_Data$cleanText<-clean_text(Medibnk_Brand_Data$text)  
> Optus_Customer_Data$cleanText<-clean_text(Optus_Customer_Data$text)  
> Medibnk_Customer_Data$cleanText<-clean_text(Medibnk_Customer_Data$text)  
> View(Medibnk_Brand_Data)  
> View(Medibnk_Customer_Data)  
> View(Optus_Brand_Data)
```

3.2. Keyword Analysis

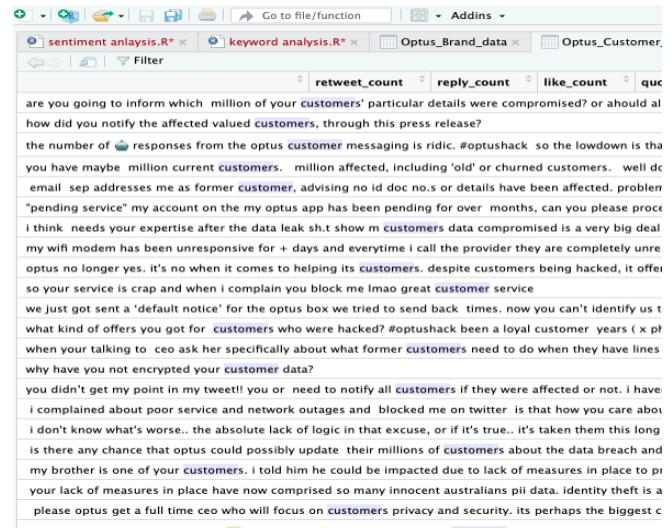
Keywords can be understood as words that can represent the characteristics of the content. Keyword extraction is very important when there is a lot of content. In general, nouns express the main idea of a text better than any other words. In order to understand the topic of customer discussion faster, this article selected the content which contains main keywords in two brands' data for analysis and summary. The two packages used in this process are "udpipe" and "wordcloud". "udpipe" enables text parsing, automatic keyword extraction, noun phrase extraction. "wordcloud" can form images of words used in text, with the size of each word in the picture indicating its frequency or importance. In Optus's data, ten key words are selected to analyze the topics that customers care about, furthermore, which shows that most of the content is about data leakage discussion.

In Optus's brand Tweets, text searches were conducted on "issues", "network", "detail", "service", "message" respectively. It is not difficult to find that these keywords often appear in the same text at the same time. In the tweets of the brand, customers reply to the content about the products and data issues.

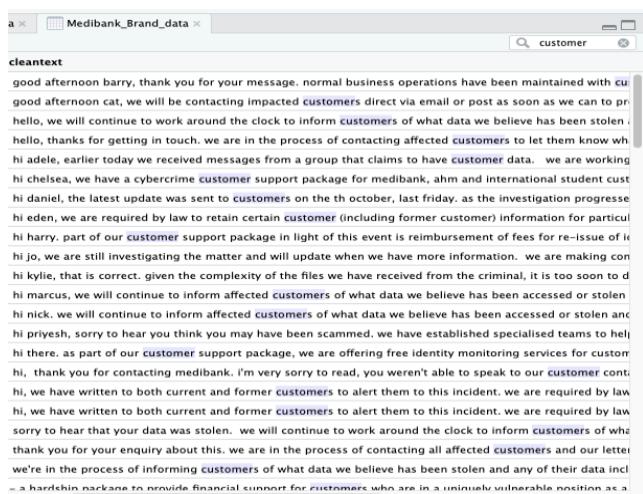


In Optus's customer Tweets, "customer", "email", "breach", "data" and "information" were selected as keywords. "data" and another keyword "breach" often appear

together, and the contents containing "customer" are mostly about customer privacy and information security, such as email and telephone. This means that most of the content in customers' tweets is discussing the problem of customer information security caused by data breach.



In Medibank's brand Tweets, text search was conducted on ", "data", "health" and "cyber" "message." It is not difficult to find that the most discussed in brand Tweets is the impact of Internet events on customers.



In Medibank's customer Tweets, "customers", "insurance", "hacker", "data" and "health" were selected as keywords. "health" and "insurance" often appear together,

which means that customers' insurance concerns are mainly health insurance. The content about "customer", "hacker" and "data" is mainly about the leakage of customer data caused by hackers. So, the topic most discussed by customers was the data leak caused by hacking attacks.



3.3. Sentiment Analysis

Descriptive analysis is based on sentiment analysis of customer's tweets, using the "tidyverse" and "ggplot" packages to visualize the data. Through the comparison of visual results to better observe the changes in customer Sentiment.

First, the text content was emotionally scored using the “SentimentAnalysis” and “SnowballC” packages, and each content was classified as positive, negative or neutral. In the process, two new files are created that contain the date the tweet was posted, the content, and the sentiment category, as shown in the screenshot below.

```

sentiment analysis.R* | Optus_Tweets | keyword analysis.R*
  Source on Save | Run | Source | Environment | History | Connections | Tutorial
  X1 = gsub("http://[a-zA-Z0-9]+", "", X)
  X2 = gsub("\d+", "", X)
  X3 = gsub("#[^\w+]", "", X)
  X4 = gsub("[[:alnum:][:punct:][:space:]]", "", X)
  return(X)
}

# 3. sentiment
sentiment = analyzeSentiment(Optus_Customer_datacleanText)
sentimentPolarity = convertToDirection(sentiment$SentimentQAP)
Optus_Tweets = data.frame(Date = Optus_Customer_data$created_at, tweets=Optus_Customer_data$cleanText, sentiment = sentimentPolarity)
Medibank_Tweets = data.frame(Date = Medibank_Customer_data$created_at, tweets=Medibank_Customer_data$cleanText, sentiment = sentimentPolarity)

# 4. sentiment
sentiment = analyzeSentiment(Medibank_Customer_datacleanText)
sentimentPolarity = convertToDirection(sentiment$SentimentQAP)
Medibank_Tweets = data.frame(Date = Medibank_Customer_data$created_at, tweets=Medibank_Customer_data$cleanText, sentiment = sentimentPolarity)

```

Environment | History | Connections | Tutorial | Import Dataset | 103 MB | List | Global Environment | Data | Values | sentimentPolarity | Factor w/ 3 levels "negative","neutral",...: 1 2 3 1 3 NA 2 2 3.

Sentiment analysis.R* | Medibank_Tweets | Optus_Tweets | keyword analysis.R*

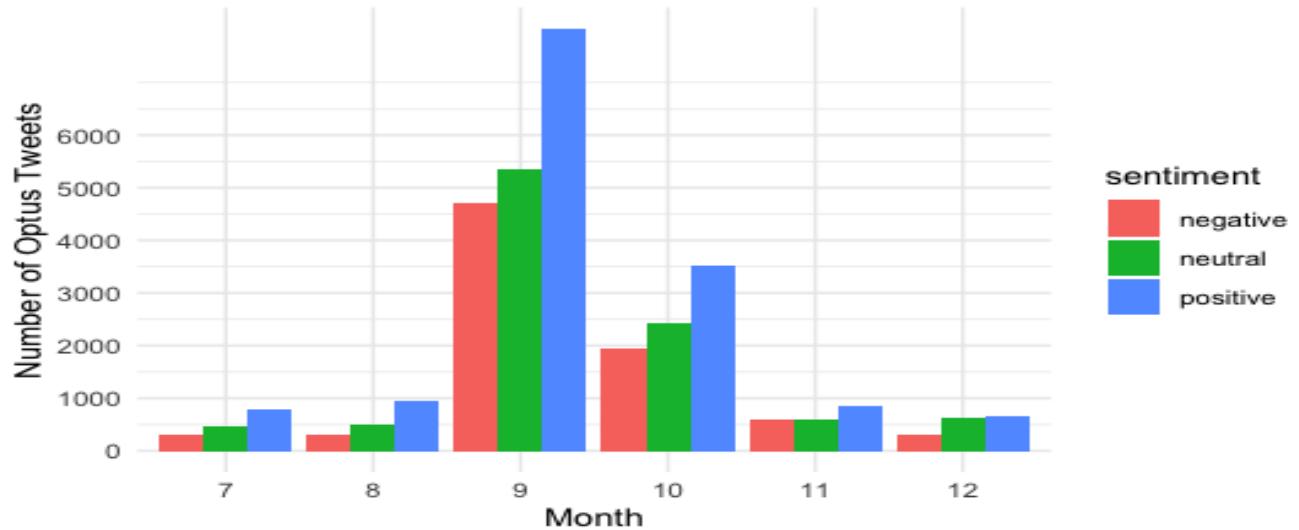
Filter

	Date	tweets	sentiment
1	2022-12-31T23:43:20.000Z	yeah, but you still got hacked	negative
2	2022-12-30T15:24:29.000Z	russian hackers hiding behind god knows how ma...	neutral
3	2022-12-29T23:19:21.000Z	prime minister albanese australia help new years a...	positive
4	2022-12-29T22:36:29.000Z	how do we arrest unknown overseas perpetrators?	negative
5	2022-12-29T22:00:37.000Z	arrests? oh, you must be referring to the russian g...	positive
6	2022-12-29T01:18:59.000Z		NA
7	2022-12-26T16:10:29.000Z	tf? just got this email from #facebook saying someo...	neutral
8	2022-12-26T16:07:27.000Z	tf? just got this email from #facebook saying someon...	neutral
9	2022-12-25T12:43:18.000Z	#alliwantforchristmas is my boobs approved so i can ...	positive
10	2022-12-25T03:53:13.000Z	rt this is unacceptable, i just provided my details for...	positive
11	2022-12-24T20:54:39.000Z	this. more and more centralised security "experts" / ...	positive
12	2022-12-24T06:49:12.000Z	i took out travel insurance from #ahntravelinsurance ...	negative
13	2022-12-24T06:18:15.000Z	. and hacks spark warning over identity theft risks fr...	negative
14	2022-12-24T02:52:32.000Z	more australians are learning their personal informati...	negative
15	2022-12-24T00:58:38.000Z	omg! this!!! so hecking frustrating! #whatsintegrati...	negative
16	2022-12-23T23:51:13.000Z	that's the worst.	negative
17	2022-12-23T22:55:20.000Z	rt it's ironic that it's easier for hackers to access my ...	positive
18	2022-12-23T22:07:35.000Z	rt it's ironic that it's easier for hackers to access my ...	positive
19	2022-12-23T21:57:47.000Z	probably the same with mygov. i tried to link centrel...	positive
20	2022-12-23T19:52:47.000Z	rt it's ironic that it's easier for hackers to access my ...	positive
21	2022-12-23T19:52:08.000Z	they'll give you like everyone else a big fuck all. no ...	neutral

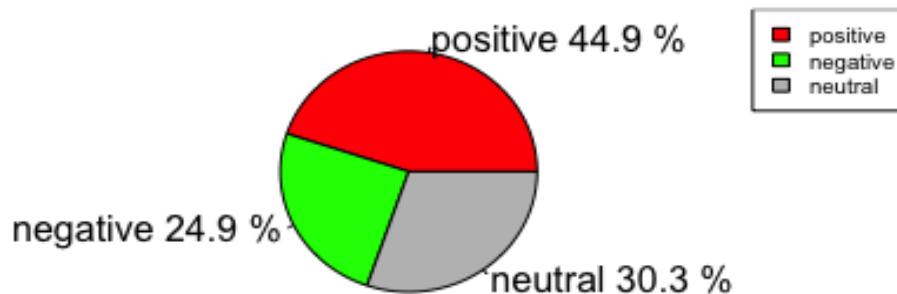
Second, packages "tidyverse" and "ggplot2" are being used to visualize the data, allowing for a clearer understanding of customer sentiment. As the chart below shows, the number of customer tweets suddenly increased about both brands after the attack. However, the positive percentage changed to less than 50% after the attack.

Third, create a visual chart by counting the number of different emotions to better understand the customer' sentiment. As shown in the visualization of Optus's customer tweets, the number of tweets about Optus peaked in September, when the hack was launched and started to decline in October. Among all the data, 44.9% were positive,

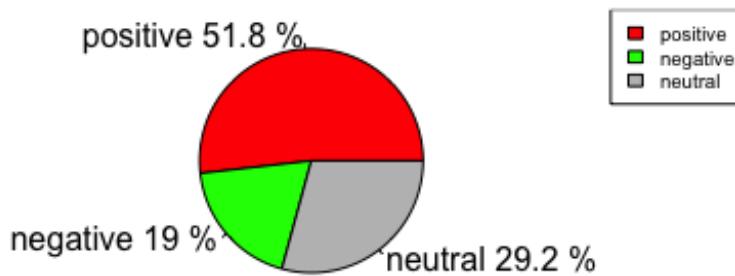
24.9% were negative and 30.3% were neutral. Before the attack, the highest proportion of active was 51.8%, the negative percentage increased by 6.5%.



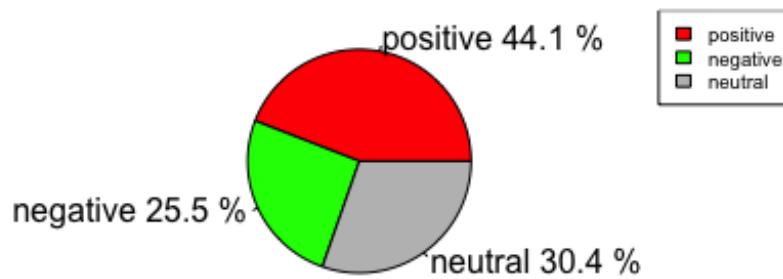
Total Optus



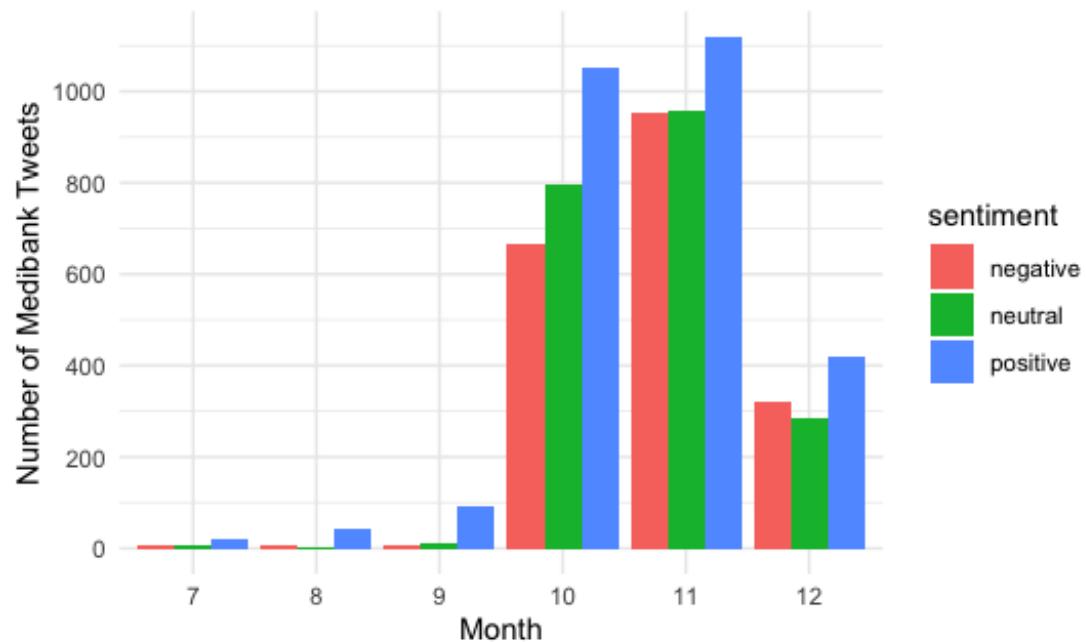
Before Attacked Optus



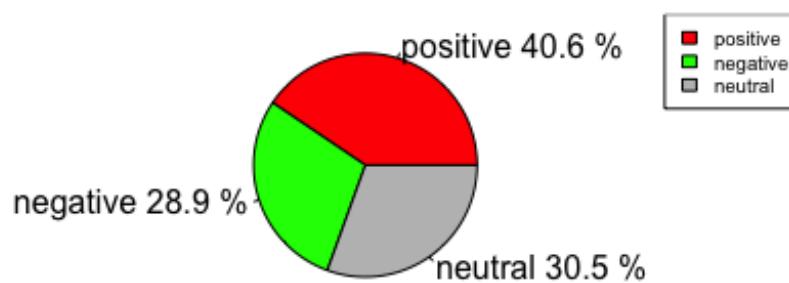
After Attacked Optus



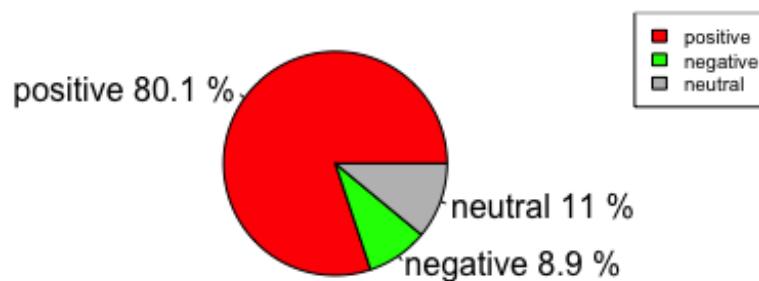
As shown in the visualization of Medibank's customer tweets. Before the hacking incident, the number of customer tweets was low. The level of discussion peaked between October and November and declined in December. Positive sentiment accounted for 40.6% of all the data, but it was as high as 80.1% before the attack and only 39.4% after the attack. Negative emotion increased by 21.6% and neutral increased by 28.5% after the attack. This data shows that the data breach has had a significant impact on customers' emotional impact.

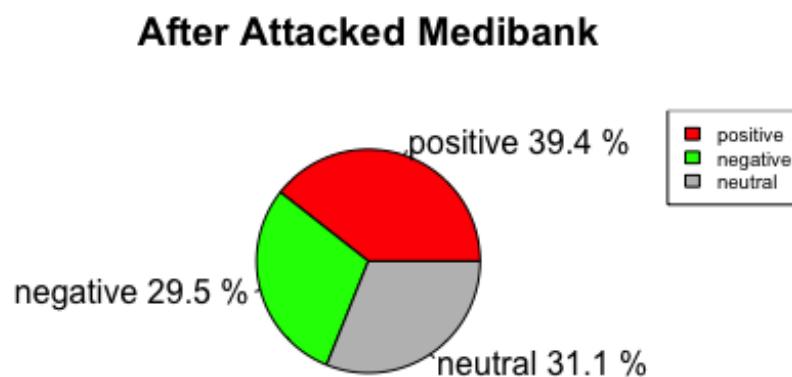
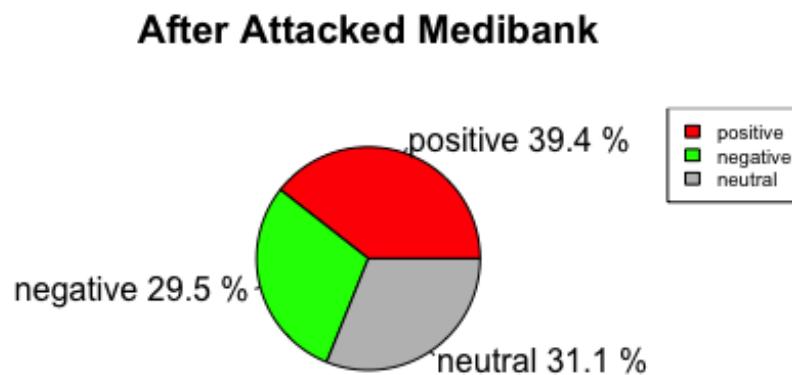


Total Medibank



Before Attacked Medibank





4. NodeXL Social network Analysis

In both excel data, there are several columns, among which we need to extract 'id', 'author_id', 'in_reply_to_user_id ', 'type' and 'referenced_tweet_id'. The 'type' represents the type of tweet, and here we have selected only 'replied_to' and 'quoted'. These two types are chosen because 'retweeted' does not have the 'referred_tweet_id', and 'retweets' in Twitter cannot express the user's own opinion or comments; therefore, the influence is still from the original tweet rather than from the retweeting user.

The author of 'referenced_tweet_id' is found by vlookup in excel and is used as the author of the original tweet, while 'author_id' is used as the author of the response to the original tweet. Then the rows where the author could not be found are removed. At this point we are done with cleaning the data. The above steps are applied to each of the

two excel data to get the cleaned data. Then we put it into NodeXL for social network analysis.

Through Overall Metrics we can see that there is a big difference between the two companies in terms of vertices and edges (Figure 11). First, this is related to the raw excel data, where there is a huge difference in the amount of data between the two companies. This may be related to the number of users, according to the Ministry of Finance published data Optus has 10.2million users (Treasury, 2020). Medibank, on the other hand, has only 3.9million subscribers (Medibank, n.d.). The difference in the number of customers causes a gap in the data on twitter, which is ultimately reflected in the number of vertices and edges in the social network analysis.

A	B	A	B
Graph Metric	Value	Graph Metric	Value
1 Graph Type	Directed	1 Graph Type	Directed
2 Vertices	1279	2 Vertices	6007
3		3	
4 Unique Edges	1251	4 Unique Edges	6948
5 Edges With Duplicates	676	5 Edges With Duplicates	3591
6 Total Edges	1927	6 Total Edges	10539
7		7	
8 Self-Loops	222	8 Self-Loops	1053
9		9	
10 Reciprocated Vertex Pair Ratio	0.13790256	10 Reciprocated Vertex Pair Ratio	0.226282051
11 Reciprocated Edge Ratio	0.242380261	11 Reciprocated Edge Ratio	0.369053842
12		12	
13 Connected Components	167	13 Connected Components	807
14 Single-Vertex Connected Components	27	14 Single-Vertex Connected Components	201
15 Maximum Vertices in a Connected Component	794	15 Maximum Vertices in a Connected Component	4208
16 Maximum Edges in a Connected Component	1405	16 Maximum Edges in a Connected Component	8542
17		17	
18 Maximum Geodesic Distance (Diameter)	19	18 Maximum Geodesic Distance (Diameter)	21
19 Average Geodesic Distance	5.256291	19 Average Geodesic Distance	6.399503
20		20	
21 Graph Density	0.000843039	21 Graph Density	0.000212096
22 Modularity	Not Applicable	22 Modularity	Not Applicable
23		23	
24 NodeXL Version	1.0.1.448	24 NodeXL Version	1.0.1.448
25		25	
26		26	

Figure 11

Key influencers of Optus:

In the Optus data, the highest number in-degree and the highest number out-degree is the same user '299026077' (Figure 13 and Figure 14). This means that this user has the highest number of comments and the highest number of comments on his

comments. Using the user search, we found that this user received the first and second most comments on the following two tweets (Figure 12):

C	D	E	F	G	H	I	J	K	L
author_id	in_re	type	convert		text		retweet	reply_c	like_c
					when asking legitimate questions. I hate this so much.				
299026077	tweeted	15830064	en		Where can I get 500GB of data, unlimited call and text for under \$65 per month?		7	67	185
					Did Optus breach the contract with their customers by acting in a way that allowed criminals to steal customer data including 100 point identification?				
299026077	tweeted	15732279	en		@Optus I think you should halt all billing and direct debits until this is resolved and you pay for new passports/licences.		165	66	985

Figure 12

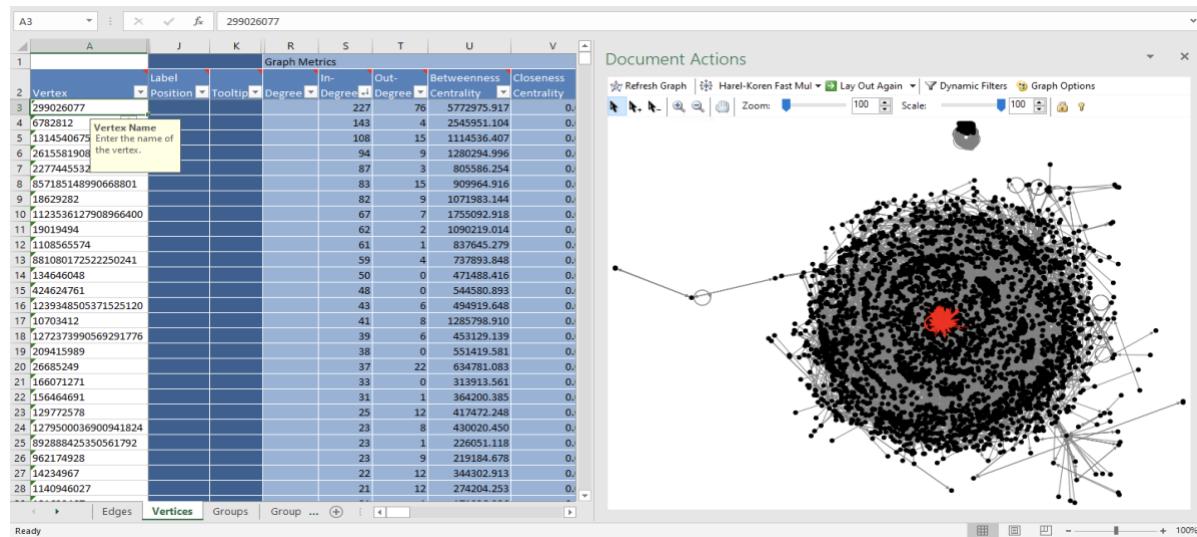


Figure 13

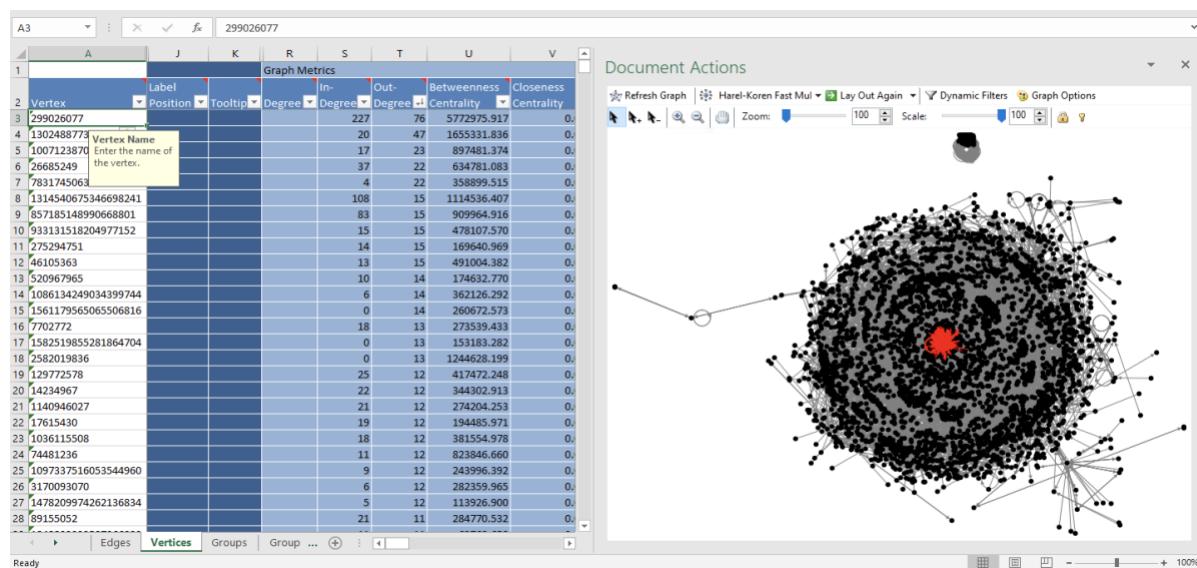


Figure 14

This shows that the user started to question the ability of Optus to protect customers' payment information after cyberattacks, and they also raised issues with Optus' fees and customer service. Many replies also confirmed that these problems existed for other users as well.

If we look at Betweenness Centrality in descending, we see the other key influencers. The first place is still '299026077'. Second place goes to '6782812', a user search reveals that this user is a broadcaster with a large following and that his most responded to post was about whether Optus could use other documents than a driver's license or passport when authenticating (Figure 15 and Figure 16). This idea was heavily commented on, and this suggestion could be adopted in the subsequent operation of Optus. The third, fifth, and sixth users were not significantly higher in-degree numbers and out-degrees (Figure 17), but their tweets had many followers (Figure 18, Figure 19 and Figure 20), and their identities had a high credibility or celebrity effect. For example, the third place (Figure 18) is a PhD, the fifth place (Figure 19) is a broadcaster, and the sixth place (Figure 20) has 92.2k followers. The fourth place does not have too many followers, and its Betweenness Centrality can be ranked fourth because of its larger out-degree, in other words, it provides a lot of replies which is second highest out-degree numbers (Figure 17 green). The users mentioned above are the key influencers that exist in the Optus data derived from social network analysis.



Figure 15

C	D	E	F	G	H	I	J	K
author_id	in_re	type	refer	convers	lang	text	retweet	reply_c
16782812		tweeted	15798087	en	Just discovered that to transfer an esim from an old phone to a new one. @Optus makes you go to a stor		0	2
16782812		tweeted	15761827	en	And @OptusSport just froze during a goal, so I missed it. Great week @Optus is having 😊		1	3
16782812		tweeted	15748818	en	RT @domknight: We need a way for companies like @Optus to confirm identity without needing our DL/passport/Medicare. It should be possible...		239	136
16782812		tweeted	15734645	en	Given @Optus' appalling data breach, could @ServiceNSW @VictorDominello look into a mechanism f		17	8

Figure 16

A	J	K	R	S	T	U	V	W
1	Graph Metrics							
2	Label	Position	Tooltip	In-Degree	Out-Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality
3	299026077			227	76	5772975.917	0.000	0
4	6782812			143	4	2545951.104	0.000	0
5	1123536127908966400			67	7	1755092.918	0.000	0
6	1302488773062582275			20	47	1655331.836	0.000	0
7	10703412			41	8	1285798.910	0.000	0
8	2615581908			94	9	1280294.996	0.000	0
9	2582019836			0	13	1244628.199	0.000	0
10	1314540675346698241			108	15	1114536.407	0.000	0
11	19019494			62	2	1090219.014	0.000	0
12	18629282			82	9	1071983.144	0.000	0
13	857185148990668801			83	15	909964.916	0.000	0
14	1007123870870994945			17	23	897481.374	0.000	0

Figure 17

← Dr Kate Miller @drkatemiller@mastodon.social
36.3K Tweets



Follow

Dr Kate Miller @drkatemiller@mastodon.social
@DrKate_Miller

Geriatrician, wife and Mum. FRACP. Jokes and historical pearls on tap. Health UX. Opinions are my own and do not reflect any organisation I work for.

⌚ Australia 🗓 Joined May 2019
4,928 Following 24K Followers

← Trevor Long ✅
95.5K Tweets



Follow

Trevor Long ✅
@trevorlong

Dad, Husband, Speaker, Broadcaster & Technology Commentator @TheTodayShow , @ACurrentAffair & radio across Australia; podcaster & Editor @EFTM

⌚ Sydney 🌐 eftm.com.au 🗓 Joined November 2007
444 Following 13.9K Followers

Figure 18

Figure 19



Ronni Salt

@RonniSalt

Australian political commentator. Sometimes investigates stuff. Twitter edge lord's pin-up girl. Fricking hilarious. Likes = acknowledgments only. She/her

🔗 To the left ⌂ buyamecoffee.com/sronniz 📅 Joined July 2014

5,292 Following 92.2K Followers

Figure 20

Medibank's key influencers:

In the Medibank data, the highest number in-degree and the highest number out-degree is the same user '18629282' (Figure 21 and Figure 22). This user was found to be a former cybersecurity journalist and cybersecurity expert (Figure 23). His two most retweeted and replied tweets were about the cyberattack on Medibank and the attack related to Russia (Figure 24). The second of these led directly to a subsequent tweet from the Russian Foreign Ministry. The Russian Ministry of Foreign Affairs is also the account with the second highest betweenness centrality in this data. So, there is no doubt that '18629282' is the key influencer.

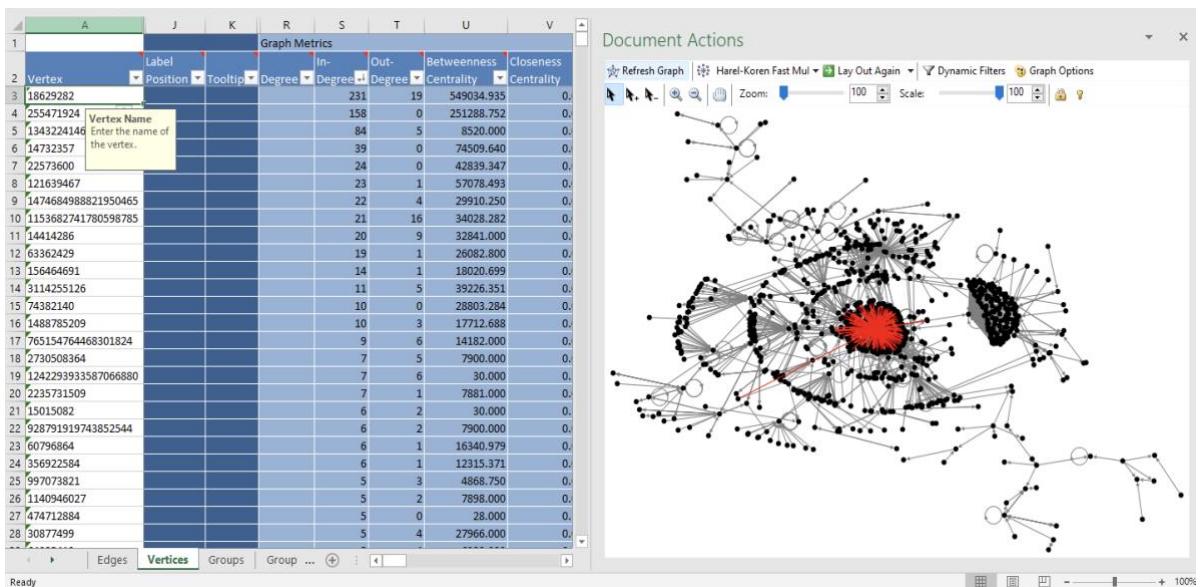


Figure 21

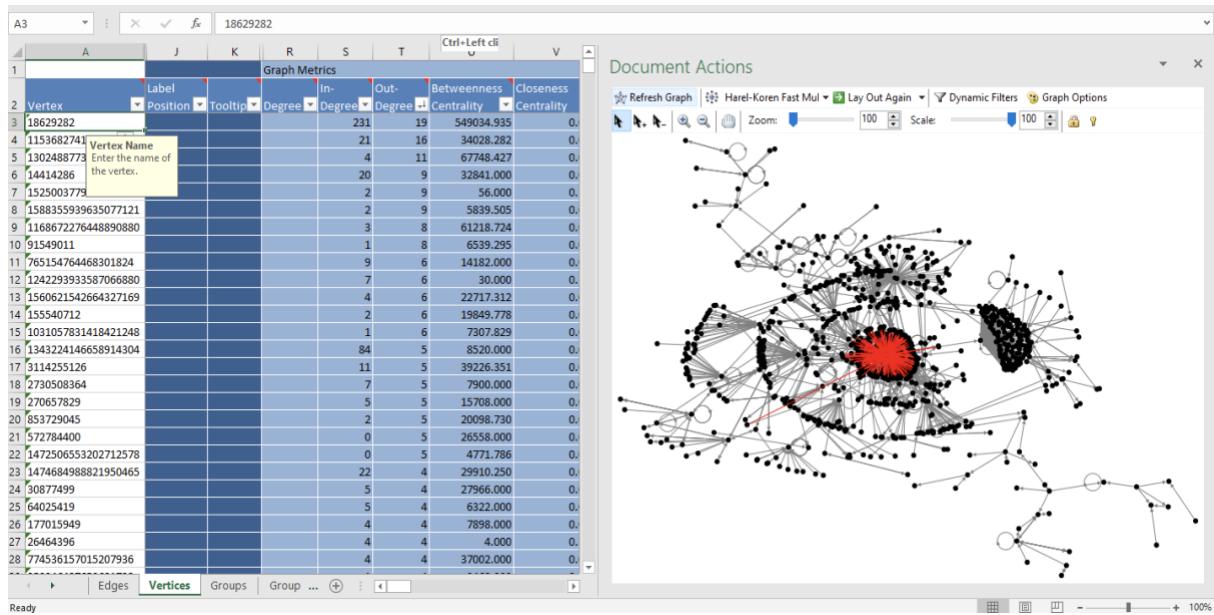


Figure 22



Figure 23

author_id	text	retweet	reply_c
18629282	BREAKING: @AusFedPolice say those responsible for the @medibank breach area in Russia. Won't name the individuals but AFP says it knows their names. #auspol #infosec	44	22
	BREAKING: Australian insurer @medibank says a ransomware group claims it has compromised personal data. This comes two days after it said an investigation so far indicated no customer data was removed. ASX: https://t.co/v2nmB0HFIG #auspol #infosec #databreach		
18629282		117	18

Figure 24

By sorting the tweets in descending order of Betweenness Centrality, we can see that the Russian Ministry of Foreign Affairs, mentioned above, is in second place (Figure 25 and Figure 26). The image also shows that this Twitter account directly divides the entire graph into two parts. The other accounts connected to the Russian Ministry of Foreign Affairs account are separated from the other accounts, which means that they do not communicate with the other accounts (e.g. quotes or comments). Therefore, the account of the Russian Ministry of Foreign Affairs has a key influence on the accounts connected to it. The third position is very special: the user with the account number '98036747' connects the first account '18629282' with the second account '255471924' (Figure 27). It acts as a bridge. It is this user who connects the two accounts and makes them related to each other. It can be said that the presence of this user is crucial. The fourth one is a professional business journalist; his tweets will have strong credibility and impact (Figure 28). An overall look at the key influencers of Medibank shows that all of them have a strong I.T., Cybersecurity or official background, unlike key influencers of Optus.

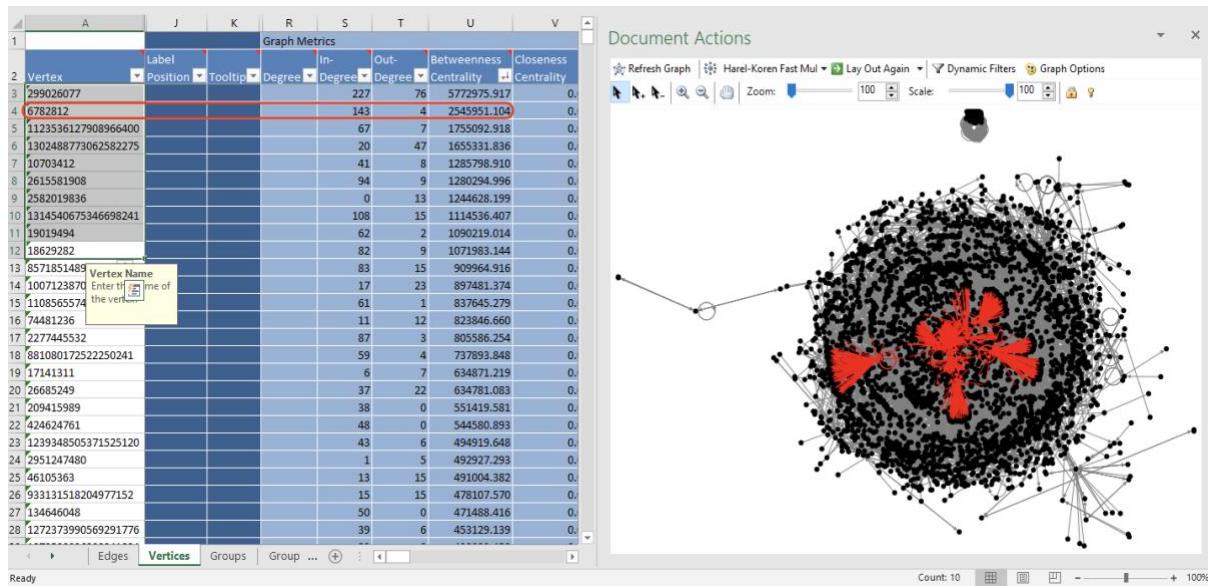


Figure 25



Figure 26

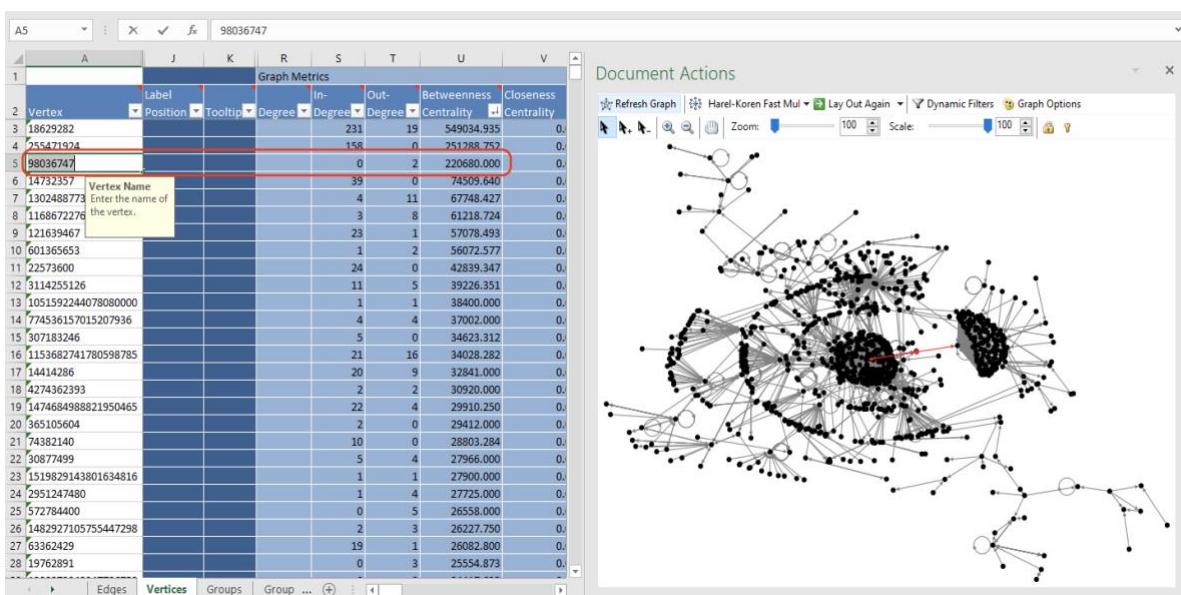


Figure 27



Figure 28



5. Comparison of media strategies

A comparative analysis of the social media strategies of Medibank and Optus can be conducted by comparing their approaches in terms of content, frequency, customer service, response to cyber-attacks, and customer engagement.

Firstly, by conducting a comparative analysis of the content disseminated on Twitter by the two companies, it can be discerned that Optus primarily shares information related to promoting its products and services and providing customer support through its social media channels. Medibank's content is more focused on its product promotion and some health information. Nevertheless, Optus also occasionally publishes engaging news stories and interactive content, such as a brief introduction to Marvel's upcoming movies in 2023 (Optus, 2022). Therefore, Optus is likely to appeal to a larger user base due to the greater diversity of its content offerings, while Medibank's content may be more monotonous and unable to meet the different needs and preferences of users.

Next, a comparative analysis can be conducted on the tweet frequency of Optus and Medibank.

A screenshot of the Optus Twitter profile page from 2009. The header shows the Optus logo and 419.4K Tweets. The bio reads: '@Optus_Help for 24/7 assistance, or jump on the My Optus app. @OptusSport for everything sport.' It links to a Privacy Policy. The profile picture is a yellow swirl on a green background. The footer shows the location as Australia, the website as optus.com.au, and the account was joined in June 2009. It has 8 Following and 77.4K Followers, with a note that it is not followed by anyone.

Optus 
@Optus:
@Optus_Help for 24/7 assistance, or jump on the My Optus app. @OptusSport for everything sport.
Privacy Policy: optus.com.au/about/legal/pr...
Australia  optus.com.au Joined June 2009
8 Following 77.4K Followers
Not followed by anyone you're following

Optus Twitter page (Optus, 2009)

Medibank

17.9K Tweets

medibank

...

Follow

Medibank

@medibank

Can we help? Send us a DM. Cyber event updates and support:
medibank.com.au/health-insuran...

Medical & Health Australia medibank.com.au
Joined August 2011

3,199 Following 11.6K Followers

Medibank Twitter page (Medibank, 2011)

From the two charts above, it can be observed that Optus joined Twitter in 2009 and posted a total of 419.4K tweets, while Medibank joined Twitter in 2011 and posted a total of 17.9K tweets. The two companies joined Twitter only 2 years apart, however, Optus has tweeted a total of 401.5k more tweets than Medibank. Based on the comparison results, it can be found that Optus tweets more frequently. A higher posting frequency will strengthen the connection and interaction between the company and customers, resulting in increased customer loyalty. Thus, Optus shows higher levels of engagement with customers through its increased tweet frequency, whereas Medibank's lower tweet frequency may lead to decreased customer engagement.

The third point pertains to a comparison of customer service. Optus focuses on communication and experience with customers, providing 24/7 customer service, which means customer support is available 24 hours a day, 7 days a week. Furthermore, Optus received the Customer Experience Leadership Award at a customer experience summit, demonstrating their exceptional performance in customer service. (Anonymous,2012). There is also 24/7 customer service for Medibank. While Medibank also provides 24/7 customer service, there are numerous

complaints from customers about their customer service, with 60% of the complaints received by health insurance regulatory agencies being related to Medibank. (Dunlevy, 2016). This suggests that Medibank has not adequately addressed customer issues in a timely manner. Additionally, the image below illustrates tweets related to customer service from Optus and Medibank.

Optus Twitter about customer service (Optus, no date)

Medibank Twitter about customer service (Medibank, no date)

It can be seen from the figure that Optus replies to customers more frequently than Medibank. Therefore, Optus communicates more frequently with customers to help solve problems in a timely manner, while Medibank needs to improve customer service to maintain customer satisfaction and brand reputation.

The fourth comparison pertains to the response measures taken by the two companies in the face of cyber-attacks. Optus experienced a cyber-attack on September 22, 2022, and responded quickly, such as immediately contacting the Australian Federal Police and potentially affected customers to apologize. (Cyberknow, 2022). In contrast, When Medibank was hacked on October 12, they did not start contacting potentially affected customers until a day later and did not confirm user data had been compromised until October 20 (Medibank, 2023). By comparing the strategies employed by the two companies in response to cyber-attacks, Optus has acted quickly to allay customer concerns. Medibank failed to promptly inform its users and took an extended period to confirm the data breach following a cyber-attack, which could intensify user anxieties.

Therefore, the measures taken by Optus after being attacked by the network are timelier and more effective.

Lastly, a comparison of customer engagement can be made. Based on the above customer engagement analysis and sentiment analysis, Optus took effective measures to calm customer emotions after the cyber-attack, and the number of people who still maintain high customer participation and maintain a positive attitude has dropped very little. However, Medibank experienced a significant decline in customer engagement and positive attitudes, coupled with an increase in dissatisfaction with their social media strategy. This indicates that Optus has performed better in handling the crisis compared to Medibank.

Therefore, based on the comparison of the five aspects mentioned above, it can be concluded that Optus has outperformed Medibank in terms of their social media strategy.

6. Social Media Strategy Design

6.1. Design Considerations

The provision of clear and prompt communication. In a brand crisis, it is advisable to promptly communicate the circumstances to the public, acknowledge any errors, extend a formal apology, and present viable remedies. It is imperative to disclose all relevant information, as failure to do so may result in harm to the reputation of the brand and erosion of consumer confidence. According to Wired (2018), Facebook experienced a significant security breach that impacted a potential 90 million users. Facebook acted by logging out users who were impacted and resetting their tokens. Facebook duly informed its users and the public regarding the security breach, elucidating the nature of the incident and the measures it had undertaken to safeguard its interests. Facebook collaborated with law enforcement and regulatory agencies to conduct an enquiry into the occurrence. The subject matter under consideration pertains to facilitating aid and fostering communication between patrons and service renderers. During a brand crisis, it is crucial to take proactive measures to address

customer enquiries and complaints, while providing efficient assistance and compensation. It is recommended to avoid dismissing or deleting unfavourable assessments as it could lead to a more substantial negative response.

The protection and preservation of security and privacy. During a brand crisis, it is imperative to prioritize the protection of customers' personal data and information and to take measures to prevent any additional unauthorized access or misuse. Ensuring the protection of customers' personal information and data is of utmost importance to prevent any possible breaches. The disclosure of a significant data breach by Equifax in September 2017 resulted in the exposure of personal information belonging to 147 million individuals (Srinivasan, Pitcher and Goldberg, 2017), encompassing details such as names, social security numbers, birth dates, and addresses. The mishandling of the breach by Equifax was met with significant criticism and backlash. However, the company did undertake certain affirmative measures to engage with its customers and stakeholders via social media. Equifax established a specialized website and a Twitter account to furnish updates and details regarding the security breach. Additionally, they extended complimentary credit monitoring and identity theft protection amenities to the impacted customers. It is recommended to exercise caution when sharing the content of a sensitive or inappropriate nature on social media platforms, as such actions may lead to increased controversy.

The notion of positivity is vital. During a brand crisis, it is imperative to convey a positive message and emotional reactions to establish confidence and loyalty among customers. Target suffered a data breach that compromised the payment card information of 40 million customers and the personal information of 70 million customers (Srinivasan, Paine and Goyal, 2016). Target responded positively and transparently, informing its customers and the public about the breach, offering free credit monitoring and identity theft protection services to the affected customers, and providing a dedicated website and hotline for inquiries. Target also apologized sincerely and expressed its gratitude for its customers' loyalty. It is recommended to abstain from disseminating material that is pessimistic or incendiary, as this action may exacerbate any pre-existing brand predicament.

6.2 Draft social media strategy

Following a comprehensive analysis, comparison, and discourse of the social media strategy designs of two companies, this report proposes a social media strategy for Medibank.

During periods of crisis, it is crucial for Medibank to possess a clearly defined social media plan that facilitates proficient and productive correspondence with its customer base.

The aim of this assignment is to formulate a crisis policy for social media that outlines the steps a corporation will take to handle a crisis on social media and the responsible parties for its administration. By adopting this approach, the organization can promptly and efficiently address any emergency, thus preventing its escalation.

During a crisis, it is crucial to halt all promotional activities and pre-planned social media updates to allow Medibank to focus on addressing the issue at hand. Promptly enhance customer engagement by establishing a novel customer support unit to proactively address customer enquiries and concerns, comprehend customer requirements, elicit feedback, and leverage the feedback obtained to resolve issues in a focused manner.

After conducting a thorough evaluation of the matter, Medibank ought to devise a prompt and appropriate reaction that effectively caters to the apprehensions of its target demographic. This includes developing a personalized content strategy tailored to specific types of customers. For example, for young customer groups, content related to technology and health can be published, while for older customers, content related to body care and leisure health activities can be published.

Maintaining the release of progress reports regarding the handling of safety and other issues should be done continuously. For instance, what kinds of safety precautions have been taken, which relevant businesses have been partnered with to realize objectives for the protection of security and privacy, and which corporations have been subjected to official and authoritative oversight?

7. Conclusion

The social media audit report has scrutinized the present social media approaches of Medibank and Optus, with a particular emphasis on their Twitter customer engagement, culminating in this conclusion. The study involved a comprehensive evaluation of customer engagement on Twitter, which encompassed an examination of the emotional tone expressed in customers' tweets, as well as a social network analysis that utilized NodeXL. The analysis results were utilized to conduct a comparative evaluation of the social media strategies employed by the two companies. The report put forth three design considerations for a novel social media strategy for Medibank, and subsequently formulated a new social media strategy by assessing the performance of both companies in conjunction with the design considerations. The proposed social media strategy seeks to augment customer engagement, amplify brand recognition, and cultivate a favourable brand perception for Medibank. In summary, the report offers insights and suggestions to enhance Medibank's social media visibility and attain its corporate goals.

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<[https://twitter.com/search?q=customer%20service%20\(from%3AOptus\)&src=typed_query&f=live](https://twitter.com/search?q=customer%20service%20(from%3AOptus)&src=typed_query&f=live)>.

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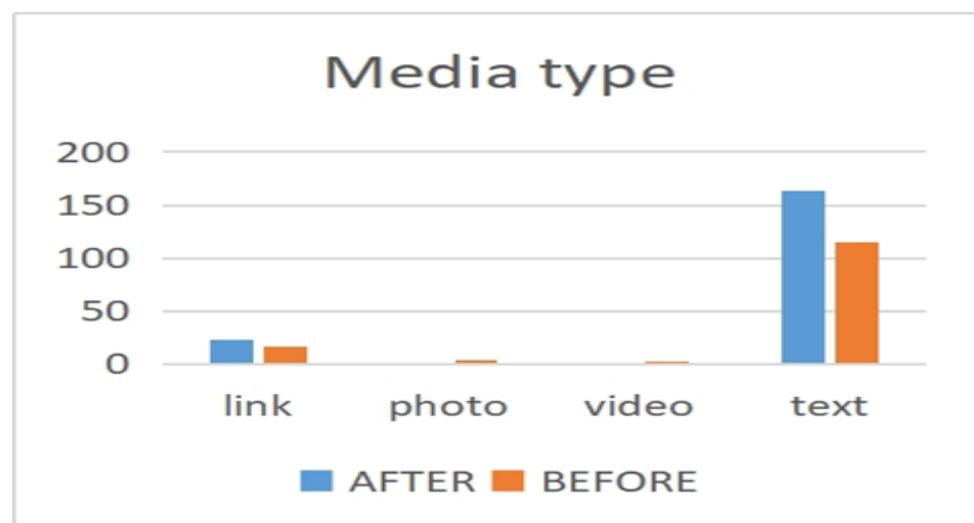
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Appendix

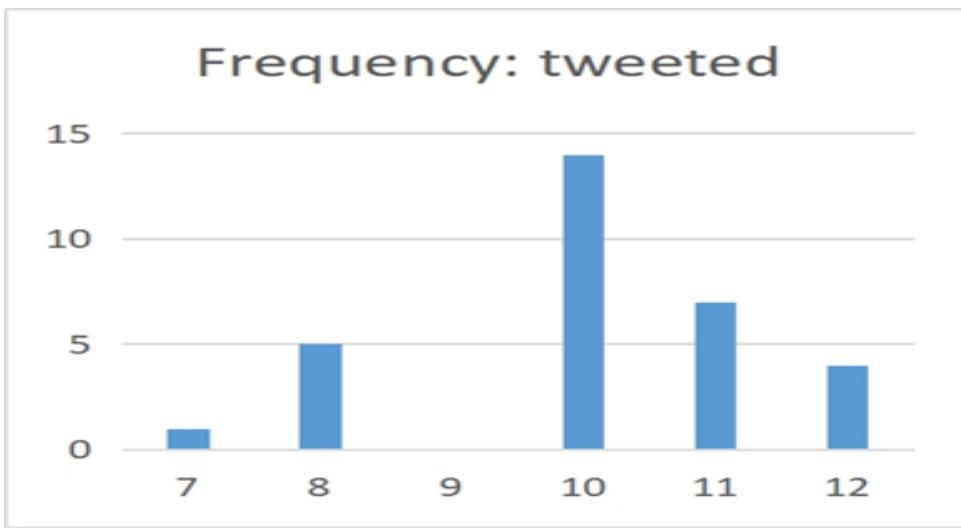
1. Excel data explanation

The following screenshots are data analysis from the given excel document. Firstly, PivotTables were used to compose the required data after using the filter. The resulting graph looks like the screenshot below. And The steps for Optus are the same as Medibank.

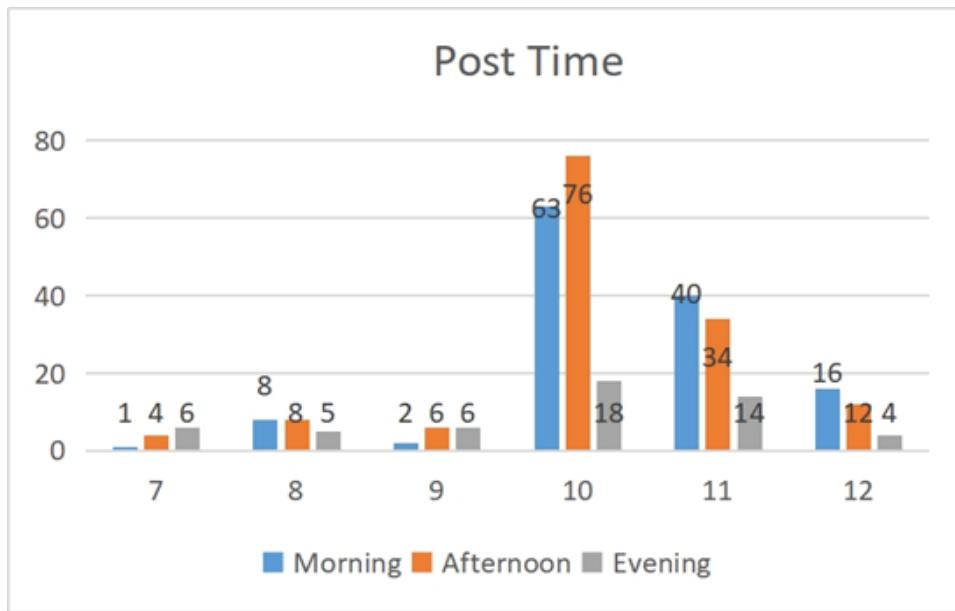
1.1 Media type for Medibank



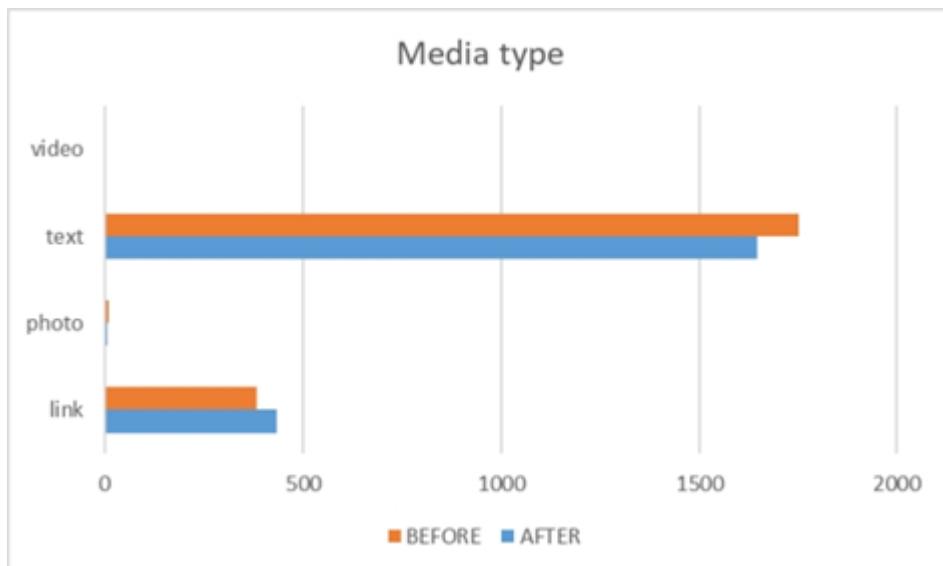
1.2 Frequency for Medibank



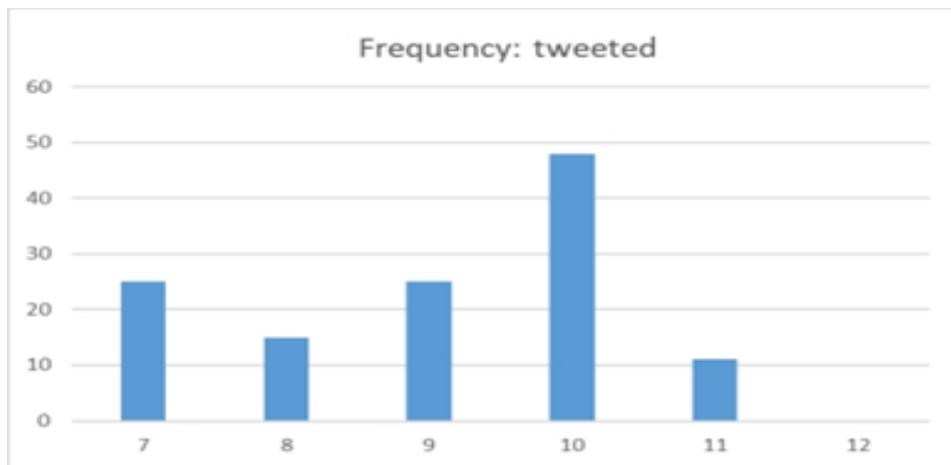
1.3 Post time for Medibank



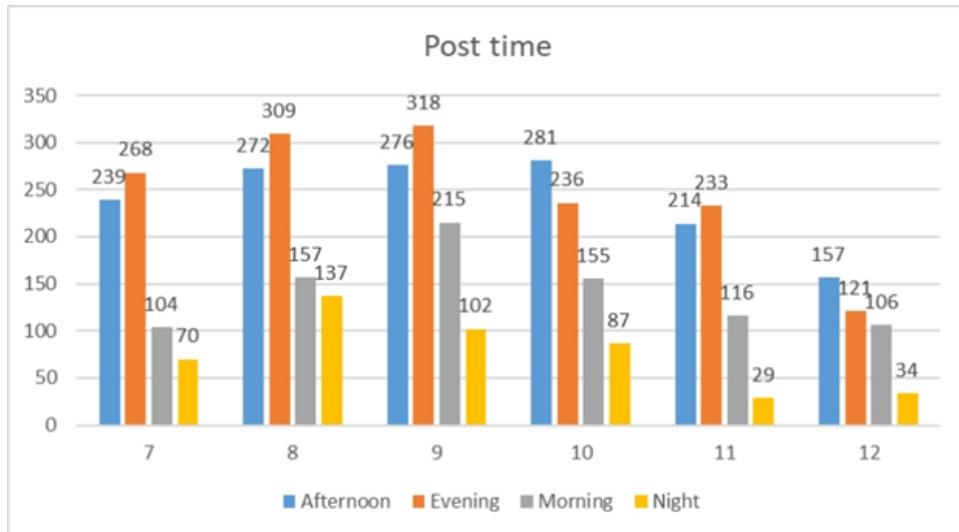
1.4 Media type for Optus



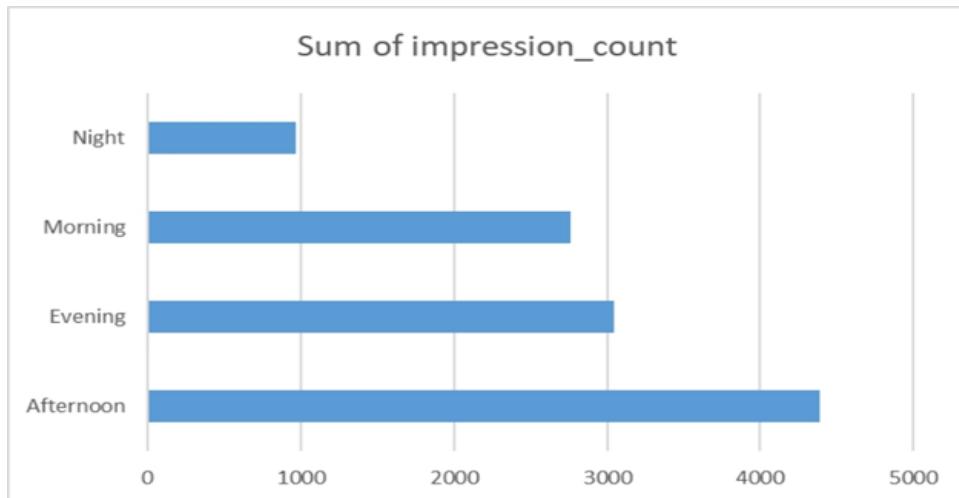
1.5 Frequency for Optus



1.6 Post time for Optus



1.7 Sum of impression for Optus



2. R code

2.1 Clean Text

sentiment analysis.R* Medibank_Tweets Optus_Tweets keyword analysis.R*

```

1 library(readxl)
2 library(dplyr)
3 library(stringr)
4 library(wordcloud)
5 library(snowballC)
6 library(tidyverse)
7 library(ggplot2)
8
9
10 #!
11 #Optus_Brand_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Brand_Tweets_Optus.xlsx")
12 #Medibank_Brand_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Brand_Tweets_Medibank.xlsx")
13 #Optus_Customer_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Customer_engagement_data-20230402/Customer_Tweets_Optus.xlsx")
14 #Medibank_Customer_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Customer_engagement_data-20230402/Customer_Tweets_Medibank.xlsx")
15
16 #!
17 #clean -> function(x){
18   x<-tolower(x)
19   x<-gsub("http://[[:blank:]]+", "", x)
20   x<-gsub("\\\\n", "", x)
21   x<-gsub("[[:blank:]]+", "", x)
22   x<-gsub("[[:alpha:]][[:punct:]][[:space:]]", "", x)
23   return(x)
24 }
25
26 Optus_Brand_data$clean_text<-clean_text(Optus_Brand_data$text)
27 Medibank_Brand_data$clean_text<-clean_text(Medibank_Brand_data$text)
28 Optus_Customer_data$clean_text<-clean_text(Optus_Customer_data$text)
29 Medibank_Customer_data$clean_text<-clean_text(Medibank_Customer_data$text)
30
31

```

(Top Level) R Script Environment History Connections Tutorial

Data

- unitedstates_data 173135 obs. of 24 variables
- Medibank_Brand_data 323 obs. of 16 variables
- Medibank_Customer_data 6952 obs. of 3 variables
- Medibank_Tweets 6952 obs. of 3 variables
- nouns 42187 obs. of 14 variables
- nouns_frequency 5161 obs. of 3 variables
- Optus_Brand_data 4236 obs. of 16 variables
- Optus_Customer_data 3873 obs. of 16 variables
- Optus_Hashtags 3873 obs. of 3 variables
- sentiment 6952 obs. of 14 variables
- subdol_english List of 2

Values

- sentimentPolarity Factor w/ 3 levels "negative","neutral",...: 1 2 3 1 3 NA 2 2 3

Functions

- clean_text function (<--)

Files Plots Packages Help Viewer Presentation

R 4.2.2

```

1 library(wordcloud)
2 library(snowballC)
3 library(tidyverse)
4 library(ggplot2)
5
6 Optus_Brand_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Brand_Tweets_Optus.xlsx")
7 Medibank_Brand_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Brand_Tweets_Medibank.xlsx")
8 Optus_Customer_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Customer_engagement_data-20230402/Customer_Tweets_Optus.xlsx")
9 Medibank_Customer_data<-read_excel("~/Desktop/IMFS5730 Assignment2/Customer_engagement_data-20230402/Customer_Tweets_Medibank.xlsx")

```

#!
#clean -> function(x){
x<-tolower(x)
x<-gsub("http://[[:blank:]]+", "", x)
x<-gsub("\\\\n", "", x)
x<-gsub("[[:blank:]]+", "", x)
x<-gsub("[[:alpha:]][[:punct:]][[:space:]]", "", x)
return(x)
#}
#Optus_Brand_data\$clean_text<-clean_text(Optus_Brand_data\$text)
#Medibank_Brand_data\$clean_text<-clean_text(Medibank_Brand_data\$text)
#Optus_Customer_data\$clean_text<-clean_text(Optus_Customer_data\$text)
#Medibank_Customer_data\$clean_text<-clean_text(Medibank_Customer_data\$text)

Medibank_Brand_data

	retweet_count	reply_count	like_count	quote_count	impression_count	media_type	cleantext
0	0	48	NA				hello, if you could please send me a dm ~ i'd appreciate the opportunity to look into this for you. - cath
1	0	55	NA				hello - thanks for your message. yes, a small number of people received an email from us yesterday that had a different name in the greeting. so we are returning an additional \$ million cash back to customers as part of our promise not to profit from covid- claims savings. this brings our total, we're also available via dm if you require any assistance. - cath
4	0	1045	link				hi there, thank you for reaching out to us. we do apologise for the long wait times as of late. due to high traffic demands, it is causing delays on our system. we understand your concerns, we are already working hard on introducing multi-factor authentication to our app. as soon as those changes have been implemented, we will be able to assist you further? thanks! - cath
0	0	57	NA				hi cameron, i've sent you a direct message regarding this. - grace
0	0	57	NA				we understand your concerns, we are already working hard on introducing multi-factor authentication to our app. as soon as those changes have been implemented, we will be able to assist you further? thanks! - cath
0	0	51	NA				hi there, thank you for reaching out to us. we do apologise for the long wait times as of late. due to high traffic demands, it is causing delays on our system. we understand your concerns, we are already working hard on introducing multi-factor authentication to our app. as soon as those changes have been implemented, we will be able to assist you further? thanks! - cath
0	0	59	NA				hi aditya, sorry to read that you're having difficulties contacting us. if you could please send us a private message regarding the details of your enquiry, we will be able to assist you further. - cath
0	0	0	NA				hi craig, thank you for your message. i am very sorry to hear about your experience. for assistance with your policy please send through a dm. - k
0	0	0	NA				good morning sonia, i am sorry to hear that you have had difficulties contacting us. please send through a dm if you require further assistance. - k
3	0	0	link				we can confirm that our systems are back up and running, following the successful completion of an it operation starting friday evening. customer support
0	0	0	link				we expect the systems will be back online sunday december at the latest. read more here.
2	1	0	NA				medibank and ahm systems, including contact centre, retail stores, apps and mhcaps, will be temporarily offline from pm (aedt) on friday decemb
0	0	0	NA				hi there, i'm sorry to read you haven't yet heard an outcome to your claim. could you please reach out to us via dm and we can look into this for you.
0	0	0	NA				hi stephanie, we'd like to take a look at this claim and your claims record with you. can you please send us a dm and we'll go from there? - grace
0	0	0	NA				hi there, as part of our customer support package, we are offering free identity monitoring services for customers who have had their primary id

2.2 Wordcloud

2.3 Sentiment

```
# 3. sentiment
sentiment = analyzeSentiment(Opthus_Customer_data$cleantext)
sentimentPolarity = convertToDirection(sentiment$SentimentQAP)
Opthus_Tweets = data.frame(Date = Opthus_Customer_data$created_at, tweets=Opthus_Customer_data$cleantext, sentiment = sentimentPolarity)

sentiment = analyzeSentiment(Medibank_Customer_data$cleantext)
sentimentPolarity = convertToDirection(sentiment$SentimentQAP)
Medibank_Tweets = data.frame(Date = Medibank_Customer_data$created_at, tweets=Medibank_Customer_data$cleantext, sentiment = sentimentPolarity)
```

sentiment analysis.R*			
Medibank_Tweets			
Optus_Tweets			
Filter	Date	tweets	sentiment
1	2022-12-31T23:43:20.000Z	yeah, but you still got hacked	negative
2	2022-12-30T15:24:29.000Z	russian hackers hiding behind god knows how ma...	neutral
3	2022-12-29T23:19:21.000Z	prime minister albanese australia help new years a...	positive
4	2022-12-29T22:36:29.000Z	how do we arrest unknown overseas perpetrators?	negative
5	2022-12-29T22:00:37.000Z	arrests? oh, you must be referring to the russian g...	positive
6	2022-12-29T01:18:59.000Z		NA
7	2022-12-26T16:10:29.000Z	tf? just got this email from #facebook saying someo...	neutral
8	2022-12-26T16:07:27.000Z	tf? just got this email from #facebook saying someon...	neutral
9	2022-12-25T12:43:18.000Z	#alliwantforchristmas is my boobs approved so i can ...	positive
10	2022-12-25T03:53:13.000Z	rt this is unacceptable, i just provided my details for...	positive
11	2022-12-24T20:54:39.000Z	this. more and more centralised security "experts" / ...	positive
12	2022-12-24T06:49:12.000Z	i took out travel insurance from #ahntravelinsurance ...	negative
13	2022-12-24T06:18:15.000Z	. and hacks spark warning over identity theft risks fr...	negative
14	2022-12-24T02:52:32.000Z	more australians are learning their personal informati...	negative
15	2022-12-24T00:58:38.000Z	omg! this!!! so hecking frustrating! #whatsintegrati...	negative
16	2022-12-23T23:51:13.000Z	that's the worst.	negative
17	2022-12-23T22:55:20.000Z	rt it's ironic that it's easier for hackers to access my ...	positive
18	2022-12-23T22:07:35.000Z	rt it's ironic that it's easier for hackers to access my ...	positive
19	2022-12-23T21:57:47.000Z	probably the same with mygov. i tried to link centre...	positive



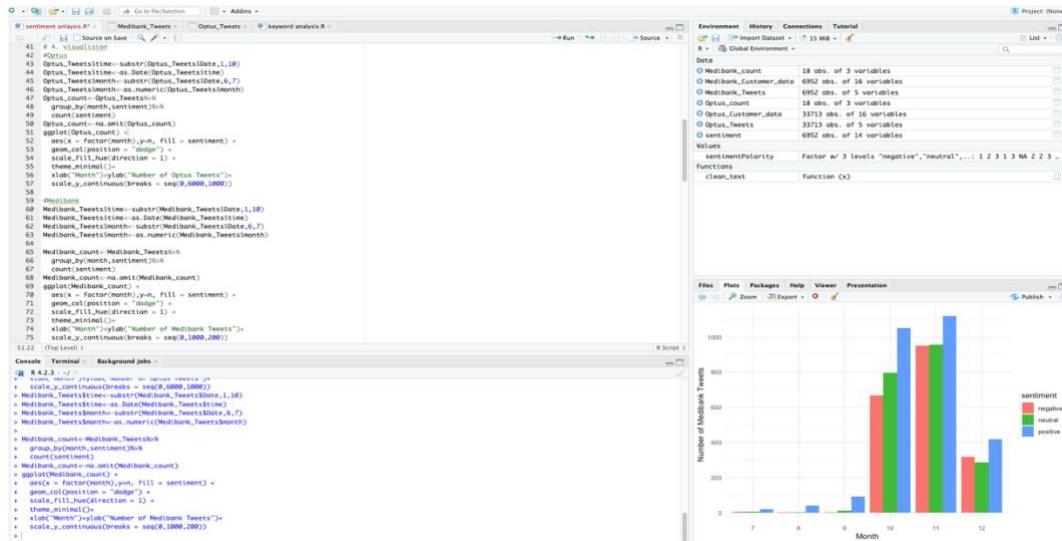
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SYDNEY

Screenshot of RStudio showing a data frame titled "sentiment analysis.R" containing 24 rows of tweet data. The columns are "Date", "tweets", and "sentiment".

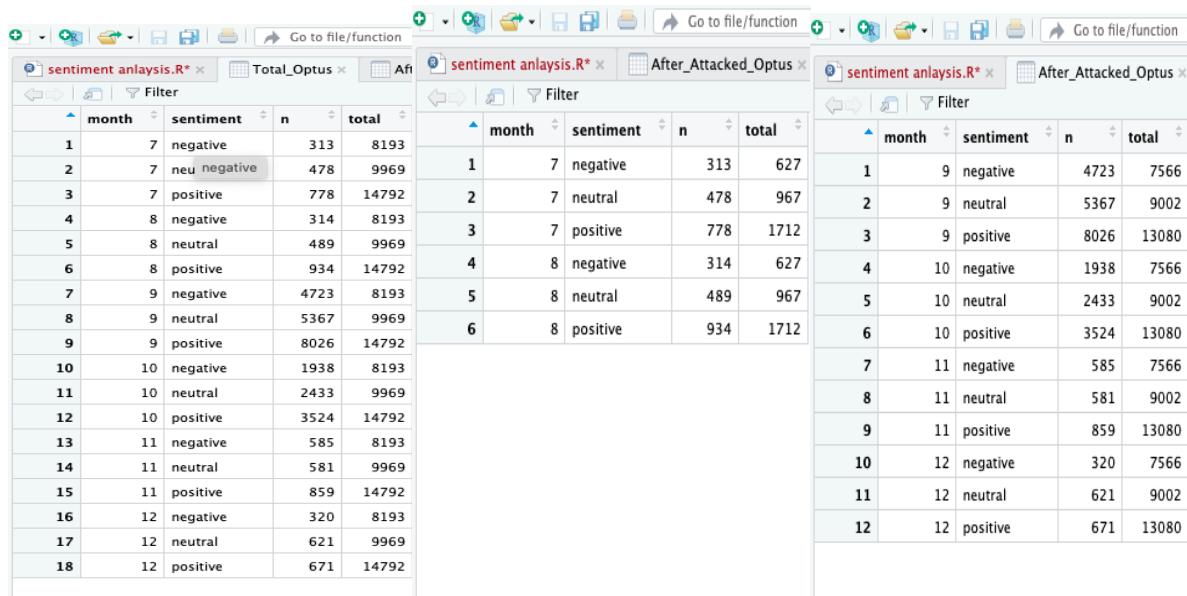
	Date	tweets	sentiment
1	2022-12-31T16:19:11.000Z		NA
2	2022-12-31T11:41:08.000Z	hi aman, this has been a constant problem for me si...	negative
3	2022-12-31T11:28:49.000Z	they need to harry up with ftp !!!!!!!!!!!!!!!	negative
4	2022-12-31T10:20:31.000Z	hey i can't message you because myaccount says i ne...	negative
5	2022-12-31T09:13:08.000Z	impossible to grab delay as comes up black but this ...	negative
6	2022-12-31T07:45:08.000Z	rt hey i just tried to use my free cyber attack protect...	positive
7	2022-12-31T07:43:24.000Z	rt done, complaints made to tio and accc ✓	negative
8	2022-12-31T07:40:22.000Z	rt optus helpdesk is issuing fake case numbers to g...	negative
9	2022-12-31T07:39:56.000Z	rt time to compensate the ex-customers whose data...	neutral
10	2022-12-31T07:39:41.000Z	rt	NA
11	2022-12-31T07:38:44.000Z	rt a customer for over years, had my details hacked ...	negative
12	2022-12-31T06:38:47.000Z	rt joined the loyalty program today. the recent data ...	negative
13	2022-12-31T05:02:06.000Z	can't even play p movie	positive
14	2022-12-31T03:10:48.000Z	since tuesday.	neutral
15	2022-12-31T03:08:05.000Z	just another generic response. have check. since pm ...	positive
16	2022-12-31T02:55:59.000Z	#massivefail mins online to offshore tech to no avail...	neutral
17	2022-12-31T02:39:19.000Z	what the hell is wrong with the nbn basically been wi...	negative
18	2022-12-31T02:21:03.000Z	the letter is appalling from lourish del rosario. "logg i...	negative
19	2022-12-31T02:15:26.000Z	you really want to help, so why send me an email wit...	positive
20	2022-12-31T01:57:14.000Z	was at my local store in booragoon to sort out my m...	positive
21	2022-12-31T01:34:24.000Z	rt is the year of minimum #telecommunications perf...	positive
22	2022-12-31T00:51:18.000Z	maybe i spoke a lil bit too soon. this time it seems th...	positive
23	2022-12-31T00:49:30.000Z	train your staff to stop lying and don't make promise...	positive
24	2022-12-31T00:23:24.000Z	is the year of minimum #telecommunications perfor...	positive

2.4 Visualization

2.4.2 Overview



2.4.2 Calculated percentage



sentiment analysis.R

```

86 # 5. percentage
87 Total_Optus<-Optus_count[Optus_count$month==7|Optus_count$month==12,]
88 Total_Attacked_Optus<-
89 group_by(sentiment)$cols<-
90 mutate(total=sum(n))%>%
91 ungroup()
92 number = c(14792, 4193, 9999)
93 types = c("positive", "negative", "neutral")
94 Optus_percent<-Optus_count[,c(1,2,3,4,5,6,7,8)]%>%
95 colSums() %>% round(.number / sum(number) * 100, 1), "K")
96 cols = c("red", "green", "grey")
97 pie(number, labels=Optus_percent, main = "Total Optus", col=cols)
98 legend("topright", types, cex=0.6, fill=cols)
99 Before_Attacked_Optus<-Optus_count[Optus_count$month==7|Optus_count$month==8,]
100 Before_Attacked_Optus<-Before_Attacked_Optus%<-
101 group_by(sentiment)$cols<-
102 mutate(total=sum(n))%>%
103 ungroup()
104 number = c(1712, 627, 967)
105 types = c("positive", "negative", "neutral")
106 Optus_percent<-Optus_count[,c(1,2,3,4,5,6,7,8)]%>%
107 colSums() %>% round(.number / sum(number) * 100, 1), "K")
108 cols = c("red", "green", "grey")
109 pie(number, labels=Optus_percent, main = "Before Attacked Optus", col=cols)
110 legend("topright", types, cex=0.6, fill=cols)
111 After_Attacked_Optus<-Optus_count[Optus_count$month==8|Optus_count$month==12,]
112 After_Attacked_Optus<-After_Attacked_Optus%<-
113 group_by(sentiment)$cols<-
114 mutate(total=sum(n))%>%
115 ungroup()
116 number = c(13880, 7566, 9002)
117 types = c("positive", "negative", "neutral")
118 Optus_percent<-Optus_count[,c(1,2,3,4,5,6,7,8)]%>%
119 colSums() %>% round(.number / sum(number) * 100, 1), "K")
120 pie(number, labels=Optus_percent, main = "After Attacked Optus", col=cols)
121 legend("topright", types, cex=0.6, fill=cols)
122 
```

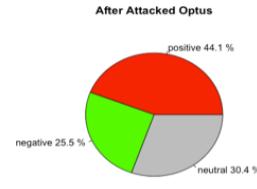
(Top Level) :

Console Terminal : Background Jobs :

```

R 4.2.3 - -r--w--w-.:
> types = c("positive", "negative", "neutral")
> Optus_percent = paste(types,round(number / sum(number) * 100, 1), "K")
> cols = c("red", "green", "grey")
> pie(number, labels=Optus_percent, main = "Total Optus", col=cols)
> legend("topright", types, cex=0.6, fill=cols)
> After_Attacked_Optus<-Optus_count[Optus_count$month==7|Optus_count$month==12,]
> group_by(sentiment)$cols<-
> mutate(total=sum(n))%>%
> ungroup()
> number = c(13880, 7566, 9002)
> types = c("positive", "negative", "neutral")
> Optus_percent<-Optus_count[,c(1,2,3,4,5,6,7,8)]%>%
> colSums() %>% round(.number / sum(number) * 100, 1), "K")
> cols = c("red", "green", "grey")
> pie(number, labels=Optus_percent, main = "Before Attacked Optus", col=cols)
> legend("topright", types, cex=0.6, fill=cols)
> After_Attacked_Optus<-Optus_count[Optus_count$month==8|Optus_count$month==12,]
> group_by(sentiment)$cols<-
> mutate(total=sum(n))%>%
> ungroup()
> number = c(1712, 627, 967)
> types = c("positive", "negative", "neutral")
> Optus_percent<-Optus_count[,c(1,2,3,4,5,6,7,8)]%>%
> colSums() %>% round(.number / sum(number) * 100, 1), "K")
> cols = c("red", "green", "grey")
> pie(number, labels=Optus_percent, main = "After Attacked Optus", col=cols)
> legend("topright", types, cex=0.6, fill=cols)
> 
```

86:17 (Top Level) :



sentiment analysis.R

```

123 Total_Medibank<-Medibank_count[Medibank_count$month==7|Medibank_count$month==12,]
124 Total_Medibank<-Total_Medibank%<-
125 group_by(sentiment)$cols<-
126 mutate(total=sum(n))%>%
127 ungroup()
128 number = c(1745, 1955, 2063)
129 types = c("positive", "negative", "neutral")
130 Medibank_percent<-Medibank_count[,c(1,2,3,4,5,6,7,8)]%>%
131 colSums() %>% round(.number / sum(number) * 100, 1), "K")
132 cols = c("red", "green", "grey")
133 pie(number, labels=Medibank_percent, main = "Total Medibank", col=cols)
134 legend("topright", types, cex=0.6, fill=cols)
135 Before_Attacked_Medibank<-Medibank_count[Medibank_count$month==7|Medibank_count$month==9,]
136 Before_Attacked_Medibank<-Before_Attacked_Medibank%<-
137 group_by(sentiment)$cols<-
138 mutate(total=sum(n))%>%
139 ungroup()
140 number = c(1589, 1938, 2042)
141 types = c("positive", "negative", "neutral")
142 Medibank_percent<-Medibank_count[,c(1,2,3,4,5,6,7,8)]%>%
143 colSums() %>% round(.number / sum(number) * 100, 1), "K")
144 cols = c("red", "green", "grey")
145 pie(number, labels=Medibank_percent, main = "Before Attacked Medibank", col=cols)
146 legend("topright", types, cex=0.6, fill=cols)
147 After_Attacked_Medibank<-Medibank_count[Medibank_count$month==8|Medibank_count$month==12,]
148 After_Attacked_Medibank<-After_Attacked_Medibank%<-
149 group_by(sentiment)$cols<-
150 mutate(total=sum(n))%>%
151 ungroup()
152 number = c(1589, 1938, 2042)
153 types = c("positive", "negative", "neutral")
154 Medibank_percent<-Medibank_count[,c(1,2,3,4,5,6,7,8)]%>%
155 colSums() %>% round(.number / sum(number) * 100, 1), "K")
156 cols = c("red", "green", "grey")
157 pie(number, labels=Medibank_percent, main = "After Attacked Medibank", col=cols)
158 legend("topright", types, cex=0.6, fill=cols)
159 
```

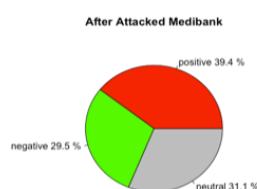
(Top Level) :

Console Terminal : Background Jobs :

```

R 4.2.3 - -r--w--w-.:
> types = c("positive", "negative", "neutral")
> Medibank_percent = paste(types,round(number / sumNumber) * 100, 1), "K"
> cols = c("red", "green", "grey")
> pie(number, labels=Medibank_percent, main = "Before Attacked Medibank", col=cols)
> legend("topright", types, cex=0.6, fill=cols)
> After_Attacked_Medibank<-Medibank_count[Medibank_count$month==8|Medibank_count$month==12,]
> group_by(sentiment)$cols<-
> mutate(total=sum(n))%>%
> ungroup()
> number = c(1589, 1938, 2042)
> types = c("positive", "negative", "neutral")
> Medibank_percent<-Medibank_count[,c(1,2,3,4,5,6,7,8)]%>%
> colSums() %>% round(.number / sumNumber) * 100, 1), "K"
> cols = c("red", "green", "grey")
> pie(number, labels=Medibank_percent, main = "After Attacked Medibank", col=cols)
> legend("topright", types, cex=0.6, fill=cols)
> 
```

123:17 (Top Level) :



3. NodeXL screenshot

3.1. Excel data before clean:

A1	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Id	created_at	author_id	in_reply_to_user_id	type	referenced_tweet_id	conversation_id	lang	twt	retweeted_count	reply_count	like_count	quote_count	impression_count	media_type	
1	209933418908545024	2022-12-31T23:43:20.000Z	103730345824534529	35733635					0	0	0	0	0	53	
2	16088449218550852	2022-12-30T15:24:29.000Z	20962944	22573600	replied_to	1605713153093820417	1605713153093820417	en	@medibank	0	0	0	0	0	16
3	160806361040923036	2022-12-29T23:19:21.000Z	159882483279476032	22573600	replied_to	160852528843288577	160852528843288577	en	@QuentinI	0	0	0	0	0	3 video
4	160859282063068162	2022-12-29T22:36:29.000Z	20101887121463287808	22573600	replied_to	160852528843288577	160852528843288577	en	@QuentinI	0	0	0	0	0	37
5	1608583796707841	2022-12-29T22:00:37.000Z	159684676717539328	22573600	replied_to	160852528843288577	160852528843288577	en	@QuentinI	0	0	0	0	0	19
6	1608711328381108235	2022-12-29T01:18:59.000Z	1582519855281864704	153537378	replied_to	1606049498144219136	1606049498144219136	en	@M@AliceBr	0	0	0	0	0	3 photo
7	160740851740384236	2022-12-26T16:10:29.000Z	997073821	18629828	retweeted_to	1585792213635977217	1585792213635977217	en	@Jeremy_k	0	0	0	0	0	119 photo
8	1607407753743728641	2022-12-26T16:07:27.000Z	997073821		retweeted_to	1607407753743728641	1607407753743728641	en	@TfJustGet	0	0	0	0	0	34 link
9	1606993991651954688	2022-12-25T12:43:18.000Z	118017249	357336335	retweeted_to	1606993991651954688	1606993991651954688	en	@medibank	0	0	0	0	0	77
10	16068605808665761	2022-12-25T03:53:13.000Z	1248990618543521793		retweeted_to	16068605808665761	16068605808665761	en	@RT@krnsA	1	0	0	0	0	0
11	160673525433558211	2022-12-24T20:54:39.000Z	294219032		retweeted_to	160673525433558211	160673525433558211	en	This_isLast	0	0	0	0	0	91

Medibank



UNSW
SYDNEY

A1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	id	created_at	author_id	in_reply_to_user_id	type	referenced_tweet_id	conversation_id	lang	text	retweet_count	reply_count	like_count	quote_count	impression_count	media_type
2	1609922646264377351	2022-12-31T16:19:11.000Z	446021698	48201591	replied_to	1609054209873416193	1609052254967070721	qmc	@Optus ht	0	0	0	0	0	7 photo
3	160915267415668737	2022-12-31T11:41:08.000Z	22340712	48201591	replied_to	160911873765017472	160905961342910465	en	@Optus Hi	0	1	0	0	0	39
4	1609149572311568386	2022-12-31T11:28:49.000Z	152338080	732492601	replied_to	1608982114279776257	1608982114279776257	en	@_markagi	0	0	0	0	0	33
5	160911868607854388	2022-12-31T09:13:08.000Z	223407008	48201591	retweeted	160911868607854388	160911868607854388	en	Hey @Opt	0	1	0	0	0	84
6	1609115425702567936	2022-12-31T09:13:08.000Z	22340712	48201591	replied_to	1609100270423937026	16090996121342910465	en	@Optus Im	0	2	0	0	0	103 photo
7	160909328773023858	2022-12-31T07:43:24.000Z	464276020	464276020	retweeted	160371322132123648	1608993282773023858	en	RT @Lenni	1	0	0	0	0	0
8	16090932844797909360	2022-12-31T07:43:24.000Z	464276020	464276020	retweeted	160371322132123648	16089932844797909360	en	RT @paulbi	1	0	0	0	0	0
9	1609092082085548039	2022-12-31T07:40:22.000Z	464276020	464276020	retweeted	1602183262453235717	16089092082085548039	en	RT @Goom	1	0	0	0	0	0
10	1609091972177997825	2022-12-31T07:39:56.000Z	464276020	464276020	retweeted	1595731537852788736	1609091972177997825	en	RT @AhhhK	1	0	0	0	0	0 photo
11	1609091911809400835	2022-12-31T07:39:41.000Z	464276020	464276020	retweeted	1594117457173962753	1609091911809400835	qmc	@AhhhK	1	0	0	0	0	0 photo

Optus

3.2. Excel data after clean:

C26	A	B	C	D	E	F
1	id	author_id	in_reply_to_user_id	type	referenced_tweet_id	referenced_tweet_author_id
7	1608271328381108225	1582519855281864704	1535537378	replied_to	1606049498144219136	1535537378
8	1607408517740384256	997073821	18629282	replied_to	1585792213635977217	18629282
10	1606454265752739840	460065690	721445478	replied_to	1606408754919919616	721445478
11	1606437300837429248	52954894	721445478	replied_to	1606408754919919616	721445478
12	1606408754919919616	721445478	52954894	replied_to	1606150073825787904	52954894
13	1606377134695796736	633307548	1535537378	replied_to	1606049498144219136	1535537378
14	1606156415143673856	52954894	123422786	replied_to	1606154660519194625	123422786
15	1606154660519194625	123422786	52954894	replied_to	1606150073825787904	52954894
16	1605926371653554176	2337834596	18629282	replied_to	1605736527019278337	18629282
17	1605835194262777856	18629282	1517343356392972288	replied_to	1605811491197685760	1517343356392972288
18	1605834005344968704	1435235543227502608	1435235543227502608	replied_to	1605832756998467584	1435235543227502608
19	1605811491197685760	1517343356392972288	18629282	replied_to	1605736527019278337	18629282

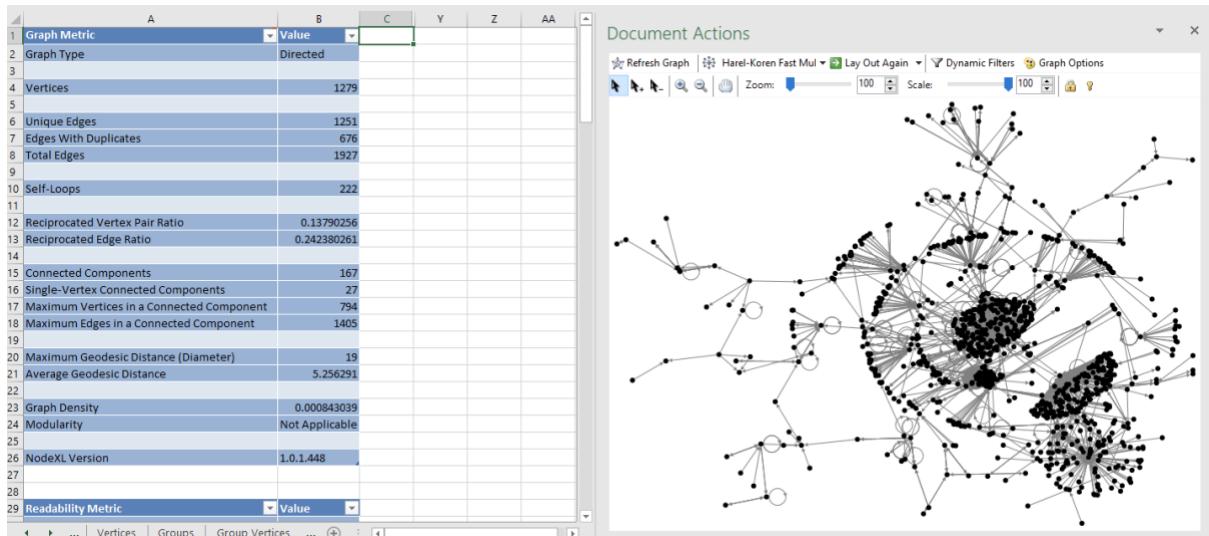
Medibank

A	B	C	D	E	F
1	id	author_id	in_reply_to_user_id	type	referenced_tweet_id
4	1609149572311568386	152331980	732492601	replied_to	1608982114279776257
27	1608373584652795909	1534477499962650626	2711608002	replied_to	1608372115400712194
28	1608372115400712194	2711608002	1534477499962650626	replied_to	1608361600649670659
29	1608371168649834498	2711608002	296448308	replied_to	1604982860506877954
30	1608361600649670659	1534477499962650626	296448308	replied_to	1604982860506877954
31	1608358338315837442	234226460	174807646	replied_to	1608350403762229251
32	1608356713274408961	1604239944972734465	1598597667600609280	replied_to	1608354705264250883
35	1608350403762229251	174807646	234226460	replied_to	1608337436253507586
36	1608342418730147840	170177932	170177932	replied_to	1605451921879203840
38	1608278801766813697	25664375	25664375	replied_to	1608278540965019648
40	1608273293651619840	1582519855281864704	1448772612897730560	replied_to	160583796000677888
41	1608273205944528896	1582519855281864704	313733784	replied_to	1605422548182671362

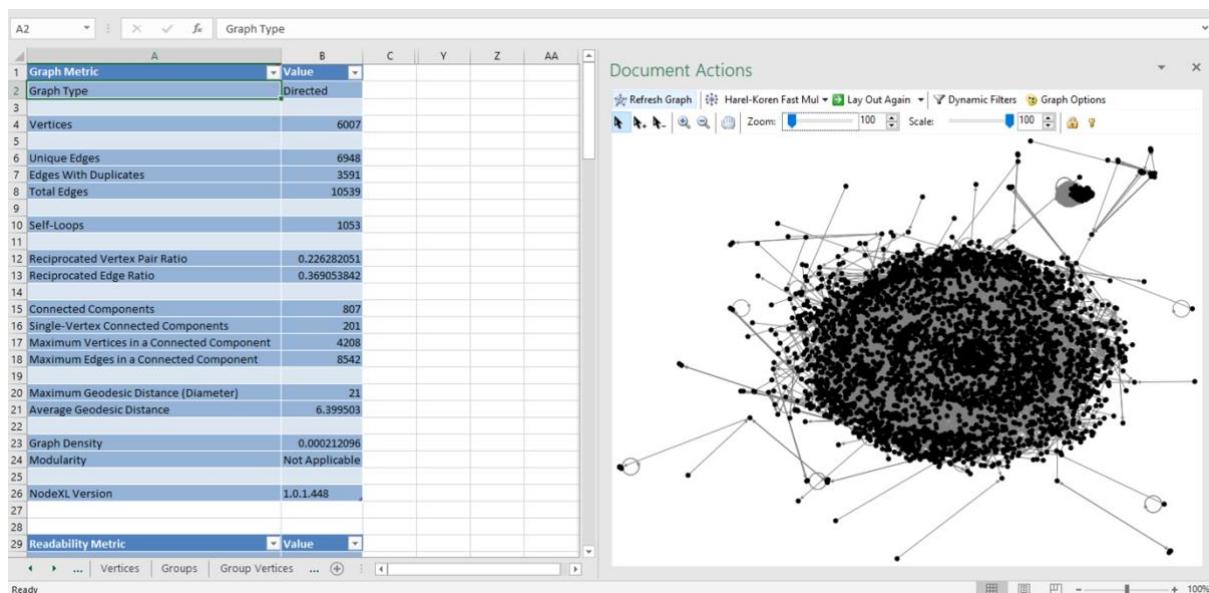
Optus

3.3. NodeXL Overview of Medibank:





3.4. NodeXL Overview of Optus:



4. Discussion

In a brand crisis, social media planning is crucial. The company does take some proactive steps to engage with customers and stakeholders through social media. Communicating the situation to the public in a timely manner, acknowledging any mistakes and proposing possible remedies can reduce the impact of the crisis. However, are these measures taken effective? Can you really understand customer requirements and get feedback? Can you save the brand reputation? Are there

potential complications that may arise over time? These problems are worthy of discussion and attention when the brand crisis.