

# Twitter sentiment analysis: The case of mobile network outage

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Christopher Hackett, Aleksej Heinze and Gordon Fletcher

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## INTRODUCTION

This study conducted by [FastWebMedia](#) and [Salford Business School](#) looks at how the sentiment of tweets for UK mobile phone operators changed during and after a business critical technology failure. In July 2012 O2 experienced an extensive mobile network outage affecting a significant proportion of customers (*The Guardian*, [www.guardian.co.uk/business/2012/oct/13/o2-mobile-service-outage](http://www.guardian.co.uk/business/2012/oct/13/o2-mobile-service-outage) - accessed on 13 November 2012).

## KEY FINDINGS

- Competitor analysis from the Twitter platform allows unique fast insight into the perceptions of a brand and its competitors.
- Vocal customers using Twitter is the generalised voice of customers. This is particularly the case in industries where high Twitter adoption is already evident - for example in mobile telecommunications.
- Organisations should not dismiss vocal complaints or frustrated customers as 'one offs' that are not representative of overall customer opinion.
- Both extreme and general views derived from tweets offer a reliable insight into prevailing customer opinion.
- Users directing tweets at a specific Twitter account will continue to express strong views for a longer period of time than those who are merely mentioning the brand. This can produce misleading perspectives on the overall public opinion about a brand after a significant event.
- The window of opportunity available for an organisation to formulate a response to negative events is small and should be measured in hours rather than days.
- The principle that "there is no such thing as bad publicity" can work positively for small scale incidents if they are managed well and recovered quickly.

## METHODOLOGY

We used the Twitter search API to retrieve tweets containing specific operator names over the previous 6 days. Taking into account market share and operators' official presence on Twitter we compared 4 mobile phone brands; O2, Orange, T-Mobile & Vodafone.

For each tweet we captured the visible text, the search term used and the date the tweet was sent. The API permits 1500 tweets to be retrieved per search request and no private tweets will be returned. A further consideration is that the data returned from the API is not guaranteed to be an exhaustive result list of the query but what Twitter algorithmically considers the most relevant.

We captured tweets based on 3 types of search terms or keywords:

**Direct** – Searches for results where the official UK Twitter account is mentioned by name (i.e. @OrangeUK)

**Brand** – Only the brand was used to search for tweets

**Brand with mobile** – The brand name and the word ‘mobile’ was searched for in tweets

Once retrieved each tweet was scored on a scale from -2 to 2 by the number of occurrences of positive and negative English words. These scores were then aggregated into two overall ratios which took into account all non-neutral tweets (general views) and only those which scored  $\geq 2$  or  $\leq -2$ . These latter scores represent extremely positive and extremely negative opinion respectively.

## KEY DATES

To have a useful interpretation of the data it is important to consider the timeline of events surrounding the incident.

11th July	(AM) Normal Service (PM) Issue begins
12th July	(AM) Issue is on-going (PM) Fully resolved
13th July	Normal Service - The official response from @o2 goes viral
14th July	Normal Service
15th July	Normal Service

## ANALYSIS

Before starting our investigation we first looked at the overall presence that O2 has through the Twitter network (Figure 1). The official UK account has by far the most followers of any UK mobile operator included in this study. We also observed that the day before the network incident, which represents an index of ‘normal’ activity, more Twitter users mention the account @o2 than other networks (Figure 2). From this we can infer that O2 has a significant presence and activity on Twitter.

Account	Followers	Tweets
@o2	116,088	97,185
@VodafoneUK	50,292	132,664
@TMobileUK	13,391	3,859
@OrangeUK	8,436	8,436

Figure 1: Official mobile network twitter accounts

## DATA - OFFICIAL TWITTER PRESENCE

On the first day of the outage - 11th July 2012 there was a significant increase in direct tweets with negative sentiment mentioning the o2 brand (Figure 2 second column and first row). For direct mentions to the @o2 account this negative sentiment is sustained for a further three days until after the 14th July. A more rapid decrease is observed in the negative mentions for the terms ‘o2’ and ‘o2 mobile’. Four days after the start of the incident the overall profile of o2 on the social network had returned to the levels previously observed before the incident (Figure 2 last column). Over the same period other mobile networks enjoyed a modest increase in positive mentions but this opportunity has dissipated after just 3 days of elevated activity. The

mirroring of increased activity among competing brands presents a range of possible explanation with the most likely being that customers of unaffected networks were seeking confirmation of their own continued service integrity as a response to popular media reporting of the O2 situation.

This suggests that the window of opportunity that is available to an organisation to respond to negative news and incidents is narrow. A circumstance that necessitates those with responsibility for the social media activities of an organisation to have both the tools to monitor their presence on social media platforms and the flexibility and authority to produce an appropriate response - including the potential option of producing no public statement.

There is a further observation that allies but follows the narrow window of opportunity presented to a brand. Comparing the neutral mentions of o2 before and after the incident to other competitors shows the overall number of neutral mentions for o2 has increased by nearly 100 mentions per day. At the same time - post-incident - the number of mentions for competitors has decreased. This suggests that the cliché, “there is no such thing as bad publicity” remains true at least for smaller scale incidents if these are managed and recovered quickly. Observations over this short period suggests that o2 benefited from the incident by ultimately gaining a greater volume of neutral voice at the conclusion of the incident period. Further confirmation of this observation will highlight the importance for brands to have incident recovery plans that include addressing online communities such as Twitter in order to build their ‘official’ presence.

Overall sentiment scores (Figure 3) shows that despite separating the overall brand scores into normal views (any non-neutral tweet sentiment score) and extreme only views (tweet sentiment score  $\geq 2$  or  $\leq -2$ ) these both typically follow the same overall trend. This indicates vocal users as reliable sources of insight into overall popular sentiment towards a brand. An attitude of dismissing complaints by the loudest angry or frustrated customers as ‘one offs’ may therefore ultimately prove to be counterproductive.

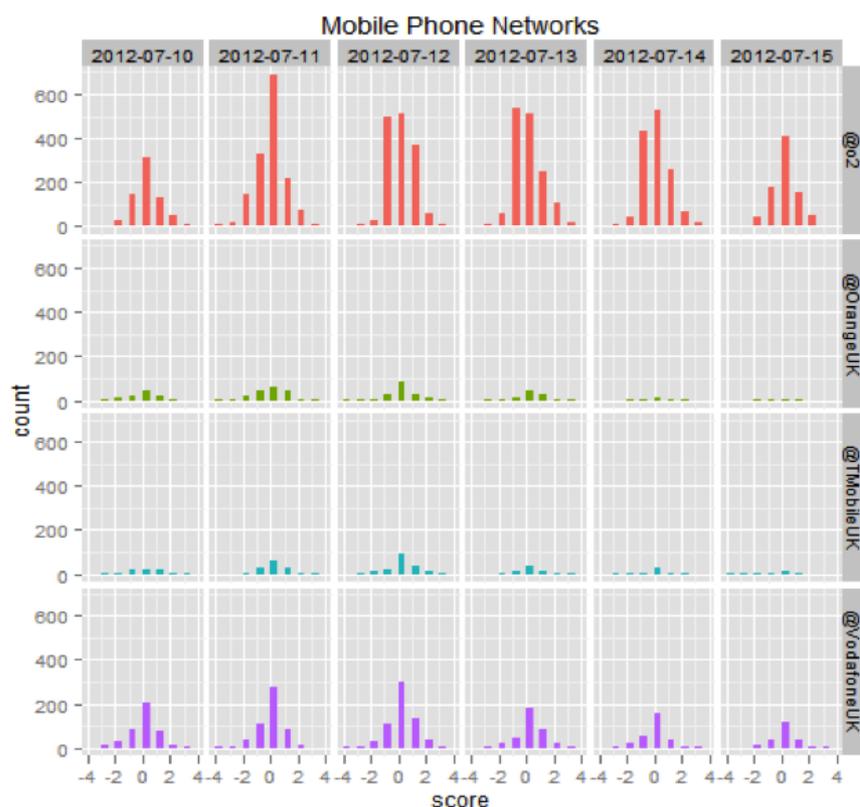


Figure 2: Daily aggregate sentiment scores for O2, Orange, T-Mobile and Vodafone; 0 represents comment

neutrality, -2 represents extremely negative and 2 represents extremely positive.

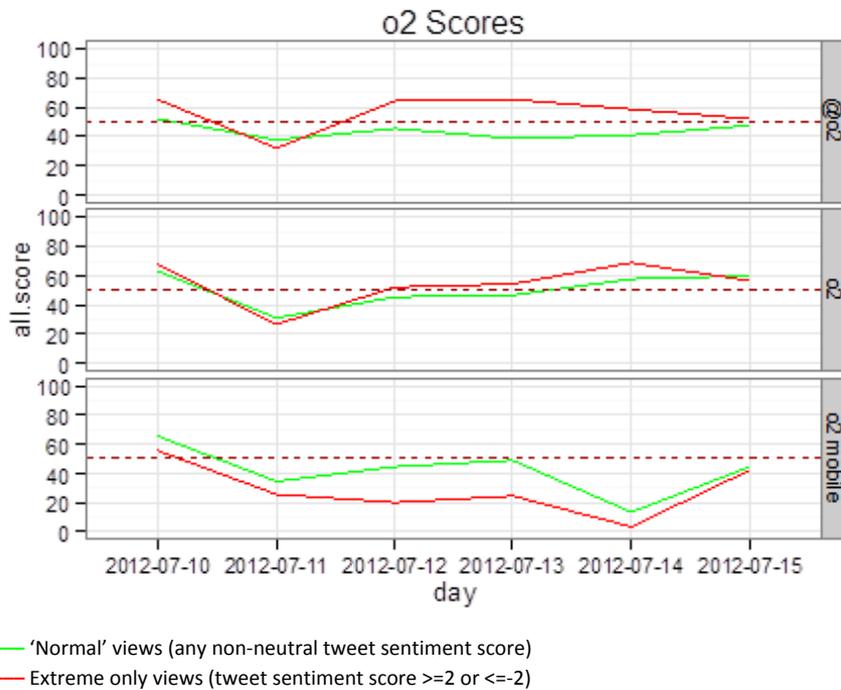


Figure 3: Extreme and 'normal' sentiment scores for O2

### NARROW VS BROAD SENTIMENT ANALYSIS

To this point we have focused on the main indicators that best demonstrate the shifting sentiments of a brand during a critical incident - in this case tweets directed to the official Twitter presence of each brand.

Examination and analysis of a wider range of related search terms proved to add only minor benefit to the analysis (Figure 4). The pattern of events that can be identified generally echo that offered by the brand itself. Only two differences between the official Twitter presence and keyword analysis can be identified. The volume of search is higher when examining the keywords but this use of keywords appears to introduce a range of other circumstances and noise to the analysis. For example, the volume and consistently high level of activity around TMobile and the high entry activity for Orange cannot be explained solely in the context of the O2 outage incident. These additional factors may well be significant for a sustained and longer term analysis and understanding of a brand but this itself precludes formulating an incident response. Broad keyword analysis in the 'brand + mobile' example also fails to reveal the comparative post-incident shift in the volume of neutral tweets to each brand.

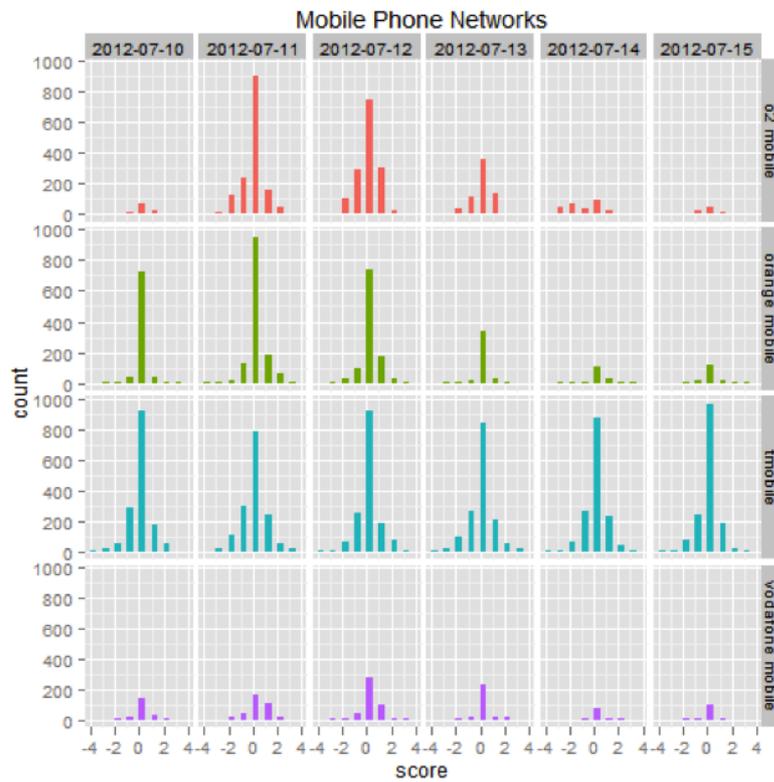


Figure 4: Data for six days for four brands searched by “brand + mobile” keyword

#### DATA (BRAND)

Figure 5 shows brand keywords and shows that overall there are smaller variations in sentiment compared to direct mentions. Nevertheless, we can identify a shift from negative/neutral to neutral/positive over 4 days. It is also worth noting that even networks that have fewer followers such as Orange and T-Mobile have approximately 1000 messages suggesting that each brand’s active online communities are almost equal in size.

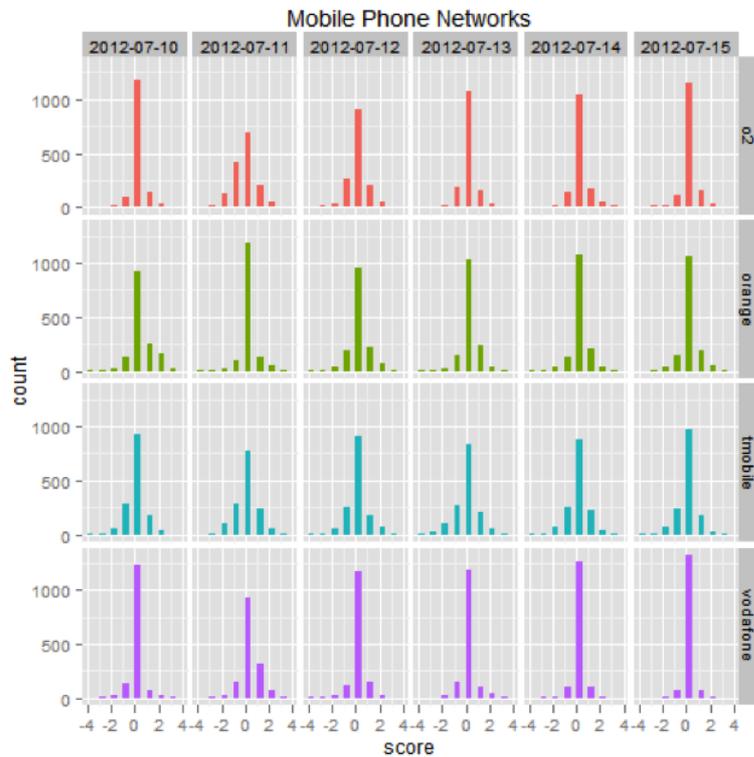


Figure 5: Data for six days for four brands based on “brand” keyword

## CONTACT INFORMATION

### FAST WEB MEDIA LTD

Joana Ferreira  
 Digital Marketing Executive  
 joana.ferreira@fastwebmedia.com  
 +44 (0) 845 07 39393

4<sup>th</sup> Floor Digital World Centre  
 Media City  
 Salford Quays  
 Manchester  
 M50 3UB

[www.fastwebmedia.com](http://www.fastwebmedia.com)



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