Understanding User Engagement with Entertainment Media: A Case Study of the Twitter Behaviour of Game of Thrones (GoT) Fans

Understanding User Engagement with Entertainment Media: A Case Study of the Twitter Behaviour of Game of Thrones (GoT) Fans

Alessia Antelmi
Dept. of Computer Science
University of Salerno
Fisciano, Italy
aless.antelmi@gmail.com

John Breslin
Insight Centre for Data Analytics
Data Science Institute
National University of Ireland
Galway, Ireland
john.breslin@nuigalway.ie

Karen Young
Insight Centre for Data Analytics
Data Science Institute
National University of Ireland
Galway, Ireland
karen.young@nuigalway.ie

***Abstract*—User Engagement in digital experiences is a fundamental concern for technology developers, educators, businesses, TV networks and marketing agencies. However, engagement remains a confusing concept with cognitive, emotional and behavioural dimensions, that depends on a large number of technical and human interrelated factors. This study contributes to our understanding of User Engagement at a behavioural level, through an analysis of a HBO Game of Thrones (GoT) fans' Twitter dataset, collected over a six-month period. This analysis across the GoT universe: literary, screen, and media extensions, found users are most engaged in discussions around the TV show, and predictably most particularly the season premiere and finale, on the day after it is aired using mobile devices to post their status updates. Additionally, an initial hashtag analysis reveals users are engaged in both user generated conversations and in corporate TV network campaigns, while initial semantic analysis of tweets reveals TV locations and GOT characters to be the most tweeted about topics. This characterisation of user behaviours presents opportunities to content developers to maximise and capitalise on this active social interaction in a timely manner, keeping the brand alive and also to mine this user feedback in real time to inform the development of forthcoming content.**

***Index Terms*—User Engagement, User Behaviour, Entertainment media, Transmedia, Game Of Thrones, HBO**

I. Introduction

The issue of User Engagement is a fundamental concern in all technological development and deployment efforts, across all application domains (marketing, education, health, games, and entertainment among others). In an increasingly complex and populated technological landscape, users are required to navigate a path through multiple technologies: devices, media, applications, interaction styles, networks, for multiple purposes on a daily basis. Economic, educational and even health benefits can all accrue from a better understanding of what users find truly engaging in a technological experience. However, engagement remains a confusing concept that encompasses several notions and depends on a large number of technical and human interrelated factors [1].

This paper has been funded in part by Science Foundation Ireland under grant number SFI/12/RC/2289 (Insight).

Studies of user engagement in games [2], and entertainment are frequent and have resulted in many different definitions of user engagement. All recognize the complex, multifaceted nature of engagement: "engagement is a multidimensional construct which is subject to a context-specific expression of relevant cognitive, emotional, and behavioural dimensions" [3]. Much research attention has been focused on the cognitive and psychological aspects of user engagement. In this study we focus on the behavioural dimension. Hollebeek [3] elaborates further that user engagement is generated as a result of a two-way communication process between subject (user) and object (product/brand). Through analysis of users' twitter activities, we thus aim to extend our understanding of user engagement at a behavioural level by examining dynamic user – product interactions on this social media platform.

Television has been an important sector of the entertainment industry since its invention and has, in recent years, undergone a paradigm shift from a single medium to a multi or transmedia context facilitating complex and diverse forms of viewer or user engagement [4]. Audiences now actively interact with media content, integrating these media texts into their lives according to new patterns of consumption [5].

The popular American TV series Game of Thrones (GoT) – a HBO adaptation of George R.R. Martin's fantasy saga – is an excellent example of a transmedia project. The narrative structure of this series extends well beyond the boundaries of the traditional TV medium to create a richer, deeply immersive entertainment experience [4]. The arrival of mobile "smart" devices in conjunction with a variety of other devices has resulted in a convergence of offline worlds with online environments, computerised gamesplay and social networking activities in a complex ecology of engagement platforms [6].

The proliferation of media platforms, and digitised media content, however, has made understanding what people are doing with this media and how they are engaging with this media in their lives more difficult and complex. This case study examines a six-month snapshot of user's twitter activities in relation to GoT, the world's most widely followed TV

franchise, which has established a reputation for being actively discussed on social media channels [5]. This microblogging platform allows dynamic, real time engagement and interaction with viewers. This analysis will explore subtle user behaviours across the sub-worlds of GoT and enable identification of which media and devices users are engaging with most, and identify what events are provoking this engagement. Organisations are investing heavily in new media and technologies in order to enrich audience's experiences, (sports brand Adidas, for example, recently announced it will focus its marketing efforts exclusively on digital and social channels) while at the same time viewer Twitter activity enhances audience's experience while not costing any extra money. Understanding which media and experiences users are finding most engaging, as well as learning from those which don't work, is of critical importance to ensuring the most effective return on this investment.

II. Methodology

A. Data set

We collected the complete followers list of the Games of Thrones Twitter account and then randomly picked 350, 000 users from among them. We collected data from the 300,332 users among this random group whose timeline was publicly shared over a 6-months timeframe from June 3rd to December 3rd, 2017. This timeframe enabled us to analyse behavioural patterns among users before, during and after the TV show aired (from July 16th to August 27th, 2017).

B. Methodology

In this work we considered only those user activities (tweets, retweets, quotes and replies) which require significant user interaction (beyond tapping a like/favourite) indicating viewers were talking about the show, yielding a total of 16,414,172 distinct activities. To identify only those activities related to the Game of Thrones topic in this dataset, we compiled a list of keywords (215 in total), based on GoT world in general, HBO (e.g. promotional campaigns, episodes' titles, actors' name) and GoT books (e.g. titles, characters). We searched for these in the *text*, *hashtags* and *user mentions* status fields. This yielded a final total of 203,408 user activities which formed the dataset we used for our analysis.

To begin, we first identified the media category addressed in the *text*, *hashtag* and *user mentions* fields in order to analyse the spread of activities from the crawled community across different media. We used the following media categories: **TV** (194 topic words), **Books** (71 topic words), **Games** (162 topic words), and **Video** (4 topic words in total). We further defined another two categories: **TV-book**, describing activities related to both TV and book media (like a status comparing the TV show and the books), and **Other**, describing activities related to GoT, but falling in none of the previous categories.

We next analysed the timing of the activity related to each media category and most used devices for posting a TV status update. Finally, we identified most popular hashtags (filtering out the generic and high-level ones (e.g. name of series, TV show)) and topics discussed across all dataset. For the topic detection task, we used Tag.me[1] APIs; this enabled us to identify GoT Wikipedia entities referred to in the text of the content analysed. Entity linking algorithms automatically incorporate stopword removal, bigram recognition, entity identification and disambiguation. Moreover, they can enrich the representation with features which do not explicitly occur in text: for example, if an entity is mapped to a Wikipedia page, it is possible to browse a Wikipedia categories' tree to further enrich content representation introducing most relevant ancestor categories of that page [7].

III. Results

The results of this analysis are presented below.

A. Media Category

In Fig. 1, we plot the timing of user activity for each media category. As is clearly visible from the plot, there are significantly higher levels of actions around the GoT TV show as opposed to the other media identified. A substantial increased activity in the Other category is also present, suggesting a close relationship to the TV show. We will explore this point later in our Analysis Section. We can note definite spikes visible for both the TV and Other categories. These spikes correspond to the next day after the broadcast of a new episode of the seventh season of GoT. Generally, we can also observe higher activity levels during July and August 2017, when the TV show aired.

Removing the information regarding the TV and Other time series from the plot, we observe the same activity pattern, albeit with a lower number of activities, for the remaining media categories, especially the *Book* and *Video* ones.

Fig. 2 offers a zoom-in of the TV-related time series during the TV show airing. The first spike – 21st June – is related to two promotional events: the release of the second official trailer and the launch of the emoji campaign through the *Twitter Emoji Engine* to unlock special content (emojis and posters). We can observe the second spike happening one week before the airing of the first episode. The remaining spikes refer to the seven episodes of the considered season with the premiere and finale exhibiting the highest levels of Twitter activity.

B. Devices

To get an insight into the proportion of different devices used by users to publish a TV show status update, we plot the pie chart shown in Fig. 3. It illustrates that half of the activities come from the Apple iPhone and, more generally, that most activities are produced from a mobile phone.

C. Top hashtags

Our analysis of the most common hashtags found in our GoT activities dataset revealed that the most used hashtags are those standard, generic hashtags like the name of the show: *#gameofthrones*, and different abbreviated versions of it, like *#got* and *#got7*. Having removed these common elements from

[1] http://tagme.di.unipi.it

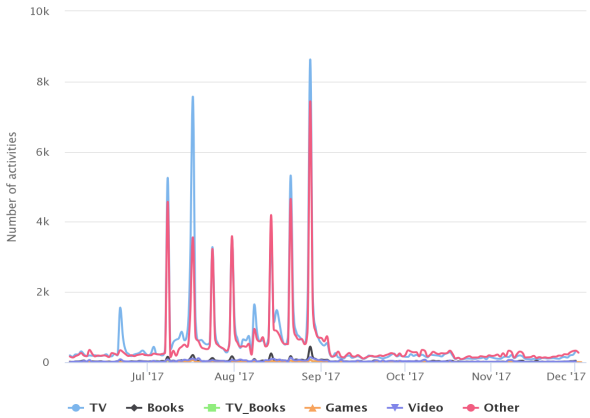

Fig. 1. Number of per day activities for each media category.

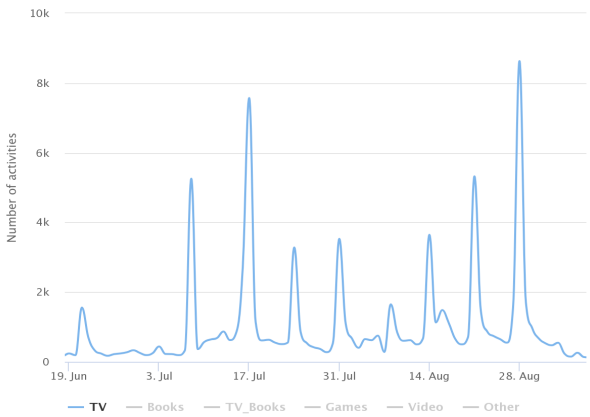

Fig. 2. Number of per day TV-related activities during the TV show airing.

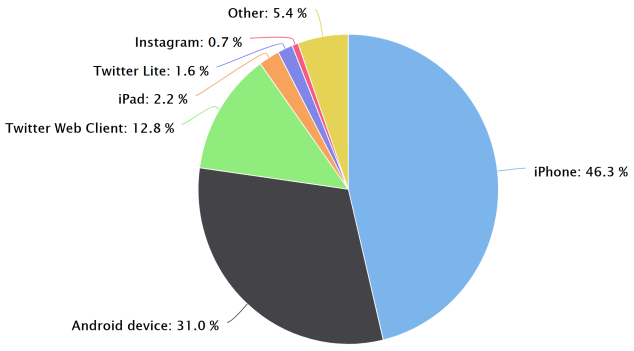

Fig. 3. Different devices used to publish a TV show status update.

our list, the top-5 hashtags found are: (i) *winterishere*, (ii) *thronesyall*, (iii) *gotmvp*, (iv) *gameofthronesfinale* and (v) *prepareforwinter*. In this list, we find hashtags related to the HBO campaign, e.g. *#winterishere* and *#prepareforwinter*, used to promote the seventh season of the TV show as well as user generated ones, like *#thronesyall*. We also identified hashtags related to different marketing campaigns, like *#gotmvp* used by AmazonChannel Twitter account to gain followers through a poll. Other popular hashtags include characters' names, other HBO promotional campaigns like *#winteriscoming* and *#noconfederate* (to support protest against Confederation) and episodes' title.

D. Topic Detection

The topic analysis ran on our dataset highlights that the most spread topics are related to two main categories: (i) Game of Thrones storyline characters, with Jon Snow as the most discussed character, followed by Arya Stark, Daenerys Targaryen and Sansa Stark, and (ii) locations, either described in the books or used as filming set – identified under the Wikipedia entity World_of_A_Song_of_ice_and_Fire. Other popular topics are: quotes in Valyrian language, the cameo of the singer Ed Sheeran in the first episode of the seventh season and TV show actors.

IV. Analysis

Following an analysis of these results, we can now characterise the behaviour of users according to the extent of their activity, the medium being discussed, the timing of this activity, the devices used for this activity and the most popular topics used throughout the period of analysis.

A. Media Category

The highest user activity is clearly evident around the TV show during the two months the TV show is aired and specifically on the Monday after the show is aired on the Sunday. Topic analysis of our dataset reveals the topics discussed in the *Other* category to be almost the exact same as those in the *TV* category, suggesting that these uncategorised actions actually relate to the *TV* category. If these two categories were combined into one TV show category, the resulting increase in TV related tweets would be hugely significant. Of further interest is that while other media exhibit lower levels of activity than the TV show, this activity follows the exact same pattern as the TV suggesting that the TV show stimulates interest in these other media. Interestingly, the lowest level of user activity relates to the *Games* topic, and our later hashtag analysis revealed this activity to be focused around *art* and *cosplay*. Given the level of investment digital games require, this is an important finding suggesting this investment would provide a better return in other media.

B. Timing

Analysis of the timing of user interaction during the TV show's airing (Fig. 2) reveals clear peaks of user activity throughout the season. Specifically, the highest levels of user

activity are evident in the season finale (8.5k tweets), followed closely by the premiere (7.5k tweets) and the final trailer and *Twitter Emoji Engine* release (5.2k tweets). The lowest user engagement (1.5k) is evident after episode 4. This insight into user activity over time indicates a clear opportunity for HBO to more actively engage with users at these predicted lower-engagement points to stimulate user activity and ensure that GoT remains highly active in fans' twitter feeds.

C. Devices

Our analysis of the devices used for this GoT Twitter activity clearly illustrates the predominance of mobile activity. This preference is as likely to be related to the Twitter application itself, and users' preferences for using the Twitter application on a mobile device as to any specific preference related to the GoT community or the use of a second screen while using the primary screen for viewing activity (more typical of sporting or reality TV events).

D. Hashtags and Topic Analysis

Our analysis of the collected Twitter dataset with regard to the most used or popular hashtags indicates that HBO campaigns used to promote the seventh season of the GoT TV show, user generated hashtags and other non-HBO marketing campaigns (AmazonChannels Twitter account's *#gotmvp*) all featured in the top five hashtags. Thus, HBO are benefitting not only from their own promotional campaigns, but also from having content made by fans shared by fans at no extra cost. Topic analysis of the texts of the Twitter dataset revealed GoT storyline characters and locations to be the most discussed topics. Given the generic nature of these topics, further sentiment analysis could be beneficial to identify viewers' reactions to these topics in order to make recommendations to HBO on future content development. More interestingly for HBO, quotes in the Valyrian language and the cameo of the singer Ed Sheeran in the first episode of the seventh season were both notably popular discussion topics. These suggest potential positive directions for future HBO content to stimulate higher user engagement.

V. Conclusion

Many businesses are leveraging social media to achieve their strategic goals, to promote and advertise their products and connect with their customers. Analysis of users' interactions via social media helps companies better understand the needs of their customers and helps them elicit and maintain users' engagement and loyalty in an increasingly volatile and competitive environment [8].

Results from this study showed that while users actively engage with the GoT universe, this engagement is largely around the TV show, on the day after it is aired and predominantly using mobile devices to post status updates. Closer examination of this behaviour reveals the highest levels of user interaction around the S7 finale, followed by the premiere and then both the trailer and penultimate shows, while user engagement clearly drops off during mid-points in the season's airing. Combining this knowledge with our later analysis of tweet content (hashtags and topic analysis) enables recommendations to be made regarding HBO interventions to stimulate higher levels of user interaction at these times of lower user social media activity. Given the level of user activity around the HBO *Twitter Emoji Engine* release, Twitter campaigns and polls, and famous cameo appearances we recommend these devices be used to stimulate user engagement at these mid-points and ensure the GoT brand is kept alive.

This characterisation of user behaviours also presents potential investment opportunities for content developers to mine this active social interaction the day after the TV show airs to inform the development of forthcoming content. Future research analysing user sentiment would provide further behavioural insights as to users' preferences and dislikes regarding storyline manipulations. This sentiment analysis could also provide further insights into the impact of the diverse enrichments to the TV show suggested above (such as the emoji engine or snapchat filters) enabling an evaluation of their success.

Finally, another related research direction and suggested line of enquiry could examine the behavioural implications of the levels of User Engagement via Twitter and second screens on users' attention and cognitive performance on a variety of tasks. This would be of particular interest in applying the learnings from this GEM context to users in domains outside the GEM context, such as education, health or work.

Acknowledgment

Alessia Antelmi thanks the Erasmus+ grant, Guangyuan Piao and Ihab Salawdeh who contributed suggestions for the paper.

References

[1] Boyle, E. A., Connolly, T. M., Hainey, T., & Boyle, J. M., "Engagement in digital entertainment games: A systematic review." in Computers in Human Behavior, 2012, 28(3), 771–780.

[2] Amir Zaib Abbasi, Ding Hooi Ting, and Helmut Hlavacs, "Engagement in Games: Developing an Instrument to Measure Consumer Videogame Engagement and Its Validation," International Journal of Computer Games Technology, vol. 2017, 10 pages, 2017.

[3] Hollebeek, L.D., "Demystifying customer brand engagement: exploring the loyalty nexus," Journal of Marketing Management, 2011, vol. 27, no. 7-8, pp. 785–807.

[4] Askwith, I. D. Television 2.0: Reconceptualizing TV as an engagement medium (Unpublished master's thesis). 2007 Massachusetts Institute of Technology, Cambridge, MA.

[5] Scharl, Arno, Hubmann-Haidvogela, Alexander, Jones, Alistair, Fischla, Daniel, Kamlova, Ruslan, Weichselbraun,Albert, and Rafelsberger, Walter, "Analyzing the public discourse on works of fiction–Detection and visualization of emotion in online coverage about HBO's Game of Thrones" in Information Processing and Management , 2016, 52 pp. 129–138.

[6] Breidbach, C.F. , Brodie, R. and Hollebeek, L., "Beyond virtuality: from engagement platforms to engagement ecosystems", Managing Service Quality, 2014 Vol. 24 No. 6, pp. 592-611.

[7] Musto, Cataldo, Semeraro, Giovanni, Lops, Pasquale, and de Gemmis, Marco, "CrowdPulse: A framework for real-time semantic analysis of social streams" in Information Systems 54 (2015) pp. 127-146.

[8] Voorveld, Hilde A.M., vanNoort, Guda, Muntinga, Daniel G. and Bronner, Fred, "Engagement with Social Media and Social Media Advertising: The Differentiating Role of Platform Type" in Journal of Advertising, 2018, Vol. 47, Issue 1, pp 38-54.