Twitter as part of operational practice and passenger experience on the railways

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Abstract. The paper examines social media in the management of rail operations. Using data collected through interviews and workshops with 14 rail stakeholders, a number of themes tie rail social media to human factors. These include (1) processes and organisation of functions for successful embedding of social media (2) HCI considerations for both staff and passengers (3) competency factors for staff (4) the importance of a system control perspective, to make explicit the flows of feedback and action that social media can mediate in operational rail processes.

Keywords. Social media, passenger experience, systems, control

1. Introduction

There is a growing role for Twitter on the railways both as a channel for rail stakeholders to communicate with their passengers, and for passengers to raise queries or concerns. This is potentially most relevant during the management of disruption. All the major rail stakeholders in Great Britain have active Twitter accounts, with approaching 4 million followers in total, with the larger accounts receiving many hundreds of Tweets each day. Even accounting for overlap and very occasional users, this is a substantial user base and Twitter now forms a major part of rail communication strategy (Pender et al., 2014).

From a research standpoint, there is knowledge of how passengers as stakeholders feel about Twitter (Passengerfocus, 2012). This includes a preference for its informal tone, a desire for rapid information and perceived benefits as a means to communicate directly with train operators. However, there is an acknowledgement that the use of Twitter is more instrumental than other forms of social media, which are perceived as more relevant to people's friends and family. To date, much less is known about how the work of running Twitter accounts is perceived and executed by operational staff themselves. This is useful objectively from the outside, and also for rail operators themselves to share good practice, including overarching bodies such as the Association for Train Operating Companies (ATOC) who can guide cross-industry codes of practice.

For example, rail disruption management is fluid, contingent on the specifics of events on any given day, and deeply linked to social processes of face-to-face and telephone communication (Farrington-Darby et al., 2006; Golightly et al., 2013). It is unclear how this control decision-making links to the provision of information to the staff who then communicate with passengers via Twitter. Working from the other direction, the people fronting Twitter accounts are the conduit for complaints, queries, intelligence about technical issues and so on, that either have to be answered by the Twitter teams themselves, or fed through to other functions involved in the operation of the railways. It is as yet unclear what these queries are and what the challenges in providing an effective response might be. The objective of the work presented in this paper was to understand the work and perceptions of those involved in managing Twitter accounts on the railways. The practical aim was to investigate cross-industry norms, and potential guidance, for the user-centred (both passenger and staff) delivery of Twitter strategy as part of more general strategy to support and improve the passenger experience. A concurrent aim was to understand, from a human factors standpoint, that nature of work in rail social media. This included typical issues associated with work in complex domains

- the nature of context and task requirements
- the role of technology
- skills, knowledge and demands placed on people,
- following from other work in complex socio-technical systems (e.g. Hollnagel and Woods, 2005), control and coordination to achieve effective performance.

These human factors issues form the focus for the rest of the paper.

2. Method

A workshop was conducted with 10 operational stakeholders in rail social media from Train Operating Companies (TOCs), the Association of Train Operating Companies, and Network Rail. Initial discussion at this workshop lead to the development of a semistructured question guide. The questions were as follows

- 1. What are the benefits of Twitter during disruption, to passengers, individual stakeholders, and the rail sector as a whole?
- 2. What are the drawbacks of Twitter for passengers, TOCs and sector as a whole?
- 3. What are the key elements of an effective Twitter strategy?
- 4. How do Twitter stakeholders coordinate?
- 5. What are the next developments for an effective Twitter strategy?
- 6. What are the main research gaps?

This guide was then used in 14 interviews with rail stakeholders including social media strategists, social media managers, real-time response staff and station staff. Many of the more senior staff had experience of being on the Twitter accounts themselves. Five of the interviews were conducted while staff were responding to tweets, allowing them to talk through the process and issues associated with their role. In total, this formed around 16 hours of interviews.

Written notes were taken during the workshop and all interviews. The notes were transcribed as soon as practical afterwards. Notes were then coded under the question themes listed above. The study was conducted with approval of the Ethics Committee, University of Nottingham. All participants gave written consent.

3. Results

The results of the workshop and interviews are presented according to the first four question themes above (as themes 5 (developments) and 6 (research) were less relevant to human factors of current operations, they have been omitted from this paper).

3.1 Benefits of Twitter

Twitter is seen as a responsive but informal channel for communicating with passengers in real-time. Rather than being a broadcast, it gives people a chance to interact with a

real person ("It is a human face" [participant 10]). Additionally it is a source of intelligence from passengers on events on the network that contributes to operational decision making. This intelligence can cover trains, stations, passenger behaviour, ticketing – all aspects of travel experience with participants able to give tangible examples of where passenger intelligence had informed operations. Also, by inference, feedback through Twitter can highlight information gaps, or mismatches, if queries continue to come in during incidents that show that information is not getting out, or is inaccurate, through other channels. Twitter provides a useful means of "nipping formal complaints in the bud" [part. 13], saving time and potentially solving problems before more complex and costly solutions are required. Also, people are more likely to give praise via Twitter than any other channel.

Outputs from Twitter can also be coupled with other data. For example, the use of photos embedded in Tweets can aid credibility (e.g. photos of flooded tracks to show why services are delayed). Overall, timely, well-coordinated messages can do much to show that action is being taken, and that passengers can be treated as individuals, creating a positive customer experience, even during the most severe delay. Twitter is perceived as creating a more customer-centric culture within the industry by forcing a more responsive, customer orientated response to the needs of passengers.

3.2 Drawbacks

The primary drawback of Twitter is dealing with the volume of messages. However, while disruption may be the time of greatest volume, it is more mundane queries regarding ticketing, journey planning and minor issues (e.g. locating lost property) that take the greatest proportion of time. There was a belief that during disruption there is a "single story"[part. 8] to disseminate, whereas individual queries need to be handled on a case by case basis. Twitter operators were observed to have to refer to a number of different resources (ticketing systems, timetabling systems etc.) or following up with other staff to answer queries. Sometimes this can involve explaining, say, complex ticketing regulations, all within one or two tweets of 140 characters each. This all has to be done swiftly with aspiration to respond in some form within a few minutes.

The mismatch between speed of response via Twitter and through other communication channels is an issue. Passengers on Twitter expect an instant response. Often the Twitter teams can offer that rapid response, but this may be ahead of other channels on the railways. When the response is more than just information or clarification, Twitter-based information needs the operational channels available for change to be prepared to take action. For example, if a Tweet comes through that the heating is too high in a carriage, there needs to be a way to do something about that. These operational channels are not always in place.

There are issues around the correct competencies – the best operational staff don't always make the best Tweeters, and visa versa. Managers believed it needed a very special approach, particularly given the very public and lasting nature of any communication that they sent out ("Once it's out there, it's out there "[part. 10]). This is exacerbated with issues around trolls, spoof accounts (especially when they confuse users), and the fact that some Twitter users can be very abusive through the anonymity that Twitter brings ("its a very easy tool to vent on" [part. 5]), though other Twitter users sometimes provide severe reprimand (e.g. rebuking Twitter users who make abusive comments during fatalities).

A further drawback is the demographic of the Twitter user. They only form a small part of the travelling public, and it is possible they are metropolitan, younger users. Therefore, there was an acknowledgement that caution must be taken to embed Twitter within a broader understanding of passenger information, and make sure that Twitter is not the only source of information.

3.3 Success factors

As noted above, having the right people is perceived as being key to success. It is a specific mix of skills requiring technical knowledge of the software, operational knowledge of the railways, an ability to express themselves on social media, a "thick skin" [part. 7] while being "empathic" [part. 13]. Most crucial though is a customer-centric attitude – a "willingness to understand our railway and help someone - that's it." [part. 3].

Beyond that, integration within the control room was seen as being important to success. While many teams started as part of marketing or customer relation functions, they soon found this was too slow and many have moved physically into the control room sitting alongside control staff ("Our environment is 100% to what we do" [part. 8]). Wide empowerment and training with Twitter can help as many staff as possible become literate with using Twitter and social media generally, though it was still seen as key to have a core team to manage the central message.

Many of the stakeholders expressed their was initially a general anxiety or dismissal of social media as part of the control environment, but control (and rail staff generally) have been won over by (1) extended efforts to promote the role of social media, for example as a buffer or first line of defence in dealing with issues or complaints (2) that social media can provide a source of information about operations that can, occasionally, be faster and more accurate than traditional channels. Engagement is still, however, an ongoing task.

The physical coordination of Twitter teams is also linked to a virtual coordination. Participants expressed the importance of "one version of the truth" [part. 8], particularly during disruption. This often meant having to wait on giving a response during disruption until that picture was confirmed within the control team. This need to get people to have a single view of replanning extends to the passengers themselves to have them operating to a single plan (""you are trying to pull people into one time frame"[part. 3]).

Other success factors include the importance of tone. This needs to strike a balance between informal, confident, and having messages that are not swamped with trivial information. This is particularly relevant during disruption where there is an emphasis on getting the right information out, though outside of disruption another tone is possible, and many Twitter staff, particularly at the TOCs, are encouraged to show their personality.

On this note, the importance of having the right strategy is part of the strategy in itself. Different TOCs, and different rail stakeholders generally need to take different approaches. This is influenced by geography, the volume of both travellers and Twitter followers, and the type of service (long distance vs commuters).

3.4 Coordination across organisations

Coordination across organisations was an important part of the perception of a seamless railway, yet different stakeholders have different roles to play, particularly during disruption. Sometimes this is because an event requires coordination between Network Rail and a TOC, or sometimes because multiple TOCs are involved in the same event, or because passengers are likely to be taking cross-TOC journeys. Urban-based TOCs and station accounts also have to coordinate with local transport (e.g. TfL). Also, disruption may involve alternative service plans that include ticket exchange. However, when asked whether passengers had a good understanding of the role of various stakeholders (who might all be contributing via social media during a disruption) the

unanimous feeling was that they did not, but also that they should not have to. The contract was made with the TOC and they should have the responsibility to keep passengers informed and they had ultimate responsibility for their travelling experience. Nonetheless, behind the scenes the feeling from stakeholders is that close coordination is important, and something they actively strive to achieve, making best efforts to proactively pick up on messages relevant to them coming through other TOC accounts (e.g. picking up hashtags and mentions), as well as having a good ethos of forwarding on, responding to, or retweeting messages from other TOCs, Network Rail etc. Generally, there was a sense of the Twitter 'family' on the railways.

4. Discussion

Turning first to the nature of context and task requirements, the key finding is the way that many stakeholders have moved their social media teams into the control environment. While the potential value of Twitter to operations had been identified earlier (Houghton and Golightly, 2011) this embedding is now a reality and widespread. The transition has not always been straightforward, but the combination of selling the value of social media to operations, and by proving a 'first line of defence' rather than surveillance has lead to general, though not complete, acceptance. The embedding within control suggests that Twitter would need to be considered in future analyses of rail control environments and operations. The finding that the principle and most complex tasks of social media are not always in disruption, but more often in answer specific queries is also interesting. It suggests that future efforts to study the role of Twitter in operations must take a more general stance then simply looking at information during disruption.

Turning to the tools, and Human-Computer Interaction, the findings of this study suggests (as an extension of Farrington-Darby et al., 2006) gathering the information involves much social contact and coordination. Nonetheless, key tools (the rail messaging system, Tyrell; timetabling tools) are used heavily. In some cases, these platforms are used to try and pre-empt or observe where delay might be occurring, before official announcements are made. Together, these tools form the "single version of the truth" that is critical if all information channels, not just Twitter, are to present a coherent picture to passengers. Further work to understand how this "single version" is constructed and maintained would be valuable for all disruption communication process, not just Twitter.

The implications of these results are maybe as profound for the HCI of passengers. Two challenges were identified (1) presenting coherent information when multiple agencies are involved, given that passenger neither have, nor should be expected to have, an accurate mental model of the role of stakeholders. A single hashtag strategy during disruption might be a useful first step, based around terms (e.g. locations) that passengers, rather than rail specialists understand. (2) Not all rail users are Twitter followers, and there is a question of how Twitter based communications could be used more widely. Interestingly, National Rail Enquiries already use Twitter updates as a feed in their more general disruption information on the website and aggregating applications such as www.commutelondon.com offer a means for non-Twitter users to access and benefit from Twitter information. Future research should examine whether this benefit is realised by non-Twitter users, and does it overcome potential mistrust of Twitter-based information still expressed by many people.

It was not anticipated at the outset of this project that the role of fronting Twitter accounts would require such a range of skills and knowledge. For a start, the kind of people who fulfil these roles are not the typical time-served railway staff that one

usually sees in the control room. They are younger, typically come from a comms or customer service background, and often come with a personal interest in social media. This brings an interesting dynamic to the traditional role of representing the railways to the public, and the TOCs in particular are keen to make the most of this. That said, it is a difficult job and requires a need to be accurate in answering complex queries in a pressurised and public environment. Formal training, including simulation exercises takes several weeks, but requires many months of practice to develop the diverse knowledge of operations to be able to address all questions. Also, it is not a role that suits everyone. This kind of public facing social media role, which is increasingly becoming a key means of contact in a number of safety-critical settings involving the public (e.g. managing crowds at major sporting events), requires further examination to understand how best to recruit, train and retain such staff, and what constitutes their well-being.

Finally, the railways always prove a fine example of a domain that needs to understood in terms of how control (in the general sense) is coordinated and maintained, and how homeostasis is restored during times of disruption. Twitter is not simply a means of providing the public with information. The flow of information to and from passengers at such a speed is now a new way to shape passenger behaviour, particularly at times of disruption. What is most interesting is that this can now occur before people get to the railways (a station manager who also ran the station Twitter account commented how valuable it was to get information to passengers to "head them off" [part.1], before a situation escalated) giving railway communicators an unprecedented reach. What remains to be seen is how this new informational capacity is used longer term – does it become another means to 'stretch' the system (Hollnagel and Woods, 2005), or does it provide a long-term systemic advantage. Future analysis will take a more controltheoretic perspective on Twitter in control, and may speak to more traditional controller roles, described in Farrington-Darby et al (2006) to gather their perspective.

5. Conclusions

The conclusion of the work presented here is that Twitter has moved in a period of five years from being a peripheral or potential tool for railway operations (Houghton and Golightly, 2011) to one of the central channels for communicating with the travelling public. This work is more complex and requires a far higher level of personal competency and organizational coordination than might be expected initially. One implication for human factors work in rail control is that Twitter and other forms of social media must be explicitly considered as part of control process and within models of topics such as disruption management. Another implication is that future studies of passenger experience, and passenger information, must explicitly consider Twitter. A future topic of research is to establish where Twitter fits within a broader ecosystem of passenger information, and how different information channels can complement each other for effective passenger management, optimum passenger experience and multiplatform user-centred information provision.

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