Exploring online mechanisms of public engagement in risk communication: Insights from the European FoodRisC project

Liran Christine Shan

University College Dublin

christine.shan@ucd.ie

Áine Regan

University College Dublin

aine.regan@ucd.ie

Patrick Wall

University College Dublin

patrick.wall@ucd.ie

Áine McConnon (Corresponding author)

University College Dublin

aine.mcconnon@ucd.ie

Abstract

Public engagement is advocated in risk communication and can occur at different levels including public consultation and participation. Such engagement has traditionally been achieved by mechanisms such as focus groups or citizen juries; however, the growth in online interactive media platforms and tools has provided new opportunities. Drawing on research outcomes from the EU-funded FoodRisC (Food Benefit & Risk Communication) project, this article aims to demonstrate online opportunities for public engagement. First, the mining and analysis of user-generated content online has provided a new mechanism for public consultation, assisting communicators to understand public concerns, opinions and information dissemination behaviours in different scenarios. Second, interactive information deliberation tools exemplified by VIZZATA™ have created a new avenue for public participation, allowing researchers and practitioners to encourage and understand public

deliberations over risk information. Collectively, the findings from the FoodRisC project highlight the opportunities and challenges for online mechanisms of public engagement in risk communication.

Introduction

The process of communicating risks relating to food has traditionally assumed a top-down approach, with information flowing from authorities and scientists to the public in a one-way manner (Gurabardhi, Gutteling, & Kuttschreuter, 2005). This approach alone cannot guarantee effective communication as it overlooks the public's active role in receiving risk information and fails to account for their information needs, concerns and opinions (McCarthy & Brennan, 2009). To encourage a two-way, interactive communication process, increased public engagement has been widely advocated. It is suggested that public engagement can occur on a spectrum from lesser to greater engagement, with three levels defined: public communication, public consultation, and public participation, highlighted in Figure 1 (Rowe & Frewer, 2005). Public communication mirrors the traditional one-way form of communicating to the public. With public consultation, information is conveyed from the public to the risk communicator, and the information is believed to represent public opinions' on the risk in question. With public participation, information is exchanged between the public and official communicators with dialogue and deliberation occurring.
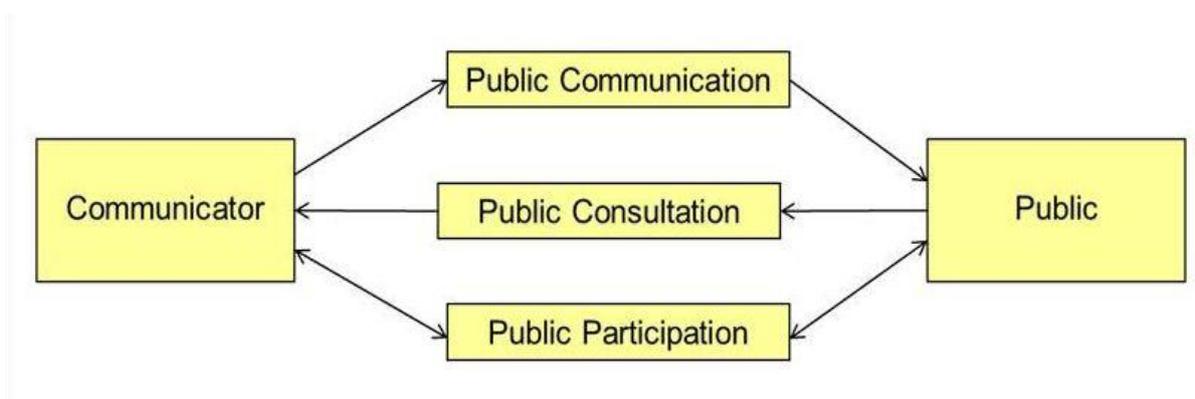

Figure 1. Different levels of public engagement determine the flow of science and risk information between the communicator and the public. *Adapted from (Rowe & Frewer, 2005)*

Whilst there is widespread encouragement for public engagement in risk communication, it has been difficult to integrate into practice because of uncertainties over the most appropriate techniques, processes, and instruments (i.e. mechanisms) (Rowe &

Frewer, 2005). The development of online communication platforms has opened new avenues and mechanisms for public engagement (Min, 2007). Online platforms are viewed as a valuable tool for informing, consulting, and deliberating with the public, and may provide a more accessible and resource-effective way of engaging the public. This paper aims to highlight the potential for online mechanisms of engagement by considering empirical examples from the EU-funded FoodRisC (Food Benefit & Risk Communication) project (www.foodrisc.org) (Barnett et al., 2011). This paper first considers online mechanisms for public consultation, specifically, the mining and analysis of user-generated content online. It then considers online opportunities for public participation focusing on the potential for interactive information deliberation through an online tool called VIZZATA^{TM.}

Mining & analysis of user-generated content online – new mechanism for public consultation

Web 2.0 technologies have enabled the general public to easily generate and share information. The value of user-generated content lies in the fact that it reflects ecologically valid, spontaneous, unsolicited opinions not affected by study demand or researcher bias (Regan et al., 2014). The information can be used to inform risk communicators on public opinion and societal discourse of a given topic.

In terms of data mining, many mainstream media agencies have incorporated comments sections into their news sites, which offer an easily obtainable source for communicators to assess public opinions and reactions. Example 1 below illustrates how to draw on the value of online comments. Social media such as Twitter, Facebook and blogs is another valuable source. However due to its heterogeneity and massive size, the mining and analysing of social media postings is not that straight-forward, typically including several steps as follows (Gaspar et al., 2014). First is the selection of keywords and keyword combinations that are used as search phrases. These usually cover formal references of the study subject, lay terms, and associated words to achieve the best balance between data completeness and accuracy. The next step is data retrieval aided by online tools or software. Examples of such tools are search services of popular sites (e.g. Twitter API, Facebook API), self-developed open source information surveillance systems (Chew & Eysenbach, 2010), and commercial social media monitoring tools (e.g. Hootsuite, Radian 6, MeltwaterBuzz) (Shan et al., 2013). The data are then analysed using different techniques such as content analysis, sentiment analysis and computer facilitated automatic analysis and visualization

depending on the research objectives. If undergoing manual analysis, sampling and the removal of irrelevant postings is usually necessary to reduce the data size to a manageable level. Example 2 & 3 below aim to illustrate the exploration of social media data.

Example 1: Understanding public resistance to dietary risk messages through the lens of online comments It has been recognized that public communication around chronic diet related health risks is a challenging task, since such risks are often met with a less than expected level of concern (Perez-Cueto & Verbeke, 2012). To understand lay negotiations of and resistance to dietary risks, an analysis was carried out on a dataset of 959 comments left in reply to two articles reporting health risks associated with red meat, published on a mainstream British news media website (Regan et al., 2014). The data underwent a manual thematic analysis and results showed that the comments generally expressed resistance to the risk message, with two strategies being used: 1) deploying rules of thumb (e.g. everything in moderation, humans have always eaten red meat, etc.); 2) attributing risk intensification to media, scientists and other stakeholders (e.g. irresponsible media amplifying low risk, flawed science without acknowledging other risk factors etc.) By exploring this user-generated content, the analysis provided an understanding of the types of arguments and strategies used by internet users to resist dietary risk communications.

Example 2: Understanding social media postings during the 2008 Irish dioxin crisis The rise of social media has made public discourse of food contamination incidents more visible than it used to be. Using Radian 6, a social media information aggregator, mentions of the 2008 Irish dioxin crisis (Shan et al., 2013) were retrieved to help investigate internet users' concerns related to this crisis as expressed on social media. Data was coded on publishing date, sourcing practice, story topic and use of tone. It was found that on social media, people mainly focused a limited range of topics including governments' handling of the crisis, global reactions, dioxin related health facts, and the impact on people' lives, with less attention on topics such as the cause of the incident, the influence on the Irish food industry, etc. 42% of social media postings expressed negative sentiments. Results also indicated that social media users' attention faded very quickly. This implies the importance of timely communication if one wants to capture attention on social media during food crises.

Example 3: *A psychological analysis of Twitter messages during the 2011 European E.coli outbreak.* Using the same social media information aggregator, researchers tracked tweets in Spain during the 2011 European *E.coli* outbreak to characterise citizens' coping strategies. It was found that public concerns peaked every time when the food sources of the pathogen were updated (Gaspar et al., 2014). Furthermore, coping strategies expressed on Twitter were dynamic, flexible and social, with a predominance of strategies including accommodation (e.g. adjustment to the options that were already available), information seeking (e.g. studying/reading information about the threat) and opposition (e.g. refusing to cooperate, active non-compliance, or doing the opposite of what is requested or expected).

Opportunities and challenges in mining and analysing user-generated data online

The examples presented demonstrate that online data has opened a new path to understanding public opinions and concerns. However, one needs to be aware that the information generated by internet users is exponentially increasing. Manual sampling and analysis is still useful for investigating specific research questions and gaining in-depth insights into data, however there appears to be a trend towards computer assisted auto-analysis and data visualization. In addition to the very basic content and sentiment analysis, computers now allow researchers to more easily map and identify things such as the most influential speakers, the most disseminated web-links, or interactions between social media users, etc. While keeping oneself updated about new technologies and resources in this area, researchers and communicators should keep in mind the limitation of online data in terms of representing ideas from the general public.

VIZZATA^{TM}, an interactive online deliberation tool for public participation

To facilitate deliberation and engagement with risk issues, public participation mechanisms have, until recently, largely taken the form of consensus conferences, citizens' juries, and public debates. Online mechanisms of engagement differ from offline mechanisms in that there is little opportunity for face-to-face interaction with the former. However, there could be advantages to the written and asynchronous nature of the online communication platform – it may support more reflexive, rational, and argumentative discussions (Halpern & Gibbs, 2013). People can take more time to formulate a response and the quality of the reply should reflect a more coherent argument and allow for a more rational-critical form of debate, all important features necessary for public participation (Blom, Carpenter, & Bowe, 2011;

Halpern & Gibbs, 2012). The online deliberation platform VIZZATA[TM] (www.vizzata.com) offers interesting potential in this regard. This platform was developed in part within the FoodRisC project to explore citizen engagement and deliberation of information in the form of an asynchronous dialogue between participants and the research team (Barnett, Fife-Schaw, Shepherd, Timotijevic, & Fletcher, 2008). The VIZZATA[TM] process consists of several steps (See Figure 2). In step 1, researchers invite participants to the VIZZATA[TM] study webpage and present information to them in bite-sized chunks (called 'content testers') to elicit questions and comments. The content testers can be text or non-text based information, such as news reports, images, video clips, audio clips, etc, and they are presented in a sequence of information pages. Researchers can also include a survey questionnaire to ask specific questions if they wish. In step 2, participants read the information and provide voluntary questions and comments by using the 'Ask a question' and 'Make a comment' dialogue box at the end of each content tester page. They are also asked to fill out the questionnaire if there is one. In step 3, researchers respond to all questions participants have submitted and the system sends responses to participants through email. In step 4, researchers invite participants to VIZZATA[TM] again to capture their final reflections. New content testers and questionnaires can be added in this step as well. As VIZZATA[TM] is designed as a dialogue flow between two ends of the communication, options exist for further interactions.
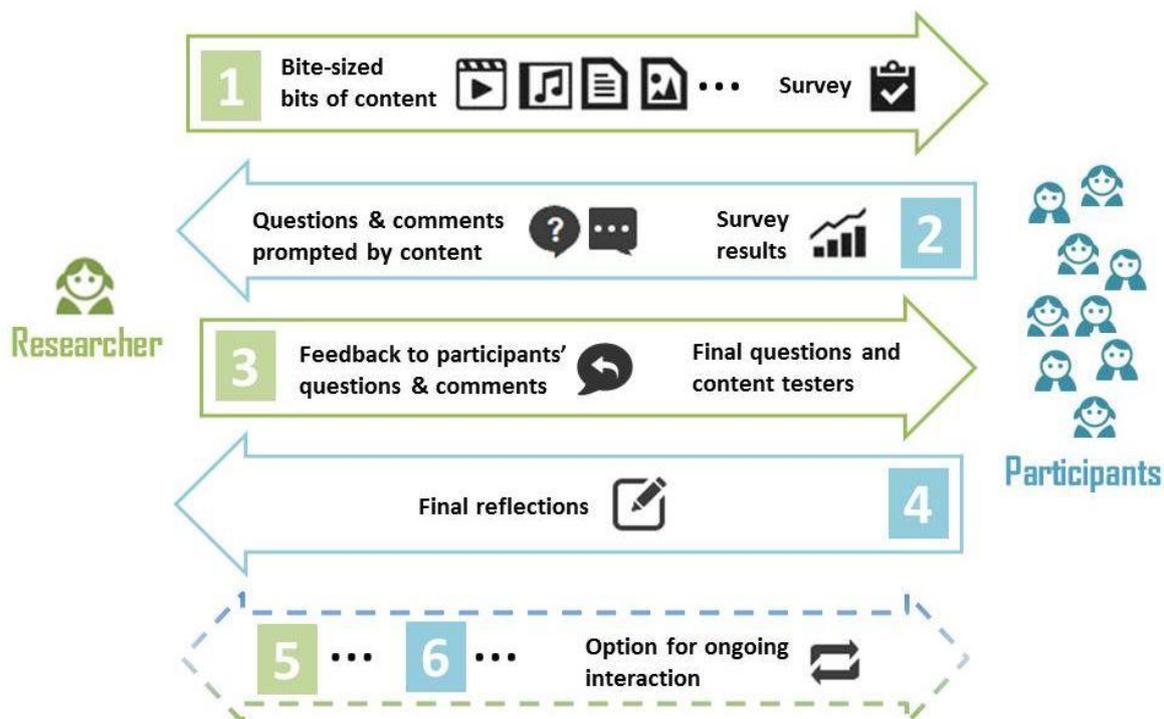

Figure 2. The workflow of a standard VIZZATA[TM] study

Example 1: Eliciting and influencing lay sense-making around synthetic meat. Public engagement with emerging technology at its innovation stage is very important, because it can help shape innovation processes in tune with wider public attitudes and minimize disruptive public controversy (Macnaghten, Kearnes, & Wynne, 2005). In 2012, an online VIZZATA[TM] study and a number of focus groups were carried out in 3 European countries (UK, Portugal, and Belgium) to explore how the public make sense of emerging food technology, where synthetic meat was used as an example (Marcu et al., 2014). A 2-minute long YouTube video, 'Would You Eat Synthetic Meat?', produced for the Royal Institution of Australia was used to elicit questions and comments. Seventy consumers participated in the online study showing various strategies to make sense of synthetic meat (Marcu et al., 2014). Researchers found that the anchoring to GMOs, metaphors like 'Frankenfoods' and common phrases like 'playing God' closed off debates around potential applications of synthetic meat, whereas asking factual and rhetorical questions about it, weighing up its risks and benefits, etc. enabled a consideration of synthetic meat's possible implications for agriculture, environment, and society.

Example 2: Consumer reflections on communications of the horse DNA contamination incident. On 15th January 2013, the Food Safety Authority of Ireland (FSAI) announced that they had found horse DNA in some beef burger products. The news quickly went viral and it soon became a public issue throughout Europe. To understand public deliberations of and reaction to different stakeholders' communications in real time, a VIZZATA[TM] study was created and launched on the 19th January, 2013. The content testers included announcements from food safety authorities in Ireland and the UK, an overview of the media reports at that time, a YouTube video showing a government official explaining the incident, and a food retailer's public apology letter. Over the following 9 days, 44 meat consumers from the UK and Ireland attended and finished the study. In total they left 348 questions and comments – indicating a considerable level of engagement with and deliberation over the presented material. Results suggested that consumers needed clarifications on issues in relation to traceability in the food chain, and food labelling and testing (Barnett, 2013). There was very little evidence of health risk concerns. Such knowledge gave food communicators a clearer direction to meet public concerns. Regarding the study itself, participants found it engaging, informative and interactive, and they valued the opportunity to freely express legitimate concerns.

Advantages and implications of VIZZATA^{TM}. The presented examples illustrate the flexible applications of VIZZATA^{TM} to encourage and explore deliberation on different risk topics. The unique mechanism of VIZZATA^{TM} in terms of eliciting questions and comments without facilitator bias and fostering a dialogic communication mode enables communicators to observe and influence the process of sense making. This has strong implications in testing and improving communications and engaging the public into information deliberation. Other advantages of VIZZATA^{TM} include increased speed and reduced cost compared with conventional methods, for example the horsemeat adulteration study was conducted at the very time when the investigation was still ongoing, providing data on the immediate reactions and sense-making processes of these consumers. This highlights its promising value in emergent situations. Furthermore, VIZZATA^{TM} allows for continuous dialogue, and thus it could be used for exploring how people's reactions change over time. On the side of limitation, due to the efforts needed to enable two-way conversation, available resources may limit the number of participants taking part in a VIZZATA^{TM} study. That said, the aim in such situations can be argued not to establish representativeness of the larger public, but to provide an in-depth investigation of the reasoning and concerns of consumers on a given topic. It's believed that VIZZATA^{TM} is a promising online mechanism for public participation.

Conclusion

Undoubtedly, public engagement involving bottom-up, two-way approaches are essential to the success of communications of risk, science and technologies. The growth of social media and online platforms has changed the landscape of communication and created new opportunities for public consultation and participation – two important dimensions of public engagement. Based on research outcomes from the FoodRisC project, the current paper demonstrated some of the opportunities and challenges facing this area, with particular focus on how to make the best use of user-generated content online, and how to foster an online dialogue between information sponsors and the public around food risk topics. While the examples illustrated in this paper relate to food risk scenarios, the methodologies and tools discussed have application to the wider spectrum of science communication.

Acknowledgement

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