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# **Twitter and NVivo: an Efficient Pair in the Qualitative Coding Technique**

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## Abstract

Being a trendy source of data for researchers, Twitter and NVivo are used in this paper to illustrate the qualitative coding approach. Firstly, we browse the qualitative research literature; secondly, we illustrate the well-known Grounded Theory (GT) process with a practical example of efficient coding using Twitter and NVivo. We conclude with research implications, limitations and future research directions.

***Keywords:* Twitter; NVivo; Coding; Qualitative Research; Grounded Theory**

## Introduction

On Wednesday, January 7th 2015, the horror of the terrorist attack on the satirical newspaper Charlie Hebdo shook France. Tens of thousands of tweets were spread to express people's solidarity. This sad news shows us the importance of social media and more specifically Twitter. Despite the microblogging service became a news media (Kwak, Lee, Park, & Moon, 2010), it remains an amazing source of data for researchers of all backgrounds.

Understanding and explaining social phenomena without data is next to impossible (Myers, 1997). The qualitative and quantitative analysis of data is a mandatory step to become a "pragmatic researcher" (Onwuegbuzie & Leech, 2005). Moreover, analyzing data through qualitative methods suits the exploration of new research areas (J. M. Corbin & Strauss, 2015). However, the question of how to take advantage of social media to conduct valid and reliable qualitative research has to be addressed. Could we conclude like Branthwaite and Patterson that "social media monitoring is a poor substitute for in-depth qualitative research" (2011)?

The purpose of this paper is to illustrate a qualitative approach using Twitter and a Computer Aided Qualitative Data Analysis Software (CAQDAS) like NVivo.

## Background

The distinction between quantitative and qualitative research is equivocal (Thiétart, 2007). Originally, quantitative research was developed to study natural phenomena (Avison & Myers, 2002). This form of research is usually associated with the postpositivist worldview. Quantitative research is an "approach for testing objective theories by examining the relationship among variables" (Creswell, 2013, p. 4). Survey research is a typical design of quantitative research (ibid. 2013, p. 13). Statistical procedures could be used to analyze data (ibid. 2013, p. 4). Qualitative methods were developed in the social sciences to enable researchers to study social phenomena (Avison & Myers, 2002). This is a kind of research in which "the researcher [...] collects and interprets data, making the researcher as much a part of the research process as the participants and the data they provide" (J. M. Corbin & Strauss, 2015, p. 4). Case study, ethnography, action research or grounded theory (GT) are typical designs of qualitative research amongst others (Creswell, 2013, p. 14; Recker, 2012, p. 88).

Should one choose qualitative or quantitative methods is an open-ended question? As Silverman says, there isn't 'right' or 'wrong' methods. They are only more or less appropriate ones (2009). Some researchers consider qualitative methods as subjective and quantitative methods as more objective. This point of view is a caricature. Quite the opposite, qualitative research requires rigor and scientific techniques (ibid. 2009). Corbin and Strauss give us reasons of why we should use qualitative over quantitative methods. Among them, qualitative methods are appropriate to "explore areas not yet

thoroughly researched”, “to discover relevant variables that later can be tested through quantitative forms of research”, “to take a holistic and comprehensive approach to the study of phenomena” (J. M. Corbin & Strauss, 2015, p. 5). Finally, the authors indicate that a qualitative researcher likes to ponder on complex relationships between variables (ibid. 2015, p. 5).

In our introduction, we allude to the possibilities offered by Twitter as a source of data for researchers. Data is to researchers what gas is to cars. Grounded theory, developed by Glaser and Strauss in 1967, suits the creation of theories based on data. “GT is a qualitative research method that seeks to develop theory that is grounded in data systematically gathered and analysed” (Urquhart, Lehmann, & Myers, 2010, p. 357). Data could be of various types like interviews, observations, figures, quantitative surveys, newspapers, videos, sounds or social media messages. One could find the use of quantitative surveys and figures as well as interviews surprising; however, the use of quantitative data in GT is sparse even if it is important to consider qualitative and quantitative data to avoid research misconduct (Walsh, 2014). Each type of data can be processed and analyzed in the same way as interviews or observations (Glaser & Strauss, 1967).

Recker points out one of the qualitative research characteristics. “Qualitative researchers typically gather a variety of data of different sorts” (Recker, 2012). There are many techniques for analyzing qualitative data. Coding, memoing, critical incidents, content analysis or discourse analysis. Coding is for sure the most popular technique (ibid. 2012, p. 92). For Strauss and Corbin, coding is the fundamental analytic data process (2008; 1990). Point and Fourboul Voynnet explain that coding is much more than affecting a category to data. It is a conceptualization process following different stages: discovering data, wondering about the data, interpreting it and understanding the links between data (2006). To operationalize this process, many coding approaches can be selected. In this paper, we present the two most used. The first was developed by Glaser and Strauss in 1967. The second is a variant initiated by Strauss and Corbin in 1990 (ibid. 2006).

Glaser and Strauss use a three-step coding approach. Step one, researchers systematic use of memos for code (ibid. 2006). Adding later that memos are too seldom used (Glaser, 2014). However, this is a fundamental tool in the analysis process. A researcher can write down ideas, codes, links and everything necessary to create future knowledge. There isn’t a formal form for a memo (Glaser, 2014; Point & Fourboul Voynnet, 2006). Step two, researchers produce diagrams to illustrate emerging concepts. Step three, based on grounded data, researchers check concepts (Point & Fourboul Voynnet, 2006).

Strauss and Corbin’s coding approach consists of three steps. They name these inductive techniques: open coding, axial coding and selective coding (2015; 1990). The qualitative analysis process changes for every researcher. Nevertheless, we can generalize the process as follows. Some analysts look for natural breaks in the manuscript to identify topics. Others, skim and the main topics emerge (J. M. Corbin

& Strauss, 2015, p. 86). The open coding is exploratory. It consists of identifying categories and developing them in terms of their nature, properties and relationships (ibid. 2015, p. 87; Point & Fourboul Voynnet, 2006). In the axial coding, the researcher focuses on the links between categories and subcategories. “Through the “coding paradigm” of conditions, context, strategies (action/interaction) and consequences, subcategories are related to a category” (J. Corbin & Strauss, 1990, p. 13). Open coding and axial coding are iterative steps. The final step is the selective coding. Its aim is to focus on the core category. “The core category represents the central phenomenon of the study” (ibid. 1990, p. 14). The other categories and subcategories will “stand in relationship to the core category as conditions, action/interactional strategies, or consequences” (ibid. 1990, p. 14). Corbin and Strauss insist on the usefulness of recording the qualitative analysis in memos or diagrams (J. M. Corbin & Strauss, 2015).

Computer Aided Qualitative Data Analysis Software (CAQDAS) such QSR-NVivo, MAXQDA, Cassandre or Atlas facilitates coding techniques and wider GT (Bringer, Johnston, & Brackenridge, 2006). In spite of this, some researchers indicate that CAQDAS doesn't suit GT. Indeed, it creates boundaries in the deep reflection process of the researchers (Kelle 1995 in Hutchison, Johnston, & Breckon, 2010). If used in the right way, these data analysis software may enhance GT techniques (Bazeley 2007 in Hutchison et al., 2010).

NVivo is a CAQDAS for analyzing quantitative and qualitative data (QSR International, 2015a). NVivo covers the full range of the GT process from the data collection to the creation of emerging concepts. Of course, this kind of software cannot substitute the researcher's reflection and should be used as more of a complement. The coding process is facilitated with NVivo.

With NVivo, you can import messages from social networks such as Twitter, Facebook or LinkedIn (ibid. 2015a). Using Twitter as a qualitative data source is a new phenomenon (Giglietto, Rossi, & Bennato, 2012). Twitter is a social media with more than 500 million messages (Tweets) sent every day. Social medias are “Web sites that make it possible for people to form online communities, and share user-created content” (Kim, Jeong, & Lee, 2010). Some academic papers focus on the importance of CAQDAS in GT but the contributions of the pair NVivo and Twitter hasn't been explored yet. Furthermore, methodological literature about using Twitter as a qualitative data source is sparse. That's why this paper aims to illustrate the qualitative coding approach using Twitter and NVivo. Has the era of coding 2.0 begun?

## Coding 2.0?

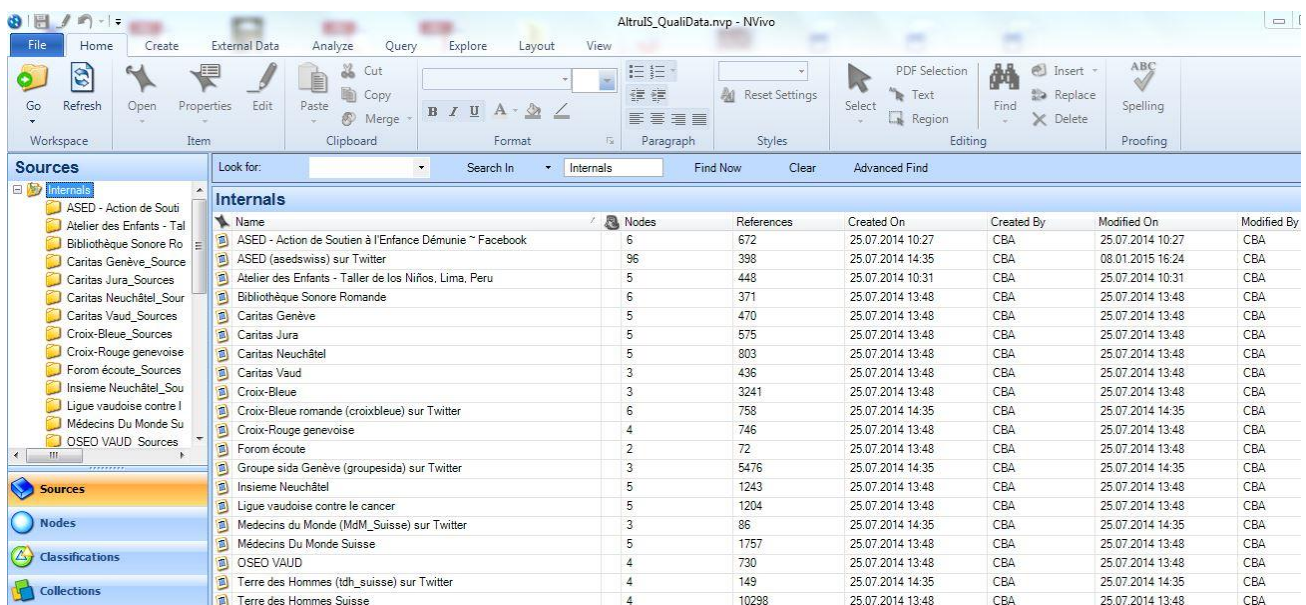
We conducted a research in 2014 about how non-profit organizations (NPO) take advantage of social media. We used a mixed-design methodology. Firstly, we established a clear picture of current social media tendencies in Switzerland. Secondly, we explored the actual use of these technologies by NPO. To achieve this second aim, we opted for a qualitative GT approach using Twitter and NVivo.

Based on this experience, we present a practical coding process based on the Strauss and Corbin's three step approach.

1. Collect data on Twitter with NCapture.
2. Open coding with NVivo.
3. Axial coding with NVivo.
4. Selective coding with NVivo.

### Collect data on Twitter with NCapture

NVivo is software for analyzing unstructured data. NCapture is a web browser extension design to gather information from social medias (QSR International, 2015b). After the selection of Twitter NPO's accounts, we captured the related tweets. We selected Swiss NPO with a Twitter account, tweeting in French. Then, we imported 3 318 tweets in NVivo as external data. Thus, we obtained information about tweets. Among them, the 140 characters of a tweet, the username of the sender, the time, the tweet type (tweet or retweet), the number of retweets, the username of the retweet sender, the associated hashtag, and the location coordinates of the message sender.

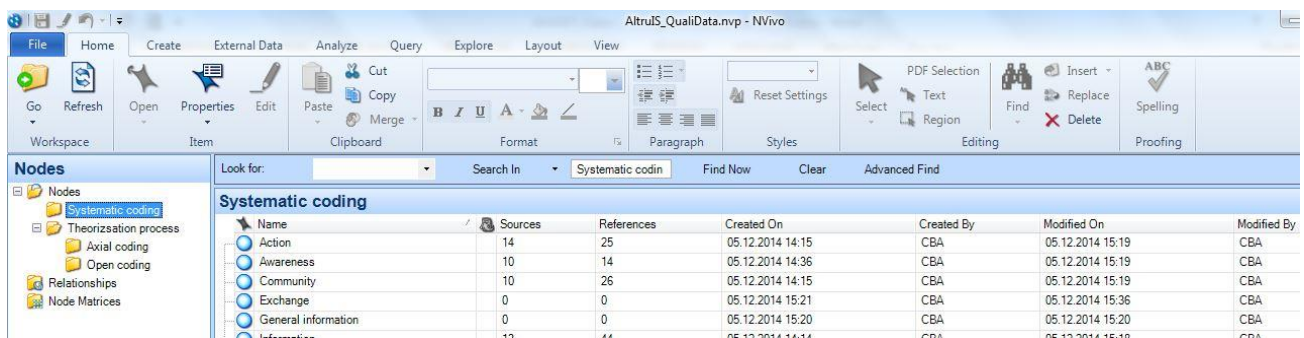


Name	Nodes	References	Created On	Created By	Modified On	Modified By
ASED - Action de Soutien à l'Enfance Démunie ~ Facebook	6	672	25.07.2014 10:27	CBA	25.07.2014 10:27	CBA
ASED (asedswiss) sur Twitter	96	398	25.07.2014 14:35	CBA	08.01.2015 16:24	CBA
Atelier des Enfants - Taller de los Niños, Lima, Peru	5	448	25.07.2014 10:31	CBA	25.07.2014 10:31	CBA
Bibliothèque Sonore Romande	6	371	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Caritas Genève	5	470	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Caritas Jura	5	575	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Caritas Neuchâtel	5	803	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Caritas Vaud	3	436	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Croix-Bleue	3	3241	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Croix-Bleue romande (croixbleue) sur Twitter	6	758	25.07.2014 14:35	CBA	25.07.2014 14:35	CBA
Croix-Rouge genevoise	4	746	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Forum écoute	2	72	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Groupe sida Genève (groupesida) sur Twitter	3	5476	25.07.2014 14:35	CBA	25.07.2014 14:35	CBA
Insieme Neuchâtel	5	1243	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Ligue vaudoise contre le cancer	5	1204	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Médecins du Monde (MdM_Suisse) sur Twitter	3	86	25.07.2014 14:35	CBA	25.07.2014 14:35	CBA
Médecins Du Monde Suisse	5	1757	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
OSEO VAUD	4	730	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA
Terre des Hommes (tdh_suisse) sur Twitter	4	149	25.07.2014 14:35	CBA	25.07.2014 14:35	CBA
Terre des Hommes Suisse	4	10298	25.07.2014 13:48	CBA	25.07.2014 13:48	CBA

Figure 1 - Tweets imported in NVivo

## Open coding with NVivo

Based on information of tweets, we started to code text units (a word, a part of a sentence, a sentence or a whole tweet). Then we regrouped codes in emerging categories. Finally, we developed the discovered categories in defining properties and positions based on the tweet content and related properties provided by Tweeter and NVivo. It should be noted that we prefer the term “position” rather than the official term “dimension” proposed by Glaser and Strauss (1967). The term “dimension” is confusing. Indeed, the granularity of a dimension change according its context. The meaning of “dimension” is different in a theoretical model, in multidimensional modeling or in coding technique.



The screenshot shows the NVivo software interface with a table titled 'Systematic coding'. The table lists various nodes and their associated data. The nodes listed are Action, Awareness, Community, Exchange, General information, and Information. The columns include Name, Sources, References, Created On, Created By, Modified On, and Modified By.

Name	Sources	References	Created On	Created By	Modified On	Modified By
Action	14	25	05.12.2014 14:15	CBA	05.12.2014 15:19	CBA
Awareness	10	14	05.12.2014 14:36	CBA	05.12.2014 15:19	CBA
Community	10	26	05.12.2014 14:15	CBA	05.12.2014 15:19	CBA
Exchange	0	0	05.12.2014 15:21	CBA	05.12.2014 15:36	CBA
General information	0	0	05.12.2014 15:20	CBA	05.12.2014 15:20	CBA
Information	12	14	05.12.2014 14:14	CBA	05.12.2014 15:19	CBA

Figure 2- Open coding with NVivo

## Axial coding and selective coding with NVivo

The purpose of axial coding is to create links between emerging categories (Thiéart, 2007). Information of tweets obtained with NCapture allows us to achieve this purpose (retweet for example). We haven't found a core category. For this reason, we didn't make the selective coding. Nevertheless, a deep exploration of core categories is possible based on the information gathered.

NVivo and Twitter are both excellent mediums to improve open, axial and selective coding. Indeed, tweet properties have to be explored. In addition to the “basic” analyze of tweet contents, researchers should examine new areas like the time of the tweet, the tweet type (tweet or retweet), who retweeted, the number of retweets, the hashtag, who is mentioned, the profile name, the biography of the person who tweets, the location coordinates, etc... Tweet types, hashtags or tweet times are typical information that are useful during the open coding process. Who retweets, who is mentioned or location coordinates inform researchers about links between categories. That is why it is useful during the axial coding process.



ID	Tweet ID	Username	Tweet	Time	Tweet Type	Retweeted By	Number of Retweets
1	489034479483494400	asedswiss	Avant le départ @Geneve_Aeroport ne manquez pas les affiches @asedswiss ! <a href="http://t.co/cjMHTq25z">http://t.co/cjMHTq25z</a>	15.07.2014 15:11	Tweet		0
2	482154827464867840	asedswiss	@asedswiss à la page 30 de @tdgch On vous attend à la Cité Bleue dès 18h30 #Geneve #ONG <a href="http://t.co/hR6oaakiX2">http://t.co/hR6oaakiX2</a>	26.06.2014 15:34	Tweet		1
3	481336189388345344	asedswiss	Patrick Nicollier chez #DetoursRTS le 26.06 pour parler @asedswiss. <a href="http://t.co/0yyKq6Pyqe">http://t.co/0yyKq6Pyqe</a>	24.06.2014 09:21	Tweet		0

Figure 3 – Tweets properties in NVivo (1)

ID	Hashtags	Mentions	Name	Location	Web	Bio	Number of Tweets	Number of Followers	Number Following	Location Coordinates
1		Geneve_A asedswiss	ASED	Genève (Suisse)	<a href="http://t.co/c4bbL6Moep">http://t.co/c4bbL6Moep</a>	Accès à l'éducation, ONG, autonomisation	91	16	99	+46.20222+006.14569/
2	Geneve ONG	asedswiss tdgch	ASED	Genève (Suisse)	<a href="http://t.co/c4bbL6Moep">http://t.co/c4bbL6Moep</a>	Accès à l'éducation, ONG, autonomisation	91	16	99	+46.20222+006.14569/
3	DetoursRTS	asedswiss	ASED	Genève (Suisse)	<a href="http://t.co/c4bbL6Moep">http://t.co/c4bbL6Moep</a>	Accès à l'éducation, ONG, autonomisation	91	16	99	+46.20222+006.14569/

Figure 4 - Tweets properties in NVivo (2)

### Results

Based on this process, we propose a categorization of NPO messages and practical implications for NPO e-community managers. Based on the GT process, we identified a four group message categorization: general information, action, dialog and messages to arouse sensibility (Baudet, 2015). NPO e-community managers should use more such messages before seeking volunteers. Messages related to news are the most retweeted. If they are well used, they can further the NPO’s cause (ibid. 2015).

### Conclusion

Twitter and NVivo, like other contemporary big data technologies, offer new opportunities to researchers. Localization information, retweets information (who to who) or user profiles are some concrete examples. In this context and if used with rigorous methodology, social media data and CAQDAS is a great complement for in-depth qualitative research.

Twitter is one source of data among so many others. We highlighted the need to triangulate qualitative data and to follow a rigorous way of processing this data.

This paper has limitations that should be pointed out. Among them, the fact that the proposed practical process is based on one only study.

Future research is needed to explore how social media can contribute to qualitative research. We wonder about the opportunities offered by the tweets properties in GT's memo or diagram techniques. Formal methodologies should certainly involve, in this context, future unknown quantities.

## References

- Avison, D. E., & Myers. (2002). La recherche qualitative en système d'information. In Vuibert (Ed.), *Faire de la recherche en systèmes d'information* (pp. 57–66).
- Baudet, C. (2015). L'utilisation des médias sociaux par les organisations sans but lucratif : une étude exploratoire. In *AIM 2015* (pp. 1–34). Rabat. Retrieved from <http://aim.asso.fr/index.php/mediatheque/viewdownload/34-aim-2015/1131-the-use-of-social-media-by-non-profit-organizations-an-exploratory-study>
- Branthwaite, A., & Patterson, S. (2011). The power of qualitative research in the era of social media. *Qualitative Market Research: An International Journal*, 14(4), 430–440.
- Bringer, J. D., Johnston, L. H., & Brackenridge, C. H. (2006). Using Computer-Assisted Qualitative Data Analysis Software to Develop a Grounded Theory Project. *Field Methods*, 18(3), 245–266.
- Corbin, J. M., & Strauss, A. C. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3rd ed.). SAGE Publications Ltd.
- Corbin, J. M., & Strauss, A. C. (2015). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (4th ed.). SAGE Publications Ltd.
- Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, cannons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications Ltd.
- Giglietto, F., Rossi, L., & Bennato, D. (2012). The Open Laboratory: Limits and Possibilities of Using Facebook, Twitter, and YouTube as a Research Data Source. *Journal of Technology in Human Services*, 30(3-4), 145–159. doi:10.1080/15228835.2012.743797
- Glaser, B. G. (2014). *Memoing*. Sociology Press.

- Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of grounded theory : Strategies for qualitative research*. New York: Aldine Transaction. Retrieved from <http://search.proquest.com/docview/37815640/13D588F8E8D69F67BB8/1?accountid=15920>
- Hutchison, a. J., Johnston, L. H., & Breckon, J. D. (2010). Using QSR-NVivo to facilitate the development of a grounded theory project: an account of a worked example. *International Journal of Social Research Methodology*, 13(4), 283–302. doi:10.1080/13645570902996301
- Kim, W., Jeong, O.-R., & Lee, S.-W. (2010). On social Web sites. *Information Systems*, 35(2), 215–236. doi:10.1016/j.is.2009.08.003
- Kwak, H., Lee, C., Park, H., & Moon, S. (2010). What is Twitter , a Social Network or a News Media ? In *International Conference on World Wide Web* (pp. 591–600). Raleigh.
- Myers, M. D. (1997). Qualitative research in information systems. *Management Information Systems Quarterly*, (June), 241–243. Retrieved from [http://www.inclentrust.org/uploadedbyfck/file/compile\\_resource/Qualitative\\_Research/Presentations/Qualitative\\_Research\\_in\\_Information\\_Systems.pdf](http://www.inclentrust.org/uploadedbyfck/file/compile_resource/Qualitative_Research/Presentations/Qualitative_Research_in_Information_Systems.pdf)
- Onwuegbuzie, A. J., & Leech, N. L. (2005). On Becoming a Pragmatic Researcher: The Importance of Combining Quantitative and Qualitative Research Methodologies. *International Journal of Social Research Methodology*, 8(5), 375–387. doi:10.1080/13645570500402447
- Point, S., & Fourboul Voynnet, C. (2006). Le codage à visée théorique. *Recherche et Applications En Marketing*, 21(4), 61–78. Retrieved from <http://ram.sagepub.com/content/21/4/61.short>
- QSR International. (2015a). [http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx).
- QSR International. (2015b). Qualitative Data Analysis Software. Retrieved from [http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx)
- Recker, J. (2012). *Scientific Research in Information Systems: A Beginner's Guide (Progress in IS)*. Springer. doi:10.1007/978-3-642-30048-6
- Silverman, D. (2009). *Doing qualitative research: A practical handbook*. SAGE Publications Ltd.
- Thiétart, R.-A. (2007). *Méthodes de recherche en management*. Paris: Dunod.

Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the “theory” back into grounded theory: Guidelines for grounded theory studies in information systems. *Information Systems Journal*, 20(4), 357–381. doi:10.1111/j.1365-2575.2009.00328.x

Walsh, I. (2014). Using Grounded Theory to Avoid Research Misconduct in Management Science. *The Grounded Theory Review*, 13(1), 51–57.