Content Analysis in Mobile Applications Studies - A Methodological Review

Análise de Conteúdo em Estudos de Dispositivos Móveis - Uma Revisão Metodológica

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Abstract

Research in mobile applications is increasing in size and scope (Wang, Xiang, Law, & Pui Ki, 2015; Morosan & Bowen, 2017). However, research applying content analysis in these newer online platforms has been scant. Hence, the purpose of this study is to analyze how the content analysis method has been applied in mobile commerce related studies, based on bibliographic research. The sample was analyzed in the light of five out of seven criteria used by Koll, Wallpach e Kreuzer (2010) in a multi-method evaluation. Challenges presented by the content analysis method in digital marketing researches showed to be unique, yet not insurmountable. The reflections discuss upon methodological approaches to online consumer behavior via interactive media/channels, expanding the knowledge in the use of content analysis for enlightening consumer behavior.

Keywords: Content analysis; bibliographic research; mobile; digital marketing.

Resumo

As pesquisas sobre dispositivos móveis estão aumentando em tamanho e escopo (Wang, Xiang, Law, & Pui Ki, 2015; Morosan e Bowen, 2017). No entanto, ainda são escassas pesquisas que apliquem análise de conteúdo com relação a estas novas plataformas on-line. Assim, o objetivo deste estudo é analisar como o método de análise de conteúdo tem sido aplicado em estudos relacionados a mobile, com base em pesquisa bibliográfica. A amostra foi analisada à luz de cinco dos sete critérios utilizados por Koll, Wallpach e Kreuzer (2010) em uma avaliação multi-método. Desafios apresentados pelo método de análise de conteúdo em pesquisas de marketing digital mostraram-se únicos, mas não intransponíveis. As reflexões discutem abordagens metodológicas para o comportamento do consumidor online via mídia / canais interativos, expandindo o conhecimento no uso da análise de conteúdo para este rico campo de conhecimento.

Palavras-chave: Análise de conteúdo; pesquisa bibliográfica; dispositivos móveis; marketing digital.

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1   Introduction

Mobile technologies are increasingly commonplace in business. In some countries, such as Brazil, the US or the UK, the number of smartphones surpassed that of notebooks (Gibbs, 2016), being the global trend that mobile will take over the majority of web browsing. As scholarly research in online and mobile applications is increasing in size and scope (Wang et al., 2015; Morosan & Bowen, 2017), assessing methodological requirements in the online ambiance gains importance. However, research applying content analysis in these newer online platforms has been scant, particularly when it comes to mobile applications.

The art of interpreting text and messages is a very old practice but, as a scientific method, its development occurred at the turn of the twentieth century in the United States, with a quantitative approach (Bardin, 2006). Regarding qualitative research, the application of content analysis technique traces back to the 50's (Kohlbacher, 2006), traditionally including television, newspapers and magazine adds. Then, the rise of the computers in the 60's gave the content analysis method a whole new perspective (Bardin, 2006). And later, the advent of the information era in the 90's has led to a push to analyze newer digital forms of media, such as websites and mobile applications. Therefore, the purpose of this essay is to analyze how the content analysis method has been applied in mobile commerce related studies. This work also seeks to make a brief conceptualization of the content analysis method, as well as its operationalization, when to apply it and most suitable reasons for its use. Finally, some limitations, advantages and disadvantages of the method are listed, particularly when applied to the mobile ambiance. The following reflections aim at discussing methodological approaches to enlighten the work of future scholars, particularly those interested in online consumer behavior via interactive media/channels.

2   Content Analysis

Content analysis is a set of communication analysis techniques (Bardin, 2006), definition which reflects the array of possibilities that comes with the method. At first, the technique referred to quantifiable aspects of text content (Kohlbacher, 2006), but nowadays it is largely recognized to be used on both quantitative and qualitative studies (A. R. Rocha & A. Rocha, 2014). The starting point of the content analysis is the message (Bardin, 2006; Franco, 2008), which is tightly related to its context, that is "central to the interpretation and analysis of the material" (Kohlbacher, 2006, p. 25), particularly in qualitative approaches.

The content analysis can be used as an interpretation method for qualitative content (Kohlbacher, 2006). For instance, the content analysis method is used to interpret meaning from the content of text data (Jafarzadeh-Kenarsari & Pourghane, 2017) or on the qualitative interview data to identify any comparable and contrasting themes from which new knowledge is identified (Miles, Huberman, & Saldana, 2014; Kohlbacher, 2006). The technique has been largely used in researches related to advertisement, since the technique "allows the interpretation of text and images, in order to make sense and extract the meanings embedded in ad messages" (A. D. Rocha & A. Rocha, 2014, p. 2).

According to Bardin (2006), content analysis has two functions. The heuristic function, which enriches the exploratory attempt, and the proof administration function, which provides guidelines. Indeed, one of the tendencies regarding content analysis is to use the method to test hypotheses as opposed to purely descriptive approaches (Franco, 2008). The method is intended to go beyond the common sense of subjectivism and achieve the necessary scientific rigor, but not the invalid rigidity (Mozzato & Grzybovski, 2011).

Bardin (2006) highlights four main steps involved in content analysis: pre-analysis; codification, categorization and analysis. In turn, for media-rich content, Hurwitz, Alvarez,

Lauricella, Rousse, Montague, & Wartella (2018) suggest the following steps for the content analysis method: include multiple sources to form the sampling; use screen-capture software to record the exploration of media products; analyze data using video coding software; and create a custom scale to determine the target audience of certain media products. Thought not mentioned as such, Hurwitz et al. (2018) recommendations can be embedded in Bardin's (2006) system, enriching and updating the method for the mobile ambiance.

2.1 Sampling and pre-analysis

The pre-analysis is the phase of the organization, where the data if defined for analysis; the research hypotheses or objectives are formulated; and the indexes are developed for interpretation (Bardin, 2006). Content analysis focusing on dynamic new media products such as websites or mobile applications presents a few methodological challenges (Hurwitz et al., 2018). When it comes to online sources, the first challenge refers to the massive volume of data available, which leads to the second challenge: framing the sample (Hurwitz et al., 2018). Which content amongst all is indeed relevant for the research question? Regarding the sample to be considered, Bardin (2006) recommends observing the following guidelines: completeness, representativeness, homogeneity and relevance. A path is to consult multiple sources to frame the sample, such as D. Kim and S. Kim (2017) and Hüseyinoğlu, Özge, Galipoğlu e Kotzab (2017) did. Last but not least, the highly interactive nature of online channels leads to a great deal of user experience variation among users (Hurwitz et al., 2018). On the other hand, one of the advantages of the content analysis method is precisely to help reduce the complexity of large volumes of data (Mozzato & Grzybovski, 2011). Content analysis involves the art of introducing order into an apparent disorder (Bardin, 2006). Nevertheless, that is no ordinary task. "Sampling can be daunting in the new media age due to the large volume of potentially relevant content" (Hurwitz et al., 2018, p. 537).

To begin with, the research should immerse in the data. Indeed, careful reading can increase the productivity and relevance of the data analysis (Bardin, 2006, p. 29). Plus, when collecting data, be careful in preserving content for further coding and reliability (Hurwitz et al., 2018).

With or without a computer software aid, the pre-analysis process must be flexible and yet precise at the same time (Bardin, 2006). The content overload leads researches to an analytical choice: aiming at breadth or depth? Relying on automated data analysis tools facilitates the analysis of large samples. However, some nuances and insights may elude in automated coding, requiring manually scoring the data (Hurwitz et al., 2018). This debate bumps into one of the critics/limitations of the method: the idea of quantification may obscure reaching deeper aspects of the text (Mozzato & Grzybovski, 2011).

2.2 Codification

To treat the material is to encode it (Bardin, 2006, p.103). The researcher must discover nuclei of sense whose presence or frequency may have meaning for the analysis. A risk in the coding process, however, is the researcher bias: a researcher familiar with the study tends to seek out and record content aligned with study hypotheses (Schmierbach, 2009). Notwithstanding, Franco (2008) guides that all statements, even those corroborative of opposing theses, be analyzed. Therefore, clear protocols are to be established in order to avoid such bias (Hurwitz et al., 2018).

Besides the researcher bias, there is also the risk of technological bias. When it comes to online advertisement data, to avoid potential contamination of the sample, due to profiling and retargeting, Hurwitz et al. (2018) created new computer logins and used new web browsers

free of any browsing history. They also bought new iPads and created new Apple accounts in order to avoid behavioral advertisement bias. Regarding the apps, the researchers video recorded the use (Hurwitz et al., 2018).

2.3 Categorization

Categorizing is creating classes of elements to support the analysis. In the case of using software, the indexes, key intermediate concepts between theory and data, also must be defined (Bardin, 2006). Safeguarding the quality and systematization requirements is necessary to guarantee the possibility of generalization of the data interpreted through content analysis (Franco, 2008). Therefore, this can be a long process, with constant comings and goings from theory to the data. A good set of categories must be faithful to the principles of objectivity and fidelity, that is, the subjectivity of the coders should be minimized as much as possible, so that categories are repeated in other analyzes (Bardin, 2006). Categories can be defined *a priori* or emerge from the data. Either way, they must be productive, working as fertile ground for inferences in the analysis process (Franco, 2008).

2.4 Analysis

The final stage of content analysis consists of a reflexive and critical interpretation of the data to answer the study's research question (Bardin, 2006; Franco, 2008). The inferential aspect, what can be extracted from the treated content, is of greater interest for the content analysis (Bardin, 2006). The purpose is to highlight a meaning hidden in the background, or, as Franco (2008, p. 29) puts it, "producing inferences is *la raison d'etre* of content analysis".

3   Methodology Applied in the Review

The forthcomings of technologies and the advances in academic research are an invitation for revisiting methodological approaches (Mozzato & Grzybovski, 2011). Therefore, this essay reviewed published articles within the mobile arena that applied the content analysis method. To spot seminal articles, as well as reference authors and themes in this field of study, a bibliographic research was performed. The data was gathered from Web of Science (WoS) Database in May, 2018. A ''Basic Search'' was conducted by specifying "content analysis" and ''mobile commerce'' or ''m-commerce'' or "apps" or "mobile marketing" under different ''Topic'' fields, with timespan 2008-2018, in a total of 103 articles. The following filters were then applied: business, management, communication, engineering, psychology and multidisciplinary sciences, narrowing the sample to 65 articles. In a third stage of the research, the abstracts of the research sample were analyzed. Articles non-business related, such as those related to medicine or health care, where discarded. Those identified as most relevant to the topic where to be analyzed in greater depth, in a total of 11 articles. However, three articles were not available for research, therefore, discarded. As posed by Morosan and Bowen (2017), while the matching of keywords, title and abstract are essential in determining relevance, the full text of the articles is the most critical element for the analysis. The articles sample was analyzed in the light of five out of seven criteria used by Koll, Wallpach, and Kreuzer (2010) in a multi-method evaluation. The criteria were: type of knowledge produced; diagnostic potential; actionability of the results, resource intensity and comparability.

3.1 Method evaluation and discussion

The analysis is summarized in the forth-coming Figure 1.

According to Mozzato and Grzybovski (2011), the utilization of software, for both quantitative or qualitative analysis, is a way of facilitating and validating the results of a research using the content analysis technique. Three out of eight studies relied on a software for such. Two studies (Wang et al., 2015; Hurwitz et al., 2018) relied on the software aid for extracting the data (data collection software).

Regarding the method discussion, the first question posed by Koll et al. (2010) as methodological evaluation criteria is how much and what **type of knowledge** does the method produce? According to Morosan and Bowen (2017), the content analysis allowed for an overall dynamic direction of the industry. The sole use of content analysis produced insightful results (Wang et al., 2015; D. Kim & S. Kim, 2017; Morosan & Bowen, 2017; Jafarzadeh-Kenarsari & Pourghane, 2017; Hurwitz et al., 2018), but some researches referred to a multi-method approach to analyze the phenomenon through different facets (Luo, Lee, Mattila, & Liu, 2012; Hüseyinoğlu, Özge, Galipoğlu, & Kotzab, 2017; Hampshire, 2017).

As per the method's **diagnostic potential**, the sample articles presented a richness of results. Applying content analysis, researches may uncover the current value and main lacunae of a theoretical base, such as Morosan and Bowen (2017) studying the online shopping behavior in the hotel industry. For instance, when analyzing mobile purchasing, they could spot some lacunae in systematic study of personalization using today's tech tools. At the same time, the authors could access the main topics regarding mobile purchasing in the hospitality industry. The content analysis demonstrated to be rich in providing analytical perspectives. Content analysis in mobile app reviews were used by D. Kim and S. Kim (2017) to explore consumers' attitudes and preferences for mobile travel apps. Application distribution platforms, known as mobile app stores, provide a space for users to submit feedback or ratings, which is very useful to both software providers and users in communication. It is a picture of users demands and whether the app achieves such. The authors applied content analysis to specify the status of mobile technology in tourism by extracting keywords in 1.175 patents, 621 academic articles and 1870 news articles. To deduce category with meaning from this large amount of data, they relied on the software T-LAB, that analyzes the data using lexical units and content units. Therefore, deduction of concepts and themes was performed using automatic coding based on mathematical algorithms. With the help of the software, the researches could arrive at word clustering, which ultimately lead to the identification of hot topics within both industry and academy, such as "location-aware recommender system for tourism mobile commerce" or "smartphones become pocket travel agents for growing number of Americans" (D. Kim & S. Kim, 2017, p. 23). In order to ensure credibility, dependability, transferability, and confirmability, Jafarzadeh-Kenarsari and Pourghane (2017) used a sampling method with maximum variation; member checking by some participants and provided a detailed description of the study process. Their study provided a number of insights related to smartphone usage, such as disorders derived from its overuse. To ensure the same four criteria required for trustworthiness in qualitative research, Hüseyinoğlu, Özge, Galipoğlu and Kotzab (2017) also adopted triangulation of results to reduce the effect of researcher bias. Indeed, due to the debates about the validation of the method, researchers are advised to systematically detail the procedures adopted (Bardin, 2006; Mozzato & Grzybovski, 2011).

	Methodology	Context	Authors	Data source / Sample	Software
1	Content analysis	Food marketing to children	Hurwitz et al. (2018)	Mobile and web media content 20 apps, 16 Wii and Xbox games, 100 websites	Screen-capture software Camtasia 8 video-coding software Datavyu 1.04
2	Content analysis	Online purchasing in hotels	Morosan and Bowen (2017)	85 peer-reviewed articles	No
3	Content analysis and case study	Mobile banking services	Luo et al. (2012)	Semi-structured interviews with 80 non m-banking users from the United States, China, South Korea and Finland	NVivo9
4	Content analysis	Mobile technology and tourism	Kim and Kim (2017)	Study 1: International Patent Classification (IPC) codes / mobile technologies Study 2: texts of patents, journal articles, and news Study 3: mobile app consumer reviews	Study 1: Netminer, a social network analysis program Study 2: T-LAB program Study 3: Leximancer program, which utilizes relative frequency
5	Qualitative content analysis	Smartphones technology usage	Jafarzadeh-Kenarsari and Pourghane (2017)	32 Iranian bachelor degree students. Data were collected through 11 individual semi-structured interviews and 3 focus group discussions (5-8 students in each group)	No
6	Triangulated content analysis and non-parametric statistical tests	Social media, local and mobile commerce in omni-channel management strategy	Hüseyinoğlu et al. (2017)	Websites and mobile apps of 16 retailers from different product segments in Germany and Turkey	No
7	Survey with quantitative analysis and semi-structured interviews with content analysis	Mobile payments	Hampshire (2017)	101 questionnaires and 10 semi-structured interviews with UK consumers	No
8	Content analysis	Online user reviews of hotel apps	Wang et al. (2015)	6.110 customer reviews from eleven OTA apps and 10 hotel proprietary apps posted between June 2009 and December 2012	A computer program using the programming language C++ was designed to extract customer reviews of smartphone apps from iTune App Store

Figure 1
The method of content analysis in mobile

As per the method's **diagnostic potential**, the sample articles presented a richness of results. Applying content analysis, researches may uncover the current value and main lacunae of a theoretical base, such as Morosan and Bowen (2017) studying the online shopping behavior in the hotel industry. For instance, when analyzing mobile purchasing, they could spot some lacunae in systematic study of personalization using today's tech tools. At the same time, the authors could access the main topics regarding mobile purchasing in the hospitality industry. The content analysis demonstrated to be rich in providing analytical perspectives. Content analysis in mobile app reviews were used by D. Kim and S. Kim (2017) to explore consumers' attitudes and preferences for mobile travel apps. Application distribution platforms, known as mobile app stores, provide a space for users to submit feedback or ratings, which is very useful to both software providers and users in communication. It is a picture of users demands and whether the app achieves such. D. Kim and S. Kim (2017) applied content analysis to specify the status of mobile technology in tourism by extracting keywords in 1.175 patents, 621 academic articles and 1870 news articles. To deduce category with meaning from this large amount of data, they relied on the software T-LAB, that analyzes the data using lexical units and content units. Therefore, deduction of concepts and themes was performed using automatic coding based on mathematical algorithms. With the help of the software, the researches could arrive at word clustering, which ultimately lead to the identification of hot topics within both industry and academy, such as "location-aware recommender system for tourism mobile commerce" or "smartphones become pocket travel agents for growing number of Americans" (D. Kim and S. Kim, 2017, p. 23). In order to ensure credibility, dependability, transferability, and confirmability, Jafarzadeh-Kenarsari and Pourghane (2017) used a sampling method with maximum variation; member checking by some participants and provided a detailed description of the study process. Their study provided a number of insights related to smartphone usage, such as disorders derived from its overuse. To ensure the same four criteria required for trustworthiness in qualitative research, Hüseyinoğlu, Özge, Galipoğlu, and Kotzab (2017) also adopted triangulation of results to reduce the effect of researcher bias. Indeed, due to the debates about the validation of the method, researchers are advised to systematically detail the procedures adopted (Bardin, 2006; Mozzato & Grzybovski, 2011).

Another criterion concerns management guidelines, evaluating **how actionable** are the results provided by the method. According to Hurwitz et al. (2018), the content analysis' method has the power to attract attention from press and consequently set policy and industry agendas. Besides, such type of research provides insights into consumer behaviors that "could be feasibly converted into actionable managerial practices" (Morosan, & Bowen, 2017, p.29). Luo, Lee, Mattila, and Liu (2012) emphasized the use of content analysis in semi-structured interviews in a bid to provide m-banking decision-makers scientific implications regarding m-banking inhibitors, complementing what had been pursued by previous quantitative methodological approaches. The authors also believed that the results could help develop better systems meeting the requirements of current non-adopters. Jafarzadeh-Kenarsari and Pourghane (2017) also emphasized that the research results regarding smartphone usage can assist in guiding the choices of families and education policy makers.

The fourth criterion involves **resource intensity**: how demanding is data collection, evaluation and interpretation? According to Krippendorff (2013), when content analysis entered social sciences, the amount of human effort required to collect, transcribe, and code textual data made it a time-consuming and labor-intensive effort. Despite the technological advances, it is still quite a resource intense method. Data collection can be quite exhausting in content analysis researches involving online media, due to the massive amount of information available (Hurwitz et al, 2018), which with no strict sampling criteria may lead to information overload. Luo et al (2012) collected 80 interviews lasting 15-20 min each. For the reliability and validity of this study, the researcher and another independent academician were involved in the

information transcription to ensure the documentations were correct. Besides, the written data of audio tapes were shown to the participants to confirm data accuracy. For manually coding in the qualitative content analysis process, Jafarzadeh-Kenarsari and Pourghane (2017) recommended reading the verbatim transcripts of the interviews several times to achieve the "sense of whole" (p. 2868). They condensed paragraphs, sentences, and words according to similarities, labelling with codes. In the view of their similarities and differences, they were merged int sub-themes and themes. Indeed, Franco (2008) recommend that the comparison and classification process imply the understanding of similarities and differences. Finally, Jafarzadeh-Kenarsari and Pourghane (2017) summarized the results in tables, one for each theme, containing sub-themes, codes and condensed meaning units.

Hüseyinoğlu et al. (2017) used manifest content analysis to identify the occurrences of a particular word or content in textual material and counted the features present in 16 retailers' social media, mobile apps and websites. The researches started with a qualitative approach to understand the interactions between certain topics but also applied non-parametric statistical tests for comparing the number of social, local and mobile commerce practices identified in the retailers.

Even when relying on software aid, content analysis in the mobile environment can be quite resource consuming. On their third study, D. Kim and S. Kim (2017) used content analysis based on text mining for accessing reviews from Trip Advisor and Google Trips, using Leximancer software, which "overcomes the potential bias and error of researchers of qualitative analysis while ensuring reliability and reproducibility of the results" (p. 24). Leximancer deduces the relative co-occurrence frequency of concepts. To increase reliability, the researchers also included a third-part expert in mobile development and two other software, Diction and SPSS. Nevertheless, a qualitative approach was needed for further investigation when the leading theme in Google Trips was "reservations", a functionality not present in the app. The customers wanted the functionality to be present in the future. As they put it, "a precise analysis requires more time" (p. 32), to interpret specific concepts with multiple meanings.

The data processing should ensure that some types of errors do not arise in sentiment analysis (D. Kim & S. Kim, 2017, p. 27). For instance, when interpreting words such as good and comfortable, because they can be listed serially with negative words (e.g., not good). If consumer reviews are to be the basis of the analysis, the presence of fake reviews can put the accuracy of the research at stake. That can be minimized by only crawling reviews that are indicated as helpful by users.

Last but not least, **comparability** is another criterion to be assessed by researchers: how easy and meaningful is comparison of results over time and across markets? According to Hurwitz et al. (2018), whenever possible, researchers using content analysis should aim at probability sampling to allow generalization of findings. This is to be preceded by clear sampling criteria establishment. Besides being very rigorous in the collection and data coding processes, Luo et al. (2002) relied on the NVivo9 software to arrive to a matrix coding that enabled comparison among four different demographic groups. The software also allowed researches to develop regional cluster maps that facilitated comparison. The authors aimed at "generalizability of the scientific findings" (Luo et al., 2002, p. 383). Plus, quantitative steps are especially important when trying to generalize results (Kohlbacher, 2006). On the other hand, in their qualitative content analysis research, Jafarzadeh-Kenarsari and Pourghane (2017) highlighted the importance of a detailed description of the study process to ensure its application by other researches. Nevertheless, they state clearly the lack of the transferability of their findings due to its qualitative nature. Like Hampshire (2017, p.354), whose mobile payments research does not have a statistically secure universalization of the findings, which negates the application of these research findings to other groups and to different social settings, as recommended by Lincoln and Guba (1985). In the qualitative research, the focus relies more

on the transferability than on the generalization of findings, being the difficulty of generalization inherent to the qualitative research, and thus cannot be highlighted as a limitation (Mozzato & Grzybovski, 2011).

4   Conclusions

In the mobile ambiance, the content analysis method has been applied to mobile app reviews, mobile app features, mobile media content, patents, news and academic articles and user interview data, both in a qualitative and quantitative approach. The software resource can be used for data extraction or for facilitating the coding.

If in the 60's the rise of computers gave the content analysis method a whole new perspective (Bardin, 2006), today mobile has been reshaping the data analysis possibilities. As the most intimate device we own, it not only changes the consumer journey, but also provides a whole new set of data unthinkable before, enlightening the path of consumer behavior comprehension, especially if the content analysis method is applied. For instance, the quantitative data provided by mobile expands the proof administration function of content analysis. In this ocean of data, Bardin's (2006) recommendations are not be missed: look for completeness, representativeness, homogeneity and relevance. Besides, when dealing with digital data, researchers shall be careful to avoid potential contamination of the sample, due to profiling and retargeting (Hurwitz et al., 2018).

Regarding how the content analysis method has been applied in mobile commerce studies, some highlights arose. Despite the increasing consumption of video, only one of the analyzed articles referred to a video-coding software. The sole use of content analysis produced insightful results, mainly regarding the overall direction of the field of study, but some researches referred to a multi-method approach to analyze the phenomenon through different facets. Triangulation of results was also used in an attempt to reduce the effect of researcher bias. As per the method's diagnostic potential, the systematic application of content analysis helped spotting customer insights, main topics and knowledge gaps to be addressed, in a thorough analytical perspective. Besides, the method was very useful in extracting meaning from large amount of data (D. Kim & S. Kim, 2017; Morosan & Bowen, 2017). Concerning actionability of the results, content analysis provides insights for managerial practices, industry agenda and policy making. As per resource intensity, in spite of technological advances, content analysis remains a resource consuming method, with intense data processing, coding and analysis to ensure scientific rigor. The comparability criterion was assessed by all sampled researches, whether aiming at probability sampling to allow generalization of findings in quantitative approaches (Luo et al., 2002; Kohlbacher, 2006; Hurwitz et al., 2018) or focusing on the transferability rather than on the generalization of findings in qualitative ones (Mozzato & Grzybovski, 2011; Jafarzadeh-Kenarsari & Pourghane, 2017; Hampshire, 2017).

Content analysis research based on mobile app reviews can be very useful in expanding the knowledge on consumer behavior. Medicine and health care, tourism and finance are the areas that concentrate the largest number of mobile application studies with content analysis articles. However, a whole array of themes related to consumer behavior via mobile applications can benefit from the insights provided by such methodology.

Challenges presented by the content analysis method in digital marketing researches are unique, yet not insurmountable. As Kohlbacher (2006) puts it, content analysis is still a young discipline. There is much to be learned about improved techniques, procedures, possible triangulation of results etc. making it a fruitful and inspiring avenue of research.

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