

Utilization of NLP in Marketing Communications

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Abstract

Words are part of almost every market interaction. Online reviews, customer service calls, press releases, marketing communications, and other interactions create a lot of textual data. But how do the best marketers use that data? This article provides an overview of automated textual NLP analysis and details how to use it to generate marketing insights. The author discusses how text can be a powerful tool both for prediction and for understanding (i.e., insight) and how NLP text can be used to unify marketing. The results show that textual analysis can unify many marketing components. While most marketing issues are interdisciplinary, the field is often fragmented. By engaging the skills and ideas from each of the marketing subfields, text analysis has the potential to help unify the field with a common set of tools and approaches.

Keywords

NLP; marketing;
text analysis



I. Introduction

Digitization of information has made a lot of textual data available. Consumers write online reviews, answer open survey questions, and contact customer service representatives (the contents of which can be transcribed). Companies write advertisements, send emails frequently, publish annual reports, and issue press releases. Newspapers have articles, movies have scripts, and songs have lyrics. By some estimates, 80%–95% of all business data is unstructured, and most of that unstructured data is text. (Gandomi, 2015)

These data have the potential to explain the behavior of consumers, companies, and markets, as well as society in general. But, by itself, all this data is just—data. For data to be useful, researchers must be able to extract underlying insights—to measure, track, understand, and interpret the causes and consequences of market behavior.

This is where the value of automated textual analysis comes in. Automated textual analysis is a computer-aided methodology that allows researchers to break free from the restraints of measurement, such as scales and written questions, and to measure the information contained in textual data as it is, naturally occurs. Given these benefits, the question is no longer whether to use automated text analysis but how this tool can best be used to answer interesting questions.

This journal provides an overview of using automated text analytics for marketing insights. Methodologically, text analysis approaches can describe "what" was said and "how" was said, using qualitative and quantitative questions with varying degrees of human involvement. These approaches consider individual words and expressions, their linguistic relationships within documents (interdependencies within texts) and across documents (interdependencies between texts), and the more general topics covered in texts. Techniques range from computerized word counting and the application of dictionaries to

supervised or automated machine learning that helps infer the psychometric and substantive properties of texts.

In this growing domain, it is important to look at the contributions of research. First, . illustrates how text data can be used for prediction and understanding, to gain insight into who produced the text, and how it can affect the people and organizations that consume it. Second, . provides a how-to guide for those new to text analysis, detailing the main tools, pitfalls, and challenges that researchers may face. Third, . offers a broad set of research propositions relating to the use of text as a means of understanding meaning-making in markets with a focus on how customers, companies, and society interpret or understand market interactions, relationships, and themselves. While the previous text analysis treatment has looked specifically at consumer texts. (Humphreys, 2017) Social media communication or process. aims to provide a framework for incorporating text into marketing research at the individual, corporate, market and community levels. Out of necessity, approach . includes a broad range of textual data sources (e.g., user-generated content, annual reports, cultural artifacts, government texts). (Suherman Kusniadji, 2016)

Fourth, and most importantly, . discusses how text analysis can help “unify tribes”. As a field, part of the value of marketing is its interdisciplinary nature. Unlike core disciplines such as psychology, sociology, or economics, the marketing discipline is a large marquee that allows researchers from different research traditions and philosophies (e.g., quantitative modeling, consumer behavior, strategy, consumer culture theory) to come together to study related questions. (Moorman, 2019) But in reality, the field often appears fragmented.

However, text analysis can unite the tribes. Not only does it involve skills and ideas from each of these areas, doing it well requires such integration as it borrows ideas, concepts, approaches, and methods from each tribe and combines them to achieve insights. Thus, the approach also adds value to each tribe in a way that may not be possible.

II. Research Method

The research method used in this study is the research method library (Library Research). Study library is one method qualitative research that places the research was carried out in the library, with documents, archives, and other types of documents as research material (Prastowo, 2012). Zed (2008) argues that the method librarianship is not just a business read and record literature or books as they are often understood many people during this time. bibliography method is a series of related activities with library data collection methods, read, record and manage research material.

III. Results and Discussion

3.1 Used for prediction or understanding (ie, predicting something or understanding what causes something)

Language can be defined as a set of rules or a set of symbols in which symbols are combined and used to convey information or broadcast information. Since all users may be inexperienced in machine-specific languages, Natural Language Processing (NLP) caters for users who do not have enough time to learn a new language or achieve perfection in it. In fact, NLP is a channel of Artificial Intelligence and Linguistics, aimed at making computers understand statements or words written in human language. It appears to facilitate the user's work and to fulfill the desire to communicate with computers in natural language, and can be classified into two parts namely Natural Language Comprehension or

Linguistics and Natural Language Generation .which develops tasks for understanding and generating text. Linguistics is the science of language which includes phonology which refers to sound, morphology of word formation, syntax of sentence structure, semantic syntax and pragmatics which refers to understanding. Noah Chomsky, one of the first twelfth century linguists who initiated the theory of syntax, marks a unique position in the field of theoretical linguistics because he revolutionized the field of syntax. (Netzer, 2012)

In the existing literature, most of the work in NLP is done by computer scientists while various other professionals also show interest such as linguistics, psychologists, and philosophers, economics, marketing etc. One of the most interesting aspects of NLP is gaining knowledge. of human language. The field of NLP is concerned with various theories and techniques related to natural language problems in communicating with computers. Some of the NLP tasks researched are Automated Summarization (Automaticsummarization generates an understandable summary of a set of texts and provides a summary or detailed information of the text of a known type),Joint Reference Resolution (Shared reference resolutionrefers to a sentence or a larger set of text that is determine all the words that refer to the same object), Discourse Analysis (Discourse analysisrefersto the task of identifying the discourse structure of connected texts i.e. the study of texts in relation to social contexts), Machine Translation (Machinetranslationrefers to the automatic translation of text from one language to another). others), Morphological Segmentation (Morphological segmentationrefersto the breakdown of words into morphemes that contain individual meanings), Named EntityRecognition(NER) is used for extracting information to recognized name entities and then classifying them into different classes), Recognition Optical Characters (Opticalcharacter recognition(OCR) is used for automatic text recognition by translating printed and handwritten text into a machine-readable format), Part Of Speech Tagging (Part of speech taggingdescribes a sentence, specifying the part of speech for each word). (Netzer, 2012)

Some studies such as (Bollen, Mao, and Zeng 2011; Tirunillai and Tellis 2012) Whether focusing on individual, company, or market level outcomes, the goal is to predict with the highest degree of accuracy. Such jobs often use a lot of textual features and use machine learning or other methods to combine these features in a way that achieves the best predictions. The main difficulty involved with using text for prediction is that text can generate hundreds and often thousands of features (words). all of which are potential predictors of the desired outcome.

In some cases, the number of predictors is greater than the number of observations, making traditional statistical prediction models largely impractical. To solve this problem, researchers often use machine learning-type methods, but overfitting needs to be carefully considered. In addition, inference with respect to the role of each word in the prediction can be difficult. Methods such as feature importance weighing can help extract some inference from these predictive models.

Other studies are mainly interested in using text for comprehension. For example, (Packard and Berger 2017). (Manchanda, 2015) Whether focusing on individual, company, or market level outcomes, the goal is to understand why or how something happens. Such work often involves examining only one or a small number of textual features or aspects related to the underlying psychological or sociological processes and aims to understand which features drive the results and why.

One of the challenges of using textual data for understanding is drawing causal inferences from observational data. As a result, work in this area can supplement field data by experimentation to allow key independent variables to be manipulated. Another

challenge is interpreting relationships with textual features. For example in research, (Packard and Berger 2019), for example, but this relationship alone does not necessarily explain why this is the case; Second person pronouns can indicate several things. As a result, deeper theory, examination of the relationships observed in previous research, or further empirical work is often needed.

Moreover, while most research tends to focus on prediction or understanding, some work integrates the two aspects. For example, studies (Netzer, Lemaire, and Herzenstein, 2019), for example, both use a variety of available textual features to predict whether a person will default on a loan and analyze the specific language spoken by people who are prone to default (e.g., the language spoken by liar).

3.2 NLP Can Be Used To Unify

Behavioral Marketing Economics and the Covid-19 turmoil has recently received praise for its many social or cognitive psychology applications as these researchers have demonstrated the phenomenon in the field. Given the concerns about replication, researchers have started looking for new tools that will enable them to ensure validity and increase relevance to external audiences. Previously, the use of secondary data was often limited to discussing the “what” but not the “why” (i.e., what people bought or did, but not why they did it). But text can provide a window into the underlying process. Online reviews, for example, can be used to understand why someone buys one item over another.

Such as research by, (Lee and Bradlow 2011), which helps marketers understand the series of considerations and journeys. Texts even help address the age-old problem of telling more than we can know for example in research, (Nisbett and Wilson, 1977). While people may not always know why they do something, their language often provides explanations beyond what they can consciously express.

This is of interest to more than just behavioral researchers. Text opens a large-scale window into the world of "why" in the field and does it in a scalable way. Quantitative modelers are always on the lookout for new data sources and tools to explain and predict behavior. Unstructured data provides a rich set of predictors that are often available, on a large scale, and can be combined with structured measures as dependent or independent variables. Text, through product reviews, user-driven social media activity and company-driven marketing efforts, provides real time data that can explain consumer needs/preferences.

It offers an alternative or supplement as research (LeCun, Bengio, and Hinton 2015) to traditional marketing research tools. In many cases, the text can be traced back to the individual, allowing a distinction between individual differences and dynamics. It also offers experiments where new methodologies from other disciplines can be applied.

Marketing strategy researchers want the logic by which a business can achieve its marketing goals and to better understand what influences organizational success. The main challenge for these researchers is to obtain reliable, generalizable surveys or field data about factors that lie deep within the culture and structure of the company or that are placed in the mental models and beliefs of marketing leaders and employees.

NLP text analysis offers an objective and systematic solution for assessing constructs in naturally occurring data (e.g., letters to shareholders, press releases, patent texts, marketing messages, conference calls with analysts) that may be more valid. Likewise, marketing strategists often struggle with valid measures of a company's marketing assets, and the text may be a useful tool for understanding the nature of customer, partner, and employee relationships and the strength of brand sentiment. For example, research (Kübler,

Colicev, and Pauwels, 2017) uses dictionaries and supports vector machine methods to extract sentiments and relate them to consumer mindset metrics.

Scholars drawn from anthropology and sociology have long examined texts through qualitative interpretation and content analysis. Consumer culture theory-oriented marketing researchers are primarily interested in understanding the underlying meanings, norms, and values of consumers, companies, and markets in the marketplace. Text analysis provides tools for measuring qualitative information to measure change over time or make comparisons between groups. (Bambang Joko Priyono, 2012)

Sociology and anthropology researchers can use automated text analysis to identify important words, find themes, relate them to text segments, and examine common expressions in context. For example, to understand consumer taste practices, For example research, (Arsel and Bean, 2013), uses text analysis to first identify how consumers talk about different taste objects, actions, and meanings in their textual datasets (comments on websites/ blog) before analyzing the relationship between these elements using interview data.

For marketing practitioners, textual analysis unlocks the value of unstructured data and offers a hybrid between qualitative and quantitative marketing research. Like qualitative research, it is rich, exploratory, and can answer “why”, but like quantitative research, it benefits from scalability, which often allows statistical modeling and testing. Textual analysis allows researchers to explore open-ended questions for which they do not know various possible answers a priori. With text, scholars can answer questions they didn't ask or for which they didn't know the exact outcome measure. (Morissan, 2010)

Rather than imposing on participants a specific scale or set of outcomes to choose from, for example, marketing researchers can ask participants broad questions, such as why they like or dislike something. Importantly, while text analysis offers opportunities for various research traditions, such opportunities are more likely to be realized when researchers work across traditional subgroups. That is, the benefits of computer-aided text analysis are best realized if we include quantitative and positivist content analysis and qualitative and interpretive discourse analysis. Quantitative researchers, for example, have the skills to build precise statistical models, but they can benefit from the ability of behavioral and qualitative researchers to relate words to underlying psychological or social processes as well as marketing strategy researchers' understanding of the drivers of organizational activity and corporate marketing performance. . This applies to all groups.

Based on that to actually extract insights from textual data, one must have interpretive skills to understand the meaning of words, behavioral skills to relate them to underlying psychological processes, quantitative skills to build appropriate statistical models, and strategy skills to understand what they mean. these findings for action and results are firm.

IV. Conclusion

Communication is an important aspect of marketing which includes communication between organizations and partners, businesses and consumers. Marketers are well positioned at the interface of consumers, companies, and organizations to leverage and advance tools to extract textual information to address some of the key issues facing businesses and society today, such as the spread of misinformation, the spread of technology, and the role of marketing in society. Marketing offers an invaluable perspective that is critical to this conversation, but only by taking a broader perspective, solving theoretical and methodological problems, and engaging with other disciplines.

References

- Arsel, Zeynep, Bean, Jonathan (2013), "Taste Regimes and Market-Mediated Practice," *Journal of Consumer Research*, Vol 39, No 5
- Bambang Joko Priyono. (2012), Tesis, Strategi Komunikasi Pemasaran, LBPP LIA Mercu Buana
- Bollen, Johan, Mao, Huina, Zeng, Xiaojun (2011), "Twitter Mood Predicts the Stock Market," *Journal of Computational Science*, Vol 2, No 1
- Gandomi, Amir, Haider, Murtaza (2015), "Beyond the Hype: Big Data Concepts, Methods, and Analytics," *International Journal of Information Management*, Vol 35, No 2
- Hartmann, Jochen, Heitmann, Mark, Schamp, Christina, Netzer, Oded (2019), "The Power of Brand Selfies in Consumer-Generated Brand Images," working paper
- Humphreys, Ashlee, Wang, Rebecca Jen-Hui (2017), "Automated Text Analysis for Consumer Research," *Journal of Consumer Research*, Vol 44, No 6
- Kübler, Raoul V., Colicev, Anatoli, Pauwels, Koen (2017) "Social Media's Impact on Consumer Mindset: When to Use Which Sentiment Extraction Tool," *Marketing Science Institute Working Paper Series 17*
- LeCun, Yann, Bengio, Yoshua, Hinton, Geoffrey (2015), "Deep Learning," *Nature*, Vol. 8, No 2
- Lee, Thomas Y., Bradlow, Eric T. (2011), "Automated Marketing Research Using Online Customer Reviews," *Journal of Marketing Research*, Vol 48, No 5
- Manchanda, Puneet, Packard, Grant, Pattabhitamaiah, A. (2015), "Social Dollars: The Economic Impact of Consumer Participation in a Firm-Sponsored Online Community," *Marketing Science*, Vol 34, No 3
- Moorman, Christine, van Heerde, Harald J., Moreau, C. Page, Palmatier, Robert W. (2019), "JM as a Marketplace of Ideas," *Journal of Marketing*, Vol 83, No 1
- Morissan. (2010). Periklanan, Komunikasi Pemasaran Terpadu. Bandung: Prenada Media Group
- Netzer, Oded, Feldman, Ronen, Goldenberg, Jacob, Fresko, Moshe (2012), "Mine Your Own Business: Market-Structure Surveillance Through Text Mining," *Marketing Science*, Vol 31, No 3
- Nisbett, Richard E., Wilson, Timothy D. (1977), "Telling More Than We Can Know: Verbal Reports on Mental Processes," *Psychological Review*, Vol 84, No 3
- Packard, Grant, Berger, Jonah (2019), "How Concrete Language Shapes Customer Satisfaction," working paper
- Prastowo, Andi (2012). Metode Penelitian Kualitatif dalam Prespektif Rancangan Penelitian. Yogyakarta: Ar-Ruzz Media
- Suherman Kusniadji, (2016), "Strategi Komunikasi Pemasaran Dalam Kegiatan Pemasaran Produk Consumer Goods (Studi Kasus Pada PT Expand Berlian Mulia Di Semarang)". Vol. 8, No. 1
- Zed, Mestika, (2008). Metode Penelitian Kepustakaan. Jakarta: Yayasan Obor Indonesia.