

Sentiment Analysis for Online Shopping in the UAE: A Case of Business Analytics

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Abstract

The massive acceptance of blogs and social media unlocks the access for consumers to express their opinions and views about the happiness or disappointment of online shopping. Sentiments of blogs and social media are instantaneous and economically feasible than the traditional technique of collecting responses. Consumers in the UAE are prone to use blogs and social media for giving feedback and responses about the products purchased online. The research thus finds its importance in the context and uses two research hypotheses to recognize the applicability of blogs and social media as a tool for online responses. Three industry sectors, electronics, fashion, and travel, are taken in the research for comprehensive analysis. Overall, 1200 responses are collected from 4 blogs (based on the sector), and another 1200 responses are from 4 social media channels (Facebook, Twitter, YouTube, and Instagram). The responses are analyzed using the QDAP (Quantitative Discourse Analysis Package) dictionary in R programming.

Keywords: QDAP, s-commerce, sentiment analysis, t -test, online-based-brand community (OBBC), two-tailed hypotheses test
JEL: M30, L82

Introduction

With the rapid expansion of web 2.0, a large volume of reviews on blogs and social media are generated. These reviews are advantageous for individuals before buying any products online. Blogs and social media has feasibly become a mutual communication medium between companies and consumers owing to its low cost (Ajina, 2019) and massive reach (Appel et al., 2020). The shift to user-driven technologies like blogs and social media according to (Smith, 2009) ushered in a revolution. In terms of user-generated content, global community, and consumer opinion publication, blogs and social media has steered in a revolution. (Dwivedi et al., 2021) states that consumer behavior and company practices have both altered as a result of the blogs and social media's use. Organizations may benefit from social and digital marketing by lowering expenses, increasing brand recognition, and increasing revenues. According to (Busalim et al., 2019), the emergence of blogs and social media has transformed consumer behavior, and the s-commerce (social commerce) setting has become a crucial competitive advantage for organizations aiming to develop a customer-centric business. (Constantinides & Holleschovsky, 2016) mentions that online consumer reviews and recommendations and peer opinions play an increasingly growing role in the consumer decision making process. The authors further states that giving significance of user-generated content on business sales and profitability, monitoring and often responding to customer reviews has become a big decision-making task as well as a significant reputation management concern for businesses. Companies are in need to discover consumer review platforms, understand their characteristics, and regularly monitor their influence on consumer purchase choices in order to respond quickly to consumer reviews. Consumers are increasingly using online resources (e.g., social media, blogs, etc.) to communicate their thoughts about the products and services they consume, according to Huete-Alcocer (2017). According to (Kapoor et al., 2018), social media sites are already thoroughly integrated in our everyday lives, are driven by user-generated content, and have a significant influence on purchasing/selling behaviors. Organizations are expanding their investment in social media marketing (SMM), according to (Keegan & Rowley, 2017), and evaluating such tactics is becoming increasingly vital to obtain a sense of consumer behavior.

As a result, the study investigates the influence of blog and social media evaluations on customer purchasing behavior in the UAE. The data contains comments curated from a variety of blogs (as used by UAE businesses) and four

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social media sites. We gathered 300 new comments from these platforms, bringing the total number of evaluations to 2400 across three industries: electronics, fashion, and travel. The sentiment analysis package and QDAP are used to calculate the data acquired using the R programming language. Between -1 and +1, the software translates the reviews (qualitative data) into quantitative data. All of the comments are analyzed independently for each sector in the package, and combined results are created for approval or rejection (for the two hypotheses).

The components of the paper are as follows: In "Review of Literature" of the literature study, the usage of blogs and social media reviews for online shopping in the UAE is examined in depth. "Conceptual Framework" discusses the conceptual framework, which comprises two independent and one dependent variable for data analysis. "Data Analysis" covers the data analysis section, which includes the mathematical formulation and discussion of the results. The study's findings are provided in "Outcomes for Blogs and Social Media", which examines the effects of three different sectors for blogs and social media. The study's findings, result discussion, and limitations are all included in "Conclusion".

Review of Literature

Blogs and Social media are rapidly and fundamentally changing the shopping scenario. The section considers blogs and social media tools for reviews and feedback for online shopping in the UAE.

The review of literature is distributed into three sections:

- The first section covers the literature concerning electronic commerce in UAE (Electronic Commerce in the UAE)
- The second section mentions blogs and social media role in generating customer responses are composed. (Blogs and Social Media and its Role in Generating Consumer Responses)
- The third part collects the literature mentioning how online companies in the UAE use social media and blogs. (Use of Social Media by Companies in the UAE)

Electronic Commerce in the UAE

Electronic Commerce in the UAE is an upcoming industry. (Fintechnews Middle East, 2019) The Google report stated that electronic commerce in UAE is projected by 31% annually to reach \$8.9 billion by 2022, depending on the new players' entry into the UAE market. (Saxena, 2019) studied that in UAE, only 39% of respondents have done shopping online. (Mansoor, 2020a) publishes an article stating an interesting fact about electronic commerce penetration in the Middle East. The study states that electronic commerce penetration in Middle East countries is higher than in mature electronic commerce countries such as the U.S. and China, with 64.5% compared to 54.5%. (Makkawi, 2020) studied 150 electronic commerce companies operating in UAE and gave the following outcomes:

- 24% of visitors spend less than one minute on electronic commerce sites in the UAE.
- 22% of visitors visit just one page on a site. Also, electronic commerce companies in the UAE invest in paid campaigns, social campaigns, SEO, and content creation.

(The National, 2020) published the news that Dubai recorded 83% growth in the number of electronic commerce business licenses issued in the first half of 2020. (Mansoor, 2020b) stated that nearly 2000 businesses in UAE are looking to develop electronic commerce capabilities as part of the Dubai Electronic Commerce strategy.

Blogs and Social Media and its Role in Generating Consumer Responses

(Wang & Chaudhry, 2018) conducted the study that examines the impact of online reviews on blogs and social media for travel websites. The authors find that negative reviews impact businesses as compared to positive reviews. (Noureddine & ZeinEddine, 2018) stated that companies use blogs and social media as a medium for brand connection with consumers. (Poturak, 2019) mentions that social media forms a central part of companies' marketing strategies and influences brand equity and purchase intention. (Jibril et al., 2019) mentions the online-based-brand community (OBBC) role through social media platforms (SMP) and online customers' purchasing attitudes. The study depicted that OBBC on the social media platform (SMP) positively influences customer-brand engagement and user-brand relationship. (Xhema, 2019) states that companies should focus on customer engagement and online presence to serve customers and satisfy their needs. (Mayrhofer et al., 2020) studied the impact of advertisements, brand posts, and user-generated content on purchase intention and found that content generated by consumers through blogs and social media led to higher purchase intention than advertisements and brand posts. (Pribanic, 2020) states that blogs and social media are

essential for companies to build their brand. (Zaki Ahmed & Rodríguez-Díaz, 2020) mentions that sentiment analysis is essential for analyzing customer reviews on social media and helps companies design and implement communication strategies. (Bilal et al., 2021) states that social media consumer reviews have become a popular source of information that influences customers' purchasing decisions.

Use of Social Media by Companies in the UAE

It is a no-brainer that companies need to be on social media to engage with customers wherever they can, and UAE is no different. The section references literature connecting to social media use by companies in the UAE. (Nuseir, 2018) The author studied the advantages of blogs and social media for companies in the UAE. The discussion and awareness state that reviews on blogs and social media could intensify companies' performance by boosting business, extending the market base, better customer satisfaction, and after-sales service. (Rousseau, 2019) surveyed 1000 customers who buy online in UAE in 2019. The authors state that 57% of the consumers buy online because of reviews on blogs and social media. (Radcliffe & Abuhmaid, 2020) highlighted the growing importance of social media for shopping in the UAE. The author states that Twitter has emerged as a leading platform for marketing in the UAE.

Through literature, we observe that blogs and social media interactions are critical to understanding consumer responses. Still, the companies in UAE cannot tap the advantages of the relationship. Therefore, this study aims to recognize the impact of reviews on blogs and social media on online consumer shopping.

Table 1 gives the detail listing of the research gap, question and objective that is carried out in the study.

Table 1. Research Gap, Questions and Objectives for the Study

Research Gap	Research Questions	Research Objectives
There appears to be a paucity of literature on the impact of reviews on online shopping in the UAE.	RQ1: Does the reviews on social media influences the online purchase intention?	RO1: To study the influence of reviews of social media for online shopping in the UAE.
	RQ2: Does the reviews on various blogs influences the online purchase intention?	RO2: To study the influence of reviews of blogs for online shopping in the UAE.

Conceptual Framework

The use of blogs and social media for consumer reviews is one of the significant factors influencing consumers' purchase decisions. The reviews on blogs and social media carry adequate power to attract or drive away potential consumers. As shown in Figure 1, the proposed conceptual framework for analyzing consumer reviews takes input data from blogs and social media to evaluate overall consumer response.

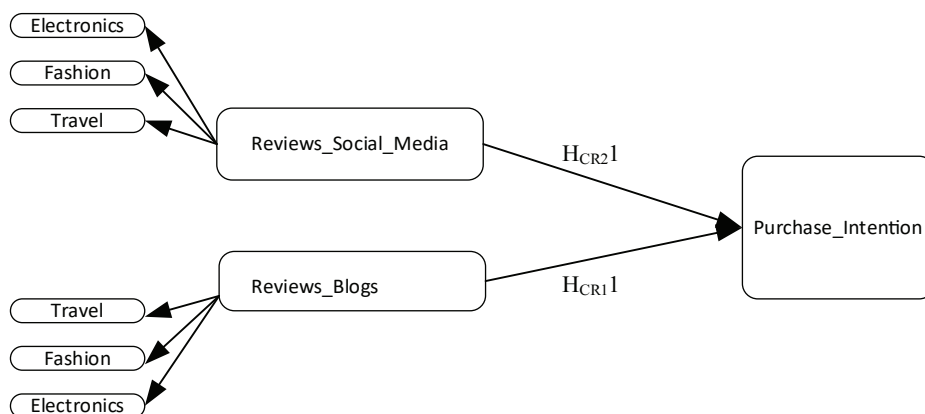


Figure 1. Proposed Conceptual Framework

As mentioned in Figure 1, Reviews_Social_Media and Reviews_Blogs are two independent variables and Purchase_Intention is the dependent variable. For the research purpose, three different industry segments from UAE, electronics, fashion, and travel, are taken for social media and blogs.

Hypotheses Statements

The two research hypotheses identified for the study are:

Hypothesis 1:

H_{CR1}: Consumer reviews through blogs generate a positive response.

Hypothesis 2:

H_{CR2}: Use of social media by companies generates positive sentiments.

Sampling Design

For the research purpose, 1200 reviews from blogs and social media are taken. Figure 3 illustrates the acceptable sample size, and Sample Size for the research is:

Table 2. Sample Size

	Social Media	Blogs
Sample Size	1200	1200

Data Collection

Table 3 mentions the sectors, companies selected for collecting consumer reviews for blogs and social media. The figure also mentions the blogs (for each sector) and social media channels for data collection.

Table 3. Sector, Companies, Blogs, and Social Media for Data Collection

Sector	Companies Selected	Blogs	Social Media
Electronics	Amazon.ae, Noon.com	Trustpilot, Reviews.io, Mamma, and dedicated companies blog	Facebook, Twitter, YouTube, Instagram
Fashion	Gap, Zara	Trustpilot, Sitejabber, Mouthshut, and Mamma	
Travel	Etihad Airways, Emirates Airlines	Trustpilot, Kayak, Skytrax, and Mouthshut	

Data Analysis

For data analysis, the sentiment score for the consumer reviews uses the SentimentAnalysis package of R. To generate the sentiment score; the QDAP dictionary is used, as given in Figure 2.

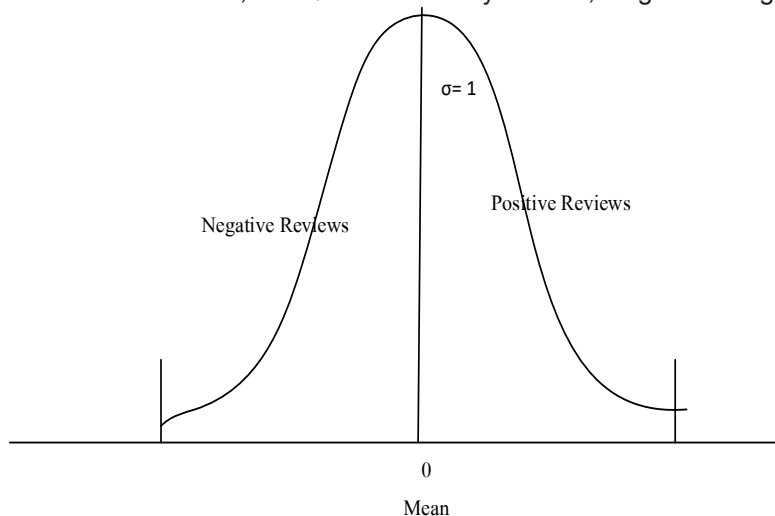


Figure 2. QDAP Dictionary Outcomes for Sentiment Analysis

The QDAP dictionary generates the sentiment score in the range $[-1, +1]$ with a mean of 0. The output follows a standard normal distribution with a mean of 0. As mentioned in Figure 3.7, the range $[0, 1]$ is a positive review, range $[-1, 0]$ is negative review and $[0]$ is neutral.

Computation of t -test

At first, the mean and standard deviation are calculated. The mean and standard deviation are input to compute the t -value as given in equation 1.

$$t_value = \left[\frac{x - \mu}{\sigma / \sqrt{n}} \right] \quad (1)$$

As mentioned earlier, with mean=0, equation 1 is rewritten as given in equation 2

$$t_value = \left[\frac{x}{\sigma / \sqrt{n}} \right] = \left[\frac{m_data}{sd_data / \sqrt{100}} \right] \quad (2)$$

Computation of Consumer Responses for Blogs

The computation of consumer responses for blogs is on the calculation of t -value for electronics, fashion, and travel, individually. Equations 3 to 5 give average t -value for each of the blogs.

$$t_value_{Electronics} = \frac{[t_value_{TrustPilot} + t_value_{Reviews.io} + t_value_{Mamma} + t_value_{Others}]}{4} \quad (3)$$

$$t_value_{Fashion} = \frac{[t_value_{TrustPilot} + t_value_{Sitejabber} + t_value_{Mouthshut} + t_value_{Mamma}]}{4} \quad (4)$$

$$t_value_{Travel} = \frac{[t_value_{TrustPilot} + t_value_{Kayak} + t_value_{Skytrax} + t_value_{Mouthshut}]}{4} \quad (5)$$

Based on the three equations, the computation of consumer response for blogs is given in equation 6

$$t_value_{Blogs} = \frac{[t_value_{Electronics} + t_value_{Fashion} + t_value_{Travel}]}{3} \quad (6)$$

The t -value_{Blogs} is evaluated for a 95% confidence interval ($\alpha = 0.05$), t -critical = ± 1.96 for the two-tail test and $df = n - 1$. If t -value_{Blogs} $\leq \pm 1.96$, H_{CR1} is accepted, else rejected.

Computation of Consumer Responses for Social Media

The computation of consumer response for social media is based on the calculation of t -value for the four social media for electronics, fashion, and travel, respectively. Equations 7 to 9 give average t -value based on four social media.

$$t_value_{Electronics} = \frac{[t_value_{Facebook} + t_value_{Twitter} + t_value_{YouTube} + t_value_{Others}]}{4} \quad (7)$$

$$t_value_{Fashion} = \frac{[t_value_{Facebook} + t_value_{Twitter} + t_value_{YouTube} + t_value_{Others}]}{4} \quad (8)$$

$$t_value_{Travel} = \frac{[t_value_{Facebook} + t_value_{Twitter} + t_value_{YouTube} + t_value_{Others}]}{4} \quad (9)$$

Based on the three equations, the computation of consumer response for social media is given in equation 10.

$$t_value_{SocialMedia} = \frac{[t_value_{Electronics} + t_value_{Fashion} + t_value_{Travel}]}{3} \quad (10)$$

The t -value_{SocialMedia} is evaluated for a 95% confidence interval ($\alpha = 0.05$), t -critical = ± 1.96 for the two-tail test and $df = n - 1$. If t -value_{SocialMedia} $\leq \pm 1.96$, H_{CR2} is accepted, else rejected.

Outcomes for Blogs and Social Media

The section gives the outcomes of the reviews from blogs and social media. Overall, 1200 reviews are from the blogs and another 1200 from social media, respectively. The outcome is using a two-tailed t_{test}.

Consumer Responses from Blogs

Consumer responses through blogs are collected for three sectors in the UAE. The overall t_{value} is then used to test hypothesis 1(H_{CR1}1), which is that consumer reviews through other resources (blogs) generate a positive response. Table 4 give details of the overall analysis of reviews on blogs.

Table 4. Overall Analysis of Reviews on Blogs

Blogs					
Electronics	Trustpilot	Reviews.io	Mamma	Others	Overall
μ	0.03	0.03	-0.02	0.09	0.03
σ	0.04	0.26	0.32	0.31	0.23
t _{value}	0.63	0.97	-0.72	2.78	0.92
Fashoin	Trustpilot	Sitejabbar	Mouthshut	Mamma	Overall
μ	-0.05	0.01	0.16	0.01	0.03
σ	0.38	0.53	0.40	0.46	0.44
t _{value}	-1.19	0.16	4.11	0.28	0.84
Travel	Trustpilot	Kayak	Skytrax	Mouthshut	Overall
μ	-0.01	0.30	0.04	0.09	0.11
σ	0.42	0.32	0.41	0.42	0.40
t _{value}	-0.20	9.28	1.05	2.12	3.06

Overall Evaluation of Consumer Responses on Blogs

The overall evaluation of consumer response on blogs is based on equation 6. The t_{value}_{Blogs} is evaluated for a 95% confidence interval (α = 0.05), t_{critical} = ±1.96 for the two-tail test and df = 99. If t_{value}_{Blogs} ≤ ±1.96, H_{CR1}1 is accepted, else rejected.

Using equation 6, the t_{value}_{Blogs} = 1.605981, were 1.605981 ≤ ±1.96; thus, H_{CR1}1 is accepted, indicating that consumers use different blogs for getting responses and feedback to make online purchases in the UAE.

Consumer Responses from Social Media

Consumer responses through social media are composed of three UAE sectors (Electronics, Fashion, and Travel) used for testing hypothesis 2 (H_{CR1}2). Table 6 give details of the overall analysis of reviews on social media.

Table 6. Overall Analysis of Reviews on Social Media

Social Media					
Electronics	Facebook	Twitter	YouTube	Instagram	Overall
μ	-0.02	-0.08	-0.18	0.07	-0.05
σ	0.32	0.28	0.35	0.42	0.34
t _{value}	-0.73	-2.79	-5.09	1.70	-1.73
Fashoin	Facebook	Twitter	YouTube	Instagram	Overall
μ	0.08	0.02	0.20	0.14	0.11
σ	0.49	0.52	0.38	0.58	0.49
t _{value}	1.61	0.38	5.40	2.36	2.44
Travel	Facebook	Twitter	YouTube	Instagram	Overall
μ	0.10	0.19	0.29	0.16	0.18
σ	0.54	0.35	0.34	0.45	0.42
t _{value}	1.79	5.57	8.41	3.62	4.85

Overall Evaluation of Consumer Responses on Social Media

The overall evaluation of consumer response on blogs in equation 10. Using equation 10, the t_{value}_{SocialMedia} = 1.852004, were 1.852004 ≤ ±1.96; thus, H_{CR1}2 is accepted, showing that consumers are reading comments and feedback on social media to make online purchases.

Conclusion

Our findings reveal that not only do reviews play varied roles in purchase decisions when it comes to online shopping in the UAE, but that reviews on blogs and social media are also crucial. Whereas reviews on blogs and social media have no impact on travel industry sales, reviews on social media have no impact on consumers. The study has certain limitations, such as the fact that our two samples come from the same nation (UAE) and that there is no method to distinguish between age and gender composition. We also confine ourselves to three sectors (Electronics, Fashion, and Travel) because these are the most common purchasing patterns in the UAE.

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