

A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil, Kurdistan, Iraq Vol. (8), No (3), Summer 2023 ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

#### The Impact of Social Media Advertising on Customer Performance Using Logistic Regression Analysis

#### Asst. Lect. Sami Ali Obed

Department of Statistics and Information, College of Administration and Economics, Salahaddin University, Erbil, Kurdistan Region, Iraq Sami.obed@su.edu.krd

#### Dr. Dlshad Mahmood Saleh

Department of Statistics and Information, College of Administration and Economics, Salahaddin University-Erbil, Iraq <u>dlshad.saleh@su.edu.krd</u>

#### Lect. Dashty Ismil Jamil

Department of Marketing, Lebanese French University, Kurdistan Region, Iraq Dashty@lfu.edu.krd

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#### ABSTRACT

The purpose of this study is to analyze the impact of emarketing on the situation of consumers Purchasing in Erbil, Kurdistan. It has been done quantitatively, employing straightforward random sampling. The data was collected through a survey of 340 social media users, who served as a sample using simple random sampling for selected these cases. The study variables include consumer purchase decisions as a dependent variable and social media advertising as an independent variable. As moderating variables, income, education, gender, age, and culture were all considered. The study's results show that social media advertising has a significant effect on consumers' purchase. Customers' wealth and education had little significant effect on the association between their consumers purchasing decisions and social media advertising, but gender, age, and culture of the consumers purchasing, source of income, and the COVID-19 pandemic (which has helped online shopping



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> grow) all have significant moderating effects on consumers purchasing and advertising. This groundbreaking study examines how social media advertising affects customer purchasing behavior by examining the situation of consumers in Erbil City. Moreover, the outcomes of the data analysis using the SPSS statistical tool and Microsoft Excel.

#### 1. Introduction

Social media, despite its being a new thing, has made a significant difference on personal minds. The number of social media followers is increasing daily, demonstrating the strength of this new trend. Social media is a term that everyone is familiar with today.

Nowadays, marketers and consumers are expanding their communication through the social network, a dynamic new medium. The most recent innovation in product promotion and customer communication is this. One of the social media platforms with the greatest growth, in particular, is Facebook, which encourages extensive free-form brainstorming among its users to form opinions. Several studies back the widespread use of the internet as a reliable information source because of its perceived reliability and ease of access (Barznji, 2018)

#### 2. Literature review

In order to get around the shortcomings of ordinary least squares (OLS) regression in handling dichotomous results, logistic regression was first developed in the 1970s. In the early 1980s, it was made available in statistical software. In epidemiological research, where the outcome variable is frequently presence, logistic regression has been regularly used.

Wright, R. E. (1995). Differenced between logistic regression and linear regression and the basic assumptions of logistic regression / use data from a hypothetical study to show how to interpret a logistic regression analysis is used primarily with dichotomous dependent variables, the technique can be extended to situations involving outcome variables with 3 or more categories (polytomous, or multinomial, dependent variables).



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Jiang .Y, et at Doe .K. (1996) To create a technique for separating malignant from benign clustered micro calcifications that uses computer-aided image feature extraction and analysis.

O'brien, S. a. (2004). The positive effect of social media advertising in maximizing consumer utility is reflected as well in the comparison of consumer surplus before and after the introduction of social media advertising.

Ahmed, R. (2016) Indicate that the best logistic model to estimate which is composed of significance parameters breast may be a sign that a woman has a chance of developing breast cancer.

#### **3- Hypotheses**

The five steps of the shopping experience recognition search for alternatives, evaluation of those choices, taking a decision, and analysis of that judgment influenced by social media advertising, which offers consumers free and easily accessible information (Field, 2009): (Tripepi, G.,Dekker, F.W. and Zoccali,2008)  $H_1$  Social media marketing has an impact on consumers' buying decision making.  $H_2$  The impact of social media marketing on consumer purchase behavior is moderated by the respondent's gender.

 $H_3$  The impact of social media advertising on user buying decisions is moderated by the respondent's age.

 $H_4$  The impact of social advertising media on consumer purchase behavior is influenced by the respondent's income.

 $H_5$  The impact of social media advertising on consumer buying habits is reduced by the respondent's educational level.

#### 4- Methodology

The purpose of the study framework was to address our hypotheses in the context of the market in Erbil. We used cross-tabulation, descriptive statistics and logistic regression analysis on the data gathered after selecting surveys as the primary mode of data collecting. Based on their significance and relevance to both people and businesses, we prioritized the questions that needed to be

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answered. The purpose of the questionnaire was to gather data and provide an answer to the main research question in the following categories.

- Do advertisements on social media impact consumers purchasing?
- Is the social media advertising content respectful of Erbil culture?

• Do demographic variables like gender, age, income, and level of education have a mediating impact on consumers' decisions to make purchases after seeing adverts on social media?

#### 5- Binary logistic regression

The link between a nominally scaled dependent variable and one or more independent variables, which may also be referred to as accompanying variables or independent variables and may be measured in any way.

In this situation, the analysis is known as a binary logistic regression. The analysis of the logistic regression refers to the statistical method used to evaluate and reconcile the connection among the binary dependent variable and one or more independent variables of any type. Ordinal categorical data can be analyzed using one of two primary groups of models: log linear and genuine (Binary and ordinal regression) models (Tripepi, G.,Dekker, F.W. and Zoccali,2008).

#### 5.1 Ratio and Odds

Ratio is a component of the total that has a direct correlation to probability. While chances are a means to assess the likelihood of something happening to the likelihood that it won't. Which:

$$Odds = \frac{p}{(1-p)} \dots (1)$$

e of event.

(p) is the probability of the event occurrence.

(1- p) is the probability of event that not occurred (Berne, 2010)

#### 5.1- Odds ratio

Is the ratio between the odds of a variable (QI) and the odds for another variable (Q), i.e., the odds ratio is equal to.



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$$OR = \frac{OddsQ1}{OddsQ2} = \frac{N_1}{N_2} \quad \dots (2)$$

Where,

OR is the Odds ratio.

Q1 and Q2 are the first and second Odds (Kleinbaum, D.G., Kupper, L.L. and Chambless, L.E, 1982)

#### 5.2- Logit

It is the natural logarithm of Odds, in which if No is a number of cases in one of the organizations and NI is one of the cases in the other organization, the:

$$Loglit = log\left(\frac{N_1}{N_2}\right) = ln(odds) \quad ...(3)$$

As aimed at, the (logit) in terms of probability, it is expressed as:

The logit function's primary use is to enable the use of linear regression when examining relationships with binary response variable (Mawlood, 2019)

#### 6- Wald Statistics

In order to test the null hypothesis, which states that the effect of the logit factor is not equal to zero, this statistic is used to evaluate the statistical significance of all of the logistic regression coefficients relating to each independent variable. The following equation determines how to calculate a Wald statistic (Field, 2009) (Harrell, F.E,2001).  $W = \left(\frac{b}{S.E_P}\right)^2$  ... (4)

#### 3- Ordinal Logit Model Fitting

A mean dependent model can indeed be fitted if the relationship between the levels of the ordinal dependent scales is determined, allowing numerical scores to be practically assigned to the dependent levels. The ordinal logistic regression model can be expanded to accommodate cases with more than two proceedings. Let's say the initial association that needs to be categorized is:

#### Where,

 $Y_i = X'\beta + \varepsilon \dots (5)$ 

Y<sub>i</sub> is the specific but undetected dependent variable X is the vector of independent variables.



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 $\boldsymbol{\beta}$  is the vector of Regression Parameter which we demand to estimate.

And  $\boldsymbol{\varepsilon}$  is the random error (Wright, R. E. (1995).

The Model fitting Information gives the -2 log likelihood (-2LL) values for the starting point and the last model and a chi-square to test the alteration between the -2LL for the two models. The goodness of fit statistics specified that the model fits much better than the location only model. From the detected and predictable frequencies, we can compute the typical Pearson and Deviance goodness of fit measures. The Pearson goodness of fit statistic is

$$x^{2} = \sum \sum (\frac{o_{ij} - E_{ij}}{E_{ij}})^{2}$$
.....(6)

The deviance measure is :

$$D = 2\sum \sum O_{ij} ln(\frac{O_{ij}}{E_{ij}})^2$$
.....(7)

Both of the goodness-of-fit statistics would be used only for models that have practically large predictable values in each cell. If we have a continuous independent variable or many categorical interpreters or some predictors with many values, we may have many cells with small expected values. There are several  $R^2$  like statistics that can be used to measure the strong point of the association between the dependent variable and the interpreter variables. They are not as advantageous as the  $R^2$  statistic in regression; subsequently their interpretation is not straight forward. Three commonly used statistics are

1-Cox and Snell  $R^2 = 1 - \left(\frac{L(\beta^0)}{L(\hat{\beta})}\right)^{\frac{2}{n}}$ 2-Nagelkerke  $R^2 = \frac{\text{Cox and Snell } R^2}{1 - L(\beta^0)^{\frac{2}{n}}}$ 3- McFadden's  $R^2 = 1 - \left(\frac{L(\hat{\beta})}{L(\beta^0)}\right)$ 

where,  $L(\hat{\beta})$  is the log-likelihood function for the model with the estimated parameters, and  $L(\beta^0)$  is the log likelihood with just the thresholds and n is the number of cases (Berne, 2010)(Kadir.D.H, k. a. (2022)).



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#### **3-** Results and Discussion

The data set for this study about the social media advertising has Effect on consumer behavior was collected in Erbil Government. The study community consists of the entire Governmental Erbil province for year (2021-2022), Using simple random sampling for selected these cases.

The data consisted of 370 cases have been collected, (370) forms were distributed at the end of November and recovered (340) forms excluded (30) forms for lack of validity for analysis, thus reaching the percentage of valid recovered forms of total distributed questionnaires (340) questionnaires (form), and the data was defined and entered into the computer to calculate the results of the analysis were obtained from the statistical packages (Excel) and (SPSS version 25).

#### **Descriptive statistics**

x1	Gender
x2	Age
x3	Place of living
x4	Nationality
x5	Marital status
x6	Educational degree
х7	Source of income
x8	Monthly income (family or self)
x9	Have you ever bought any goods through Online shops
	after seeing online ads?
x10	How many hours do you use social media on a week?
x11	Do you trust online shopping?
x12	Does online shopping facilitated your work?
x13	Does online shopping save you time?
x14	Does online shopping helps you to avoid the pandemic?
x15	Does the Covid 19 pandemic helped the online shopping
	to grow?
x16	Does the type and quality of the goods affect the online
	market user?
x17	Do merchants get the benefits of shopping online and
	staying in touch with their customers?

#### Table (1): Definition of variables



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x18	Does the item you received was the same that you ordered?					
x19	What worries you the most about online shopping?					
x20.1	Which social media platform you use for online shopping?					
	facebook					
x20.2	instagram					
x20.3	Snap chat					
x20.4	Other social media					
x21	How do you like to pay while you are buying something					
	from online?					
x22	In your opinion, is the Kurdish community ready for					
	Internet customers?					



Figure (1) Descriptive statistics of Gender

The cross-tabulation of the customer's gender and choice to buy after viewing an internet advertisement is shown in Figure 1. We can observe that 119 Female out of 193 respondents claimed to have bought a produce afterward viewing an online advertisement on social media, whereas 74 male out of 193 respondents of male) made the same claim.

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Figure (2): Descriptive statistics for Age Classes

Figure 2 demonstrates that there are some differences in the buying decisions made by consumers of different ages after viewing an internet advertisement. Ages 21 to 25 have a high level of responsiveness to social media advertising. This suggests that these age groups are adept at utilizing technology and have more purchasing power than the older group. It's important to note that the age range of 21 to 25 is the one that social media marketing may affect the most. Almost everyone in this age and has their own cheap, however for those between the ages of 16 and 20 who are primarily students and unemployed, this component is more or less unavailable. However, compared to younger age groups, those who are 25 and older naturally have more obligations and less interest in spending extended amounts of time online and using social media. People between the ages of 21 and 25 are therefore the demographic most using social media advertising because they have both the financial means and the desire to spend more time online.





Figure (3): Descriptive statistics of Income level in Erbil city

According to Figure 3, persons with salaries exceeding 750 000 ID were more likely (43.6%) than the other categories with lower salaries to kind a buying founded on online marketing. It has also been discovered that people with wages of 500,000 ID or less are less inclined to buy something after seeing an advertisement on social media.





Figure (4): Descriptive statistics of Do you believe that the social media advertisements should directly incorporate Kurdish culture?

Figure 4 evaluates the response to the question, "Do you believe Kurdish culture should be directly integrated in the social media advertisement?" More respondents felt that Kurdish culture should play a significant role in the content of the advertisements in social media marketing when compared to the survey participants who did not pay attention to Kurdish culture in online advertisements; 97 people of those who agreed that Kurdish culture should be taken into account in the advertisement also stated that they had made an online marketing after viewing an online advertisement.



Figure (5): Descriptive statistics of which site for social media does you use the most?

Figure 5 shows that Instagram users were most influenced by online advertisements when making purchases, with 98 cases of these users doing so. Facebook users were next, at 59 people, followed by Instagram users at 98, and other users (Snap chat) at 26. The report also reveals that Instagram is the most



popular social media channel for making purchases, and Facebook in second order.



Figure (6) Descriptive statistics of Educational Levels?

The study supports the customer marketing behavior varies well with education level. That instance, as demonstrated in Figure 6, a higher education level results in more marketing online after viewing online advertisements. The percentage of customers who make marketing online or through social media also increases as consumer education increases. The maximum response rate between the students at numerous educational levels was given by the postgraduates, who reported making an online purchase after viewing an advertisement in the amount of 117, 45 people of undergraduates reported making an online marketing after viewing advertising, compared to 40 of those with less than a bachelor's degree.

Variables not in the Equation						
			Score	df	Sig.	
Step 0		Gender	7.313	1	.007	

Table (2):	Variables	not in the	Equation
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Variabl	Marital status	7.162	1	.007
es	Educational degree	12.445	1	.000
	Does the Covid 19 pandemic helped the online shopping to grow?	23.862	1	.000
	Which social media platform you use for online shopping? Facebook	1.201	1	.273
	Instagram	.006	1	.936
	Snap chat	.154	1	.695
	Do you trust online shopping?	.191	1	.662
	Does online shopping facilitated your work?	9.613	1	.002
	Does online shopping save you time?	10.033	1	.002
	Age (Binned)	.013	1	.908
	Monthly income (family or self)	3.630	1	.057
Overall Statistics				.000

In the table (2), every change that does not go into the model and each of them is less than p-value or (0.05) in the zero step, which is less than (Gender, Marital status, Educational degree, Does the Covid 19 pandemic helped the online shopping to grow?, Does online shopping facilitated your work?, Does online shopping save you time?) Their p-value less than (0.05).

#### 3- Estimation parameters of logistic regression model

Here, the parameters were calculated using maximum likelihood estimation, and we then extracted the estimated odds ratio for each parameter. This is the first phase in the estimation process.

### 4- Test significant for the variables entered logistic regression model

It should be necessary to include hypotheses for each parameter in order to depend on the model's estimated parameters, which were obtained through the use of the maximum likelihood technique (Mawlood, 2019):



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 $H_0: \beta_i = 0$ 

 $H_0: \beta_i \neq 0$ 

Tested the hypotheses above by using (wald) test and the value of (p-value) compare it with ( $\alpha = 0.05$ ). Rejected the null hypotheses when (p-value) less than ( $\alpha = 0.05$ ) and accepted the null hypotheses when (p-value) greater than ( $\alpha = 0.05$ ).

Coefficients													
Iteratio n step 1	-2 Log likelih ood	Consta nt	x1	x6	x7	x8	x11	x12	x13	x16	x20	x21	x22
1	391.30	5.366	0.5 7	0.5 1	- 0.2 2	0.2 0	0.3 2	- 0.4 3	- 0.3 1	- 0.6 0	- 0.8 4	- 0.6 6	- 0.2 7
2	388.43	6.928	0.6 5	0.6 4	- 0.2 9	0.2 7	0.4 2	- 0.5 6	- 0.3 6	- 0.7 1	- 1.0 9	- 0.8 8	- 0.3 9
3	388.40	7.124	0.6 6	0.6 6	- 0.2 9	0.2 7	0.4 3	- 0.5 7	- 0.3 7	- 0.7 2	- 1.1 2	- 0.9 1	- 0.4 0
4	388.40	7.127	0.6 6	0.6 6	- 0.2 9	0.2 7	0.4 3	- 0.5 7	- 0.3 7	- 0.7 2	- 1.1 2	- 0.9 1	- 0.4 0
5	388.40	7.127	0.6 6	0.6 6	- 0.2 9	0.2 7	0.4 3	- 0.5 7	- 0.3 7	- 0.7 2	- 1.1 2	- 0.9 1	- 0.4 0

Table (3): Iteration History by enter method

The initial value for iteration in Table (3) was 1944.96, and the maximum likelihood approach (entry method) was used to estimate the parameters. The estimation stopped at iteration number 8 because the parameter estimations changed by less than (0.01).

Table (4): Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	69.418	12	.000
	Block	69.418	12	.000



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Model	69.418	12	.000

Table (4) displays the model significance determined by the Chi-square test result. Since the p-value was less than (0.05), the model was determined to be appropriate or suitable by the Chi-square test.

Table (5)· R- square	for hinary	logistic model	(Model	Summary)
Table (5). n- square	IOI DILIALY	logistic model	liviouei	Summary

	• • •		
Step	-2Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	395.679ª	.359	.465

The  $(R^2)$  for the logistic model and the evaluation of the model's robustness or the scale of the impact of the explanatory variable on the dependent variable are both explained in Table (5). Explains the  $(R^2)$  (46.5%) for the logistic model and the test of the strength of the model or the size of the effected the explanatory variable on the dependent variable. The Cox and Snell, and Nagelkerke R2 in Table above recommend that the variation in the level of evaluation outcomes explained by the evaluation factors equal to 35.9%, displays the explanatory variables of the dependent variable.

Table (6): Hosmer and Lemeshow Test (chi-square)

Step	Chi-square	df	Sig.
1	23.451	8	0.003

Table (6) above exhibits that the model is appropriate or suitable with the data according to the hypotheses if the (p-value = 0.003) value is less than or equal to (=0.05):

 $H_0$ : The model is not suitable  $H_1$ : The model is suitable



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#### Table (7): Contingency Table for Hosmer and Lemeshow Test

		Other. Does not online marketing after ads = NO		Other. Do marketing aff	Total	
		Observed	Expected	Observed	Expected	
Step	1	23	24.253	8	6.747	31
1	2	25	23.011	8	9.989	33
	3	22	21.599	12	12.401	34
	4	27	18.650	7	15.350	34
	5	8	16.377	26	17.623	34
	6	12	13.359	23	21.641	35
	7	11	10.564	23	23.436	34
	8	4	8.635	30	25.365	34
	9	10	6.664	24	27.336	34
	10	5	3.888	32	33.112	37

Table (8): Variables in the Equation 1

Variables in the Equation										
		В	S.E.	Wald	df	Sig.	Exp(B)	95%C.I.for EXP(B)		
								Lower	Upper	
Step 1ª	X1	.778	.278	7.830	1	.005	2.177	1.262	3.754	
	X7	327	.151	4.676	1	.031	.721	.536	.970	
	X8	.290	.124	5.442	1	.020	1.337	1.047	1.705	
	X12	.384	.201	3.636	1	.057	1.468	.989	2.177	
	X13	558	.198	7.962	1	.005	.572	.388	.843	
	X15	392	.195	4.028	1	.045	.676	.461	.991	
	X16	733	.188	15.12 5	1	.000	.481	.332	.695	
	X20. 1	-1.217	.429	8.042	1	.005	.296	.128	.687	



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	X20. 2	871	.400	4.739	1	.029	.418	.191	.917
	X20. 3	387	.450	.737	1	.391	.679	.281	1.642
	X20. 4	849	.322	6.949	1	.008	.428	.228	.804
	X2	049	.100	.243	1	.622	.952	.782	1.158
	Con stan t	7.747	2.280	11.54 8	1	.001	2314.1 15		
a. Variable(s) entered on step 1									

The Wald test represents the parameter test values for the model and shows that (X1, X7, X8, X13, X15, X16, and X20) are significant variables by comparing the value of (sig) with ( $\alpha$ = 0.05). It also shows that these significant variables had an impact on the dependent variable (Have you ever ordered something online after seeing its advertisement online? greater than the other variables (Yes = 1 and No = 0) (X2, X12, X20.3). The other non-significant variables should be removed or canceled from the model while keeping the seven significant variables.

The "Exp(B)" column is label for the odds ratio of the row independent with the dependent variable (status). It is the predicted change in odds for a unit increase in the corresponding independent variable. Odds ratios less than 1 correspond to decreases and odds ratios more than 1.0 correspond to increases in odds. Odds ratios close to 1.0 indicate that unit changes in that independent variable do not affect the dependent variable

$$p(t) = \frac{1}{1+e^t}$$

 $=\frac{1+e^{-(0.778-0.327+0.290+0.384-0.58-0.392-0.733-1.217-0.871-0.387-0.849-0.049+7.747)}\dots(8)$ 

#### **12-Conclusion and Recommendation**

#### 12.1 Conclusion:

1. We note through this analysis that more cases that are used in our field of

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the genus (female) (%55.29) percentage, either less of them with these felid are of the genus (male) (%44.70) percentage.

- 2. Depending on the results of analysis can be classified variables by importance and its impact on Online marketing and advertising as follows:
  - a. Gender

LFU

- b. Source of income
- c. Monthly income (family or self)
- d. Does online shopping save you time?
- e. Does the Covid 19 pandemic helped the online shopping to grow?
- f. Does the type and quality of the goods affect the online market user?
- g. Which social media platform you use for online shopping?
- 3. Hosmer and Lemeshow Test (chi-square) used and the value of the (p-value=0.003) is less than to ( $\alpha = 0.05$ ), it means that the model is suitable or appropriate with the data according the hypotheses.
- 4. Used maximum likelihood method for estimation parameters where constant is included and the initial value for iteration was (1944.96), Estimation terminated at iteration number 8 because parameter estimates changed by less than (0.001).
- 5. The classification of the dependent variable gender, where the total percentage Correct for prediction of dependent variable depending on the model is (%72.4). And all independent variables entered model of logistic regression where the results as the Wald test represents the parameters test values for the model and shown that (X1, X7, X8, X13, X15, X16, X20) means where they get a treatment are significant variables by compare the value of (sig) with ( $\alpha = 0.05$ ), also indicates that these significant variables affected on the dependent variable they had (Have you ever ordered anything online after looking at its advertisement online? Yes =1 and No = 0)
- 6. One of the important conclusions reached by the study is to illustrate the factors that effecting on Customer Purchasing in Erbil city of Iraq, according of the results, the factors of (Gender, Source of income, Monthly income (family or self), Does online shopping save you time?, Does the Covid 19 pandemic helped the online shopping to grow?, Does the type and quality of



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the goods affect the online market user? and Which social media platform you use for online shopping?) have high effecting on Customer Purchasing. On the other hands, the variables of (Age, How many hours do you use social media on a week?, Do you trust online shopping?, Does online shopping facilitated your work? and Does the item you received was the same that you ordered?) do not have any effect on Customer Purchasing.

#### 12.2 Recommendations

- 1. This research recommends taking a sample size bigger than this and then analyzed it toget better results.
- 2. However, this study is limited to social media users in Erbil City and, therefore, cannot be generalized. The future research should focus on examining the relationship between social media marketing and buying decisions as a comparative study for different cultures by employing pooled data analysis techniques. Future studies could be done to learn about the specific cultural and behavioral aspects that can be used in social media advertisements to change the buying behavior of consumers

#### **References:**

1- Berne, J. C. (2010). A multivariate logistic regression analysis of risk factors for blunt cerebrovascular injury. Journal of vascular surgery, 51(1), pp.57-64.

2- Field, A. (2009). Logistic regression. new york: Discovering statistics using SPSS.

3- Hosmer, D. W., & Lemeshow, S. (2000). Applied Logistic Regression 2nd edn John Wiley & Sons. Inc.: New York, NY, USA.

4- Ahmed, R. (2016). Using Logistic Regression to Distinguish Between Fatty and Fibroid Masses in Medical Imaging (Ultrasound Image). ZANCO Journal of Pure and Applied Sciences, 193-201.

5- Janzen, F. a. (1998). Logistic regression for empirical studies of multivariate selection. Evolution, 52(6), pp.1564-1571.

6- Kadir.D.H, k. a. (2022). An application of Logistic Regression Modeling to Predict Risk factor for Bypass Graft diagnosis in Erbil. Cihan univeristy-Erbil, 6(1) 57-63.

7- Barznji, kareem, N. (2018). Using Logistic Regression Analysis and Linear Discriminant Analysis to identify the risk factors of Diabetes. Zanco Journal of Humanity Sciences, 248-268.



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ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

8- Mawlood, K. I. (2019). Using Logistic Regression and Cox Regression Models to Studying the Most Prognostic Factors for Leukemia patients. QALAAY ZANIST, 4(3) 705-724.

9- O'brien, S. a. (2004). Bayesian multivariate logistic regression. Biometrics, 60(3), pp.739-746.

10- Wright, R. E. (1995). Logistic regression. In L. G. Grimm & P. R. Yarnold (Eds.), Reading and understanding multivariate statistics. American Psychological Association. 5(3) (pp. 217–244).

11- Tripepi, G., Dekker, F.W. and Zoccali, C., 2008. Linear and logistic regression analysis. *Kidney international*, *73*(7), pp.806-810.

12- Kleinbaum, D.G., Kupper, L.L. and Chambless, L.E., 1982. Logistic regression analysis of epidemiologic data: theory and practice. *Communications in Statistics-Theory and Methods*, *11*(5), pp.485-547.

13- Harrell, F.E., 2001. *Regression modeling strategies: with applications to linear models, logistic regression, and survival analysis* (Vol. 608). New York: springer.

کاریگەریی بەبازارکردنی ئەلیکترۆنیی لەسەر دۆخی بەکاربەران لە ھەولێر بە بەکار ھینانی شیکردنەوەی لاری لوجیستیك

پوخته

مەبەست لەم لێكۆڵينەوەيە شيكردنەوەى كاريگەريى بەبازاپكردنى ئەليكترۆنييە لەسەر دۆخى بەكاربەران لە ھەولێر-كوردستان. بە شێوەيەكى چەندايەتى ئەنجامدراوە، بە بەكارھێناى نمونەگرتنى ھەپەمەكى پاستەوخۆ. داتاكان لە پێگەى پاپىرسييەكەوە لە نێوان ٣٤٠ بەكارھێنەرى سۆشيال ميديا كۆكراونەتەوە،. گۆپاوەكانى توێژينەوەكە بريتين لە بريارەكانى كړينى بەكاربەر بە ريگاى ئونلاين وەك گۆپاويككى وابەستە و پيكلامى سۆشيال ميديا، داھات، خوێندن، پەگەر، تەمەن و كولتوور وەك گۆپاويكى وابەستە و پيكلامى سۆشيال ميديا، داھات، خوێندن، پەگەر، سۆشيال ميديا كاريگەرييەكى گەورەى لەسەر بريارى كړينى بەكاربەران ھەيە. لايەنى دارايى و سۆشيال ميديا كاريگەرييەكى گەورەى لەسەر بريارى كړينى بەكاربەران ھەيە. لايەنى دارايى و سۆشيال ميديا كاريگەرييەكى گەورەى لەسەر بريارى كړينى بەكاربەران ھەيە. لايەنى دارايى و پەروەردەى كړياران كاريگەرييەكى كەمى لەسەر بەيارى كړينى بەكاربەران ھەيە. لايەنى دارايى و پەروەردەى كړياران كاريگەرييەكى كەمى لەسەر بويارى ئېينى بەكاربەران ھەيە. لايەنى دارايى و كۆشيال ميديا ھەبووە، بەلام پەگەز و تەمەن و كلتورى بەكاربەران، سەرچاوەى داھات و پەتاى كۆشيەك مىديا ھەبووە، بەلام پەگەز و تەمەن و كلتورى بەكاربەران، سەرچاوەى داھات و پەتاى كۆشيەد-١٩ ( كە يارمەتى گەشەكردنى بازاپكردنى ئۆنلاين داوە) ھەموويان كاريگەرييەكى



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پێشکەوتووانە بە پشکنینی دۆخی بەکاربەران لە شاری ھەولێر، بەدواداچوون بۆ ئەوە دەکات کە چۆن ڕێکلامی سۆشیال میدیا کاریگەری لەسەر ڕەفتاری کړینی کړیاران ھەیە. جگە لەوەش دەرئەنجامی شیکاری داتاکان بە بەکارھێنانی ئامرازی ئاماری SPSS و مایکرۆسۆفت ئێکسڵ.

#### أثر التسويق الإلكتروني على أوضاع المستهلكين في أربيل باستخدام تحليل الانحدار لوجيستي

الملخص:

اجريت هذه الدراسة لتحديد تأثير التسويق الإلكتروني على سلوك المستهلك باستخدام تحليل الانحدار لوجيستي. وقد تم استخدام الاستبانة في هذه الدراسة وتم توزيعها بشكل عشوائي على (340) من المستخدمين لوسائل التواصل الاجتماعي في محافظة أربيل في اقليم كوردستان حيت تتكون من مجموعة المتغيرات (قرارات شراء المستهلك كمتغير تابع، واعلانات وسائل الاجتماعي والدخل والتعليم والجنس والعمر والثقافة المستهلكين كمتغيرات المستقلة). توصلت نتائج الدراسة إلى ان اعلانات وسائل الاجتماعي لها تأثير كبير على قرارات الشراء لدى المستهلك، والمتغيرات الاخرى (الدخل والتعليم) لها تأثيرات ضعيفة على العلاقة بين قرارات الشراء لدى المستهلك، والمتغيرات الاخرى (الدخل والتعليم) لها تأثيرات ضعيفة على العلاقة بين قرارات الشراء لدى المستهلك، والمتغيرات الاخرى (الدخل والتعليم) لها تأثيرات الجنس والعمر والثقافة ومصدر الدخل ووباء COVID-19) لها تأثيرات متوسطة على قرارات الشراء لدى المستهلك. ولاستخراج نتائج تحليل البيانات تم استخدام البرنامج الاحصائي SPSS و الدى المستهلك.