ROLE OF BIG DATA ANALYTICS IN INCREASING BRAND EQUITY WITHIN PHARMACEUTICAL INDUSTRY

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ABSTRACT

The current study aimed at examining the influence of big data analytics (Consumer Acquisition and Retention, Personalization, Cost Reduction and Targeted Advertising) and its role in increasing brand equity within pharmaceutical industry in Jordan during the fiscal year 2020-2021. For that sake, quantitative method was used and a questionnaire was developed and uploaded online in order to collect primary data. A sample of (94) marketing and sales managers in pharmaceutical companies and drug stores in Jordan responded to the questionnaire. SPSS v. 23rd was used in order to screen and analyze gathered data; study indicated that the main hypothesis was accepted and big data analytics play a role in increasing brand equity within pharmaceutical industry in Jordan with high level of relationship and an explained variance of 59.7%. In addition to that, study was able to uncover the fact that marketing and sales managers in pharmaceutical companies and drug stores in Jordan seemed to have a high level of awareness regarding the concept of brand equity and big data analytics as their answers were positive and reflected reliability of study tool. As for variables of big data analytics, it was revealed that big data helps brand equity through the targeted advertising which focuses on orienting the brand to the right audience who are able to help its reputation, equity and meaning. Study recommended taking care of the quantities of data that are received by organizations during marketing campaigns, as this data can be converted into valuable information if properly arranged and organized.

Keywords: Pharmaceutical, Big Data Analytics, Brand Equity, International Brand, Brand Reputation.

INTRODUCTION

There are many ways and methods that help create and appear goods that have brand value and create this value, as there are three basic elements that need to be taken into consideration in order to transform the commodity from a normal commodity to a branded one, which is the customer's point of view in the first place and then Negative and positive effects and ultimately the final value (Gordon et al., 2013). The customer's point of view mainly includes his knowledge and experience with this brand and its products, as the customer's point of view results in a set of positive and negative effects. In the event that the value of the customer's brand is highly positive, this would be beneficial. And the positive on the company and its products, and the opposite is completely true, in the event that the value is negative, this would reflect negatively on the value of the commodity (Akter & Wamba, 2016).

In order to reach these results, and create value for the brand, marketers are in constant search for the best and most successful ways and resorted to e-marketing by relying on e-mail, social media sites, smart phone applications, and many others, which resulted in a large amount of data and information related to customers, their preferences, desires, and search trends (Chong et al., 2017).

Problem Statement

According to Wuepper & Patry (2017); it is possible for organizations to create high value for their brand by making it easily distinguishable and better than other similar products in terms of its quality and reliability. Chiang & Yang (2018) added that brands include everything that distinguishes the commodity from other commodities, and this includes letters, numbers, and symbols, which take a distinctive form that distinguishes the commodity from other commodities. While Anshari et al. (2018). Cohen (2018) argued that a brand is divided into a regular brand and a famous brand (high end). The famous brand can travel across countries through the means of communication, advertising and the impact of commercial globalization. Recently, we hear a lot about the term Big Data and the rapid spread of this field in the labor market. But have we ever wondered what Big Data is? In order to agree in principle, there is more than one definition of the term Big Data, as explained by the International Telecommunication Union (ITU) that there is no precise definition of big data. In general, when we talk about big data, we are talking about data of various types, sources and sizes. Based on the above argument, the current study aimed at examining the influence of big data analytics on brand equity within Jordanian pharmaceutical industry and drug stores from the perspective of marketing and sales managers.

Model and Hypotheses

Based on the above argument, researchers presented the following model in order to highlight the relationship between study variables (Figure 1)
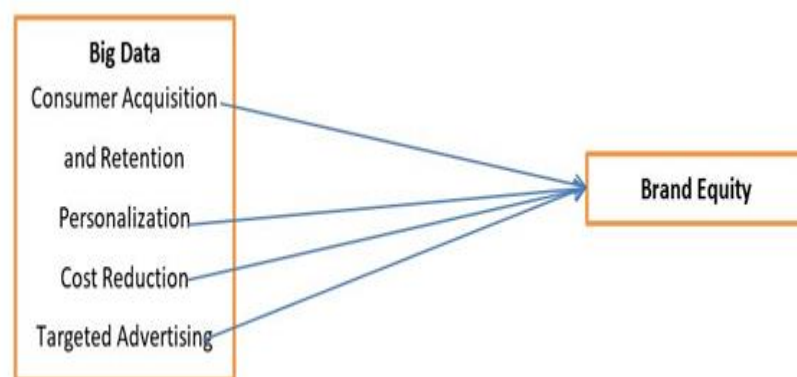
(Anshari et al, 2018; Cohen, 2018; Bourreau et al, 2017; Wuepper and Patry, 2017; Chiang and Yang, 2018)

FIGURE 1
STUDY MODEL

Hypotheses Development

Based on the above hypotheses testing, researchers were able to extract the following set of hypotheses:

> **H:**   *Big data analytics positively influences brand equity*
>
> **H$_1$:**   *Consumer acquisition and retention positively influences brand equity*
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> **H$_2$:**   *Personalization positively influences brand equity*
>
> **H3:**   *Cost reduction positively influences brand equity*
>
> **H$_4$:**   *Targeted advertising positively influences brand equity*

LITERATURE REVIEW

The Concept of Brand Equity

Chiang & Yang (2018) defined brand equity as the results of marketing efforts for a product, which would turn this product into a brand compared to the same product if it did not receive the same marketing efforts and did not turn into a brand. While Marques et al (2020) defined it as the value that the company generates from a product that has succeeded in achieving great popularity among people Brand equity is related to the value of the brand for the marketer and the consumer alike (Delanoy & Kasztelnik, 2020). It means to the marketer more profit, more cash flow and more market share (Hashem, 2021). For example, in Britain, Hitachi and GE established a factory for televisions, and these televisions were sold at a higher price of $ 75 once the name Hitachi was put on them this reflects the value of the name Hitachi (Holmlund et al., 2020).

From a consumer's point of view, brand equity means a strong positive attitude to a brand and a favorable valuation based on positive meanings and beliefs that are easy to retrieve and activate (Keller & Brexendorf, 2019). Foroudi et al. (2018) argued that these three factors create a preferential relationship between the consumer and the brand which is a valuable thing for the company and an essential component of the value of the brand. According to Seo and Park (2018); marketers can get the value of a mark through three actions: build it, rent it, or buy it, where companies can build the value of the brand by emphasizing that the relationship really provides positive results, linking and emphasizing it through advertising, taking into account the time factor in the formation of this value, for example, Mercedes Motors (Lim et al., 2020). Mourad et al. (2020) also noted to the fact that organizations can rent the intangible value of the brand by expanding the use of the mark with a positive attitude and linking it to another product, for example: Coca-Cola contains in its old product lines dedicated to diet, caffeine-free, cherry juice……etc. There are several studies that confirmed the success of brand expansion and exploitation of its good image and its suitability for other products (Algharabat et al., 2020); (Liu, 2020); (Zollo et al., 2020); (Ebrahim, 2020).

Big Data

Before we get to the definition of big data, we must know what is dat? Amado et al. (2018) defined data as the raw image of the information before the operations of sorting,

arranging and processing, and it cannot be used in its initial form before processing. Raw data can be divided into three types:

- Structured data: data that is organized in tables or databases.
- Unstructured data: It constitutes the largest proportion of the data, which is the data that people generate daily from text writings, images, videos, messages, clicks on websites ... etc.
- Semi-structured data: It is considered a type of structured data, but the data is not in the form of tables or databases.

Experts Ducange (2018); Buhalis & Volchek (2021); Nair et al. (2017) - define big data as any set of data that exceeds the ability to process it using traditional database tools from capturing, sharing, transferring, storing, managing and analyzing within an acceptable period of time for that data; from the point of view of service providers, it is the tools and processes that organizations need to deal with a large amount of data for the purpose of analysis. The two parties agreed that it is huge data that cannot be processed by traditional methods in light of the aforementioned restrictions (Wright et al., 2019); (Ćurko et al., 2018). From the perspective of De Luca et al. (2020), big data is defined as high-volume, fast-flowing and diversified information assets that require cost-effective and innovative processing methods to develop insights and decision-making methods. IBM – the leading computers company – stated that big data is created by everything around us and at all times every digital process and every exchange in social media produces big data for us, transmitted by systems, sensors, and mobile devices big data has multiple sources in speed, size and diversity and to extract moral benefit from Big Data We need perfect handling, analytical abilities, and skills (Montgomery et al, 2019). Another definition for big data presented by André et al (2018) who argued that big data is a set or sets of data that has its own unique characteristics (such as size, speed, diversity, variance, data validity, etc.) which cannot be efficiently processed using current and traditional technology to achieve its benefit.

Sources of Big Data

According to Matz & Netzer (2017), there are multiple source from an organization can obtain data, these sources include:

- Resources arising from running a program, whether governmental or non-governmental, such as electronic medical records, hospital visits insurance records, bank records, and food banks.
- Commercial or transaction-related sources, arising from transactions between two entities, for example credit card transactions and transactions conducted via the Internet, including through mobile devices.
- Sensor network sources, for example, satellite imaging, road sensors, and climate sensors.
- Tracking device sources, for example tracking data from mobile phones and the Global Positioning System.
- Behavioral data sources, for example, Internet searches for a product, service, or other type of information, and page views on the Internet.
- Data sources for opinions, for example, comments on social media.

Big Data Analytics in Marketing

According to Buhalis & Volchek (2021), big data analytics is the use of advanced analytics techniques against large and diverse data classes that include structured, semi-structured and unstructured data from different sources, and in sizes from terabytes to zettabytes. Wang & Wang (2020) argued that big data is a term applied to categories of data whose size or

type exceeds the traditional ability of relational databases to capture, manage, and run data with low latency. Montgomery et al. (2019) also state that big data has one or more of the following characteristics: high volume, high speed, or high diversity. Artificial intelligence, mobile devices, and the Internet of Things are increasing the complexity of data with new data forms and sources. For example, big data comes from sensors, devices, video/audio files, networks, log files, transactional applications, the web, and social media - much of it being generated in real time and on a very large scale (Ducange et al., 2018). On the other hand, Liu et al. (2019) argued that big data analysis allows analysts, researchers, and business users to make better and faster decisions using data that was previously inaccessible or used. While Kauffmann et al. (2020); Singh et al. (2018) indicated that companies can use advanced analytics techniques such as text analysis, machine learning, predictive analytics, data mining, statistics and natural language processing to gain new insights and insights from previously untapped data sources independently or with existing enterprise data.

METHODOLOGY

Adopting the quantitative appraoch, current study collected primary data using a questionnaire; the questionnaire consisted of two main section including demographics of study sample and statements related to study variables (Consumer Acquisition and Retention, Personalization, Cost Reduction and Targeted Advertising). The questionnaire was built on likert 5 scale and was uploaded online – for COVID-19 health precautions- for a time of 12 weeks in order to collect as much data as possible.

Population of study consisted of marketing and sales managers in pharmaceutical companies and drug stores in Jordan through the fiscal year 2020-2021. A convenient sample of (100) was meant to be reached; but after application process researchers were able to retrieve (94) properly filled questionnaire and reaching a statistical ratio of 94% as accepted.

SPSS V. 23rd was used in order to screen and analyze gathered primary data. Cronbach Alpha was used to test the stability of the scale as in results appearing within Table 1 below. It was found that alpha value for each variable was greater than accepted percent 0.60; that reflected the reliability of the scale.

Table 1 RELIABILITY OF STUDY TOOL	
Variable	**Alpha**
Consumer Acquisition and Retention	0.792
Personalization	0.858
Cost Reduction	0.671
Targeted Advertising	0.779
Brand Equity	0.785

Other used statistical tests included:

- Descriptive Statistics (mean, percentage, frequency, std. deviation)
- Multiple Regression
- OLS Regression

Analysis

Demographic results

Frequency and percentage of respondents were calculated as according to the below table 2. It can be seen that majority of study sample were males forming 74.5% compared to females who only appeared to have a portion of 25.5%. As for academic qualification and experiences, it can be read through the table that majority of respondents held PhD degree forming 63.8% and who had an experience in the field of 10-13 years forming 41.5% of total sample (Table 2).

Table 2 DESCRIPTIVE STATISTICS OF SAMPLE			
		f	%
Gender			
	Male	70	74.5
	Female	24	25.5
Education			
	Diploma	11	11.7
	BA	22	23.4
	MA	1	1.1
	PhD	60	63.8
Experience			
	2-5	16	17.0
	6-9	30	31.9
	10-13	39	41.5
	+14	9	9.6
	Total	94	100.0

Questionnaire Analysis

Mean and std. deviation of sample's attitudes towards statements of questionnaire were calculated. Results showed that respondents had positive attitudes towards statements of questionnaire as all means scored higher than mean of scale 3.00 which is statistically positive. Going deeper into analysis, the highest positively answered statement was "*Through big data, sales, marketing data and accounts can be reviewed for optimal cost reduction*" soring a mean of 4.20/5.00 and a std. deviation of .979 compared to the least positively answered statement which was "*It is possible to retain lost customers knowing a lot about them*" scoring a mean of 3.50/5.00 and a std. deviation of 1.276.

The same tests were run on study variables in genera in order to highlight their mean and std. deviation. As Table 3 and Table 4 below indicated the highest mean was for "brand equity" scoring a mean of 3.99/5.00 and std. deviation of .670 compared to the least positively received variables which was "customer acquisition and retention" scoring a mean of 3.75/5.00 and a std. deviation of 0.793.

Table 3 MEAN AND STD. DEVIATION OF STATEMENT		
	Mean	**Std. Deviation**
Big Data		
Consumer Acquisition and Retention		
Knowing so much about customers increases the chances of their loyalty	3.56	1.093
It is possible to retain lost customers knowing a lot about them	3.50	1.276
Collecting data about customers eases the process of satisfying them	3.85	.983
There would be a chance to engage customers with material that is relevant to their interest	3.78	1.039
Suitable content can attract customers' attention	4.09	.947
Personalization		
Personalization increases advertising effectiveness	3.69	1.068
Through personalization, consumers' needs are understood better than before	3.94	.890
Big data analytics can predict users' preferences and personalize the item according to it	3.99	.886
Ads and offers are more relevant according to recommendations	4.05	.884
Personalization help in price optimization which help in boosting profit margins	3.99	.886
Cost Reduction		
Big data analytics can help to reduce cost and wasted clicks on ads	4.01	.933
Through big data, sales, marketing data and accounts can be reviewed for optimal cost reduction	4.20	.979
Big data presents upselling and cross-selling opportunities	3.80	1.132
There is an approach to target the audience which prevents wasted advertising hence reduce cost	3.96	1.004
Big data analytics can reduce costs through presenting all the needed info for interested parties	3.62	1.174
Targeted Advertising		
Access to data on consumers preferences, marketers can develop more targeted marketing	3.55	.980
Targeting can be done through analyzing how people engage with the brand	3.80	.923
Bid data can help in revealing patterns and trends to make advertising more relevant	3.72	.897
Through big data analytics, there would be a space for engaging more customer with the brand	4.04	.854
Through big data analytics, there would be a chance to increase marketing channels	4.09	.863
Brand Equity		
Brands that have better data are stronger and more popular	3.87	.975
Analytical efforts can help in supporting better brand equity	4.01	.886
Gathering all needed information is the key role on defining a brand equity	4.09	.876
Big data analytics provides significant intangible assets for better equity	3.94	1.025
Brand equity means better profit margins and spread for the	4.05	.795

brand itself		

Table 4
VARIABLES' DESCRIPTIVE STATISTICS

	Mean	Std. Deviation
Consumer Acquisition and Retention	3.75	0.793
Personalization	3.93	0.739
Cost Reduction	3.91	0.689
Targeted Advertising	3.84	0.658
Brand Equity	3.99	0.670

Hypotheses Testing

Multiple regression and OLS regression were used in order to test and prove study hypotheses. Following results indicated that big data analysis plays a role in increasing brand equity within pharmaceutical industry (Table 5).

H: *Big data analytics positively influences brand equity*

Table 5
TESTING MAIN HYPOTHESIS

Model	R	R Square	F	Sig.
1	0.773[a]	0.597	32.996	0.000

Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.663	0.296		2.239	0.028
	Consumer Acquisition and Retention	0.180	0.091	.213	1.965	0.053
	Personalization	-0.017	0.130	-0.018	-0.127	0.899
	Cost Reduction	0.260	0.121	0.267	2.150	0.034
	Targeted Advertising	0.443	0.090	0.435	4.918	0.000

Multiple Regression test was used to test above hypothesis, it was found that F value was significant at 0.05 level, so that we accepted that Big data analytics positively influences brand equity. Also that r=0.773 reflected high level of relationship between the variables as well as Big data analytics explain 59.7% of the variance in brand equity (Table 6 and Table 7)

H₁: *Consumer acquisition and retention positively influences brand equity*

Model Summary

Table 6
TESTING 1ST HYPOTHESIS

Model	R	R Square	F	Sig.
1	0.622[a]	0.387	58.146	0.000

Coefficient

Model	Unstandardized Coefficients	Standardized	t	Sig.

		B	Std. Error	Coefficients Beta		
1	(Constant)	2.016	.265		7.619	.000
	Consumer Acquisition and Retention	.526	.069	.622	7.625	.000

OLS Regression test was used to test above hypothesis, it was found that t- value was significant at 0.05 level, so that we accepted that Consumer acquisition and retention positively influences brand equity. Also that r=0.662 reflected **high level of relationship** between the variables as well as Consumer acquisition and retention explains **38.7%** of the variance in brand equity.

H₂: *Personalization positively influences brand equity*

Table 7
TESTING 2ND HYPOTHESIS

Model Summary

Model	R	R Square	F	Sig.
1	0.648[a]	0.419	66.443	0.000

Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.682	0.288		5.835	0.000
	Personalization	0.587	0.072	0.648	8.151	0.000

OLS Regression test was used to test above hypothesis, it was found that t- value was significant at 0.05 level, so that we accepted that Personalization positively influences brand equity. Also that r=0.648 reflects high level of relationship between the variables as well as Personalization explains 41.9% of the variance in brand equity (Table 8).

H₃: *Cost reduction positively influences brand equity*

Table 8
TESTING 3RD HYPOTHESIS

Model Summary

Model	R	R Square	F	Sig.
1	0.656[a]	0.431	69.566	0.000

Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.491	0.304		4.898	0.000
	Cost Reduction	0.638	0.077	0.656	8.341	0.000

OLS Regression test was used to test above hypothesis, it was found that t- value was significant at 0.05 level, so that we accepted that Cost reduction positively influences brand equity. Also

that r=0.656 reflects high level of relationship between the variables as well as Cost reduction explains 43.1% of the variance in brand equity (Table 9).

H₄: *Targeted advertising positively influences brand equity*

Table 9
TESTING 4TH HYPOTHESIS

Model Summary				
Model	R	R Square	F	Sig.
1	0.693[a]	0.480	84.947	0.000

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.283	0.298		4.302	0.000
	Targeted Advertising	0.705	0.077	0.693	9.217	0.000

OLS Regression test was used to test above hypothesis, it was found that t- value was significant at 0.05 level, so that we accepted that Targeted advertising positively influences brand equity. Also that r=0.693 reflects high level of relationship between the variables as well as Targeted advertising explains 48% of the variance in brand equity.

DISCUSSION

The current study aimed at examining the influence of big data analysis and its role in increasing brand equity within pharmaceutical industry in Jordan during the fiscal year 2020-2021. For that sake, quantitative method was used and a questionnaire was developed and uploaded online in order to collect primary data. A sample of (94) marketing and sales managers in pharmaceutical companies and drug stores in Jordan responded to the questionnaire. SPSS v. 23rd was used in order to screen and analyze gathered data; study was able to reach following findings:

- Marketing and sales managers in pharmaceutical companies and drug stores in Jordan seemed to have a high level of awareness regarding the concept of brand equity and big data analytics as their answers were positive and reflected reliability of study tool.
- The main hypothesis of study was accepted and there appeared that big data analytics positively influences brand equity with high level of relationship and an explained variance of 59.7%
- Variables of big data analytics included (Consumer Acquisition and Retention, Personalization, Cost Reduction and Targeted Advertising) were tested also as hypotheses. Results indicated that all variables' influences on brand equity were proved with high level of relationship.
- The highest variable in influence which appeared through its variance was targeted advertising which scored a variance of 48%.
- The least influential variable of all was Consumer acquisition and retention which scored a variance of 38.7% but still managed to have a high level relationship.
- Other variables were also influential including (personalization and cost reduction) with a high level relationship and a variance of 41.9% and 43.1% respectively.

Study was able to prove that big data, its gathering and analytics play a huge role in defining a more coherent approach to framing the brand equity. This was seen through results in which the relationship between big data analytics and brand equity scored a variance of 59.7%

with a high level of relationship. Such results agreed with Wuepper & Patry (2017); Chiang & Yang (2018) and Anshari et al. (2018) who argued that the use of big data allows companies to monitor different patterns and trends related to customers. In addition to Cohen (2018) who stated that monitoring customer behavior is important to motivate loyalty, meaning that, the more data a business collects the more patterns and trends a business can identify. However, going deeper into analysis, it was seen that among the chosen variables of big data analytics (Consumer Acquisition and Retention, Personalization, Cost Reduction and Targeted Advertising), the variable of targeted advertising appeared to be the most influential on brand equity achieving a high level of relationship and a variance of 48%. This idea is attributed to Buhalis & Volchek (2021) who noted to the fact that in the modern business world and the current age of technology, a business can easily collect all the customer data that an organization needs. This result means that it is very easy to understand the modern day client. Basically, all that is necessary is to have a big data analysis strategy in place to maximize the data the organization has, and with a proper customer data analysis mechanism in place the organization will have the ability to elicit important behavioral insights that it needs to act upon in order to retain the customer base and thus improve brand equity which agreed with (Ducange et al., 2018). Also results agreed with Wang and Wang (2020); Liu et al. (2019) who stated that where understanding customer insights will allow the organization to be able to deliver what customers want from it, this is the key step to achieving significant improvement on brand equity. Generally speaking, by using big data analysis techniques and tools, Wal-Mart was able to improve search results for its products on the Internet by 10-15%, while according to a report by McKinsey - a leading business consulting company - that the health sector in the United States, if it used big data analysis techniques effectively and efficiently, would have been Has generated more than 300 million US dollars in annual surplus from the health budget, two-thirds of which is due to a reduction in expenditure costs by 8%.

CONCLUSION

Big data is of high importance, as it provides a high competitive advantage for companies if they can benefit from and process them because they provide a deeper understanding of their customers and their requirements, and this helps to take appropriate and appropriate decisions within the company in a more effective manner, based on information extracted from customer databases, thus increasing efficiency and profit and reducing losses.

In our time, we are witnessing a huge explosion of data. The analysis and processing of this data mainly increases the understanding and understanding of customer requirements, thus increasing efficiency and productivity and reducing losses for companies. However, there are many challenges and obstacles that hinder the use or expansion of big data, which can be addressed in another article, God willing. With the passage of time and technological progress, significant progress is expected in addressing the challenges and constraints of using big data more widely.

RECOMMENDATION

The study recommends the importance of taking care of the quantities of data that are received by organizations during marketing campaigns, as this data can be converted into valuable information if properly arranged and organized. In addition to that, it is necessary to

adopt a mechanism through which the organization has the ability to distinguish between real and fake data, in order to avoid wasting time and money on electronic marketing campaigns that may be directed towards an unreal audience via the Internet.

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