

# Perceived Usefulness of Big-Data for Store Layout: Evidence for Organized Retailers of Karachi

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## Abstract

Big-Data is one of the most useful technologies available nowadays to understand behaviors and patterns. However, in addition to its societal benefits technology might also be used by practitioners in industrial settings. The Retail industry is also treated as the one which might receive major benefits from the use of Big-Data and therefore this study is purposively associated with implications of Big-Data for the retail sector. The Study uses store layout as the dependent variable as it has the most influence on purchase as the real purpose of Big-Data is to analyze behavior and patterns, therefore, the selection of variable is legitimate. However, the technology is not well-known in emerging markets like Pakistan therefore study is linked with quota sampling and uses SMART-PLS to analyze results. Results indicated that Big-Data was perceived as the potent tool for operations of the organized retail sector of Karachi.

**Keywords:** Big-Data, Store Layout, Organized Retail Sector & Perceived Usefulness

## 1 Introduction

The dawn of the 21st century resulted in exponential growth in the volume of digital data (Hajirahimova & Aliyeva, 2015). Studies indicated a 40% increase in the size of digital data every year (Hajirahimova & Aliyeva, 2015) while the reason for exponential growth is continuous use of web, social networking, credit cards and mobile devices etc (Hajirahimova & Aliyeva, 2015). Similarly, data generated from other form of devices like scanners, cameras and GPS transceiver s also getting more accessible (Aktas & Meng, 2017). Thus, abundance of information has been generated (Hajirahimova & Aliyeva, 2015), one of the studies in IBM (2016) indicated that 90% of overall digital data has been generated in the past two years.

Overall size of digital data till 2016 was 1.8 ZB (Cisco, 2018) & by 2020 size of digital data will touch 44 zeta-byte (Hajirahimova & Aliyeva, 2015). However, all of these activities require use of internet though this is also resulting in the increase of unstructured data which makes data beyond the control limits of databases. Big-Data is defined on the bases of volume, variety, velocity, and veracity (Aktas & Meng, 2017) and in field of marketing it has been used of device marketing mix elements (Cao & Manrai, 2020).

This technology has been used to take competitive advantage through development of insight so to gain competitive advantage. Moreover, benefits of Big-Data are not limited to marketing only as Wal-Mart, Google and Amzon etc are some examples of industrial leaders who gain edge through Big-Data (Cao & Manrai, 2020). However, research is still going on to analyze and

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synthesize insights from Big-Data (Aktas & Meng, 2017) as several associated with daily life are still the same (Dekimpe, 2020).

## 2 Problem Statement

Aktas and Meng (2017) indicated that research is still going on to analyze benefits that organizations and policy makers might achieve through using Big-Data. However emerging markets now became center of gravity for data generation as the percentage of data generation is much higher as compared to the matured markets (IDC., 2014). On the other hand, Dekimpe (2020) highlighted retailing as one of the most promising industry for applying Big-Data analytics as technology. Similar has been indicated by one of the prior studies McKinsey (2011) cited by Dekimpe (2020), that Big-Data may increase operating margin for retailers up to 60%.

However, Pakistan is still leap frogging in adopting the technology and NADRA is the only entity across the country with an advanced mechanism of Big-Data (Ashraf, 2013). Analysis made upon large data sets might result in the formulation of the best decision across leading directions (Hajirahimova & Aliyeva, 2015).

Though in Pakistan ignorance is not only because of lack of knowledge and technology (Gallop Pakistan, 2018) but the difference of culture is also preventing the use and implications (Latif, Tunio, Pathan, Jianqiu, Ximei & Sadozai, 2018). This ignorance even became severe when Big-Data acts as game changer for retail sector (Dekimpe, 2020 & McKinsey, 2011) which is critical for Pakistan's economy and yields 17% of GDP (Ahmed, Ullah & Paracha, 2012).

Moreover, the sector also contains several small and medium organizations which makes sector essentially important for several families (Dekimpe, 2020). On the other side studies of the west e.g. Grewal, Roggeveen and Nordfalt (2017) explained how Big-Data along with other technologies causes an increase in the retail business. Though there are almost no studies of Big-Data and its implications and use Pakistan. Therefore, a study is required to explore the potential advantages of Big-Data technology for retail sector of Pakistan. Especially when more and more retailers are adopting the hybrid model for sales (Dekimpe, 2020) & store layout has more impact on purchasing decision as compared to other two challenging processes of retail operation (Aktas & Meng, 2017). Thus, this study uses Big-Data analytics on store layout which is included in top three challenging processes of retail operation along with assortment and pricing.

## 3 Theoretical Framework and Delimitations

An organized form of retail operating in urban areas must adhere to the principles established for urban retail designs (Juel-Jacobson, 2015). This is potent as store layout produce a significant impact on shopping atmosphere and shopping behavior & increases the probability of having a positive response from customers. (Lewison, 1994). However, the use of outdated store layouts is also opted by some of the well-known brands of the recent era (Juel-Jacobson, 2015). Another important variable associated with effective store layout design is product assortment as indicated by Francher (1991). This arrangement will not only optimize the level of customer satisfaction and also produces a positive result on product sales.

Hence it is clarified that store layout is a combination of Aisle Design and Shelf Design and these two variables will also create an impact on retail sales. Therefore, study will link effect of Big-Data as indicated by Dekimpe (2020) and Grewal Roggeveen and Nordfalt (2017) on Aisle design and shelf design. Availability of skilled data scientist has also been used as moderator as Glass & Callahan (2014) indicated that effective analysis of data especially in marketing function requires a technical mix of creativity and analytical skills. Last but not least study will also check the impact of Aisle Design and Shelf Design on sales of retail as indicated by Dekimpe (2020) and Francher (1991).

### ***Open Research Questions***

- Q1: How Big-Data might benefit organized retail sector?
- Q2: How unavailability of Skilled Data Scientist affects application of Big-Data?
- Q3: How Big-Data is influencing consumer purchase at organized retail sector of Karachi?
- Q4: How effective layout design at organized retail influence sales

## **4 Scope & Significance**

The study is particularly beneficial for the retail sector and therefore managers and practitioners associated with the sector might use the study to understand the impact of Big-Data on organized retail. Thus, they may devise better mechanisms to collect data and gauge results. Moreover, the study is also beneficial for further studies and policy formulation as studies conducted on the implications of Big-data are far and few in between especially in emerging economies and Pakistan. Thus, this study must be treated as the base of conducting further research work and to make researchers and practitioners understand the pattern research of Big-Data.

## **5 Literature Review**

Assortment, Product Design, Procurement, Marketing, & Supportive Functions which are required to perform necessary functions like logistic planning are included in the list of major function of retailing (Aktas & Meng, 2017).

Rautaray Pandey Chakraborty and Barua (2017) indicated that use of Big-Data is significant in optimizing customer's experience as well as company's decision so to aid sales. It provides an accurate analysis of customer's retail needs through gauging consumer behavior effectively (Rautaray et al., 2017). Therefore, it is optimal to indicate Big-Data analytics opens a new door of opportunities for retailers thus makes them enable to create value and making retailers perform micro targeting (Dekimpe, 2020).

Previously retailers tend to distribute products passively although through having appropriate information about the end customers; retailers became more proactive in their approach (Aktas & Meng, 2017). Study of also Dekimpe (2020) also indicated that implications of Big-Data also foster opportunities throughout the value chain. Although there are three challenging processes associated with retail business i.e. assortment, pricing and store layout. Among these three assortments and pricing require massive mental exercise as they might be influenced by

demand elasticity, customer preferences and store location etc. Therefore, effective quantitative analysis is required to predict the impact of Big-Data on these two processes. However, store layout is also a worthwhile variable to be explored in terms of effect of Big-Data as the process can influence consumer buying behavior (Aktas & Meng, 2017).

### **A** *Effect of Big-Data on Store Layout*

Store Layout has a significant impact on sales especially in the retail sector. It has also been indicated that layout might increase sales volume on the basis of per square foot of available space (Liao & Tsai, 2019). Store Layout has found to have significant impact on consumer purchase decisions therefore it's is potent enough to be explored in terms of its relationship with Big-Data (Aktas & Meng, 2017). Store Layout is usually used to indicate the size and location of different departments, structures, fixtures, any permanent structures and patterns used to highlight customer traffic (Liao & Tsai, 2019).

During past sampled customers were treated as the base of decision regarding the in-store behavior which is used to optimize store design and shelf layout (Aktas & Meng, 2017). Though task needs thorough efforts as keen observation of videos, mobile services, WI-FI, and RFID tags were used to track customer's in-store location. Moreover in-store location of customer is not a true predictor of consumer behavior however able to predict the correlation of in-store movement with sales (Aktas & Meng, 2017). However, the sales of retail outlet can further be strengthened by effective management of shelf space and optimization of space of movement i.e. Aisle Design (Dreze, Hoch & Purk, 1995)

### **B** *Aisle Design*

Effective designing of personal spaces in retail tends to influence retail experience as well as choice of purchase (Bittner 2002 & Turley & Miliman, 2000). These postulates are supported by Levay and Zhu (2009) availability of space inside store influences the decision of purchase. However, in most of the retail stores straight floor plan is used as best way to optimize customer's satisfaction and sales. The plan is also treated as most economical plan for optimizing store layout. However, hybrid of straight, diagonal and angular floor plans i.e. mixed floor plans has been proposed by GoHikings. The plan is the best possible solution for retail stores that prefers self-service and foster smooth flow of traffic and also provides excellent visibility (Liao & Tsai, 2019).

### **C** *Unavailability of Skilled Data Scientist*

A study of Iqbal Kazmi Manzoor Soomrani Butt and Shaikh (2018) indicated that the prime reason for shortage of in-house data management specialists is linked with an uncertain return on investment from big-data analytics. However, lacking of qualified data scientists and high cost of staffing are also included in the list of potent reasons for shortage of in-house data management specialists. Although data scientists must also have an adequate inventory of skills in order to deal effectively with the extraction of knowledge (Dolezel & McLeod, 2019).

Large firms manage that through allocating work to different people having expertise in different areas in order to cope up with the shortfall. Though small and medium sized enterprises (SME) face a lot of difficulties in managing the same as they need cross sectional experts who may deal with issues of IT as well as from the domain of business (Iqbal et al., 2018). Databases now can store in-store movement of customers through connecting their in-store movement during purchase. Therefore, there is a continuous flow of information to retailers which aids in making real-time decisions like inventory, re-socking and orders become easy. Thus, aids in making solution which is directly associated with point of sale systems as data have been generated through combination of sources and aids in understanding patterns of customer movement (Bradlow, Gangwar, Kopalle & Voleti, 2017).

#### **D Shelf Design:**

Shelf (Placement) Design is actually the allocation of products in a way that the placement will aid in increase of sales and profitability. Thus, location of product has the motive to fix the space allocation and also has a potent role in resolving issue of customer engagement in retail stores (Rautaray et al., 2017). Shelf Spacing Problem was addressed in 1960 however after 2000 there was a significant growth in number of publications that are coherent with the issues of shelf planning (Bianchi-Aguiar, Hubner, Carravilla & Oliveira, 2020). However, shelf design remains one of the active fields of research in the retailing though available set of knowledge does not seem to be aligned with practices (Bianchi-Aguiar, Silva, Guumaraes, Carravilla, Oliveira, Amaral & Lapela, 2016).

Studies like Soliman Janz Prater Frazier and Reyes (2005) also highlighted that the problem of shelf design has been more dominating for grocery stores the issues of shelf management are more potent than other forms of retailing. In fact, effective management of shelf space only improves level of customer satisfaction but also optimizes the return on investment made on inventory by reducing the out of stock occurrences (Yang, 2001).

Study also posited that price of product must be determined after gauging its shelf life as it will provide a good idea regarding the extent of discount that might be given (Rautaray et al., 2017). On the other side immense growth rate in publications associated with shelf design has been observed from 2010 and up till now more than 70 articles have been published in reputed journals. However, still there is no work that is specifically focused on space planning and models of purchase also vary shelf design (Bianchi-Aguiar et al., 2020). Therefore, significance need to devise literature as well as mechanism for better shelf design as it fosters sales as well as profitability of retail sector (Rautaray et al., 2017)

## **6 Research Methodology**

Research Methodology is the generic logic linked with epistemology and ontological assumptions (Long, 2014), thus aids in conducting research (Sileyew, 2019). Use of methodology also aids in defining best way to reach conclusions through results (Long, 2014). Moreover, Methodology is the hybrid of parameters researchers undertake to show relevance among all the potent aspects of the study (Brannick & Roche, 1997). Therefore, the section has been divided into

two sections i.e. Research Design and Sampling Design in order to relate it with the indications of well-known authors of the field like Saunders Lewis Thornhill and Wilson (2009) etc.

### **A Research Design**

Research Design outlines the study from assumptions made by researcher till the findings and analysis thus treated as the strategy or structure which aids in finding answers to research questions (Kothari, 2004). However, there is a requirement of philosophical stance to predict most effective method for data collection (Zukauskas & Vveinhardt & Andriukaiteiene, 2018). Hence realism has been incorporated as the philosophical stance as it has the ability to be associated with qualitative as well as quantitative research (Saunders Lewis & Thornhill, 2012). Research strategy is survey (Saunders et al., 2015) and studies done on this domain like Aktas and Meng (2017) and method of data analysis is mono-method (Saunders et al., 2015). The purpose of the research is correlational (Sekaran & Bougie, 2016) & time horizon is cross-sectional; Saunders et al., 2015 & Sekaran & Bougie, 2016).

### **B Sampling Design**

Sampling is not only done in order to decrease cost associated with the process of research (Leedy & Ormrod, 2005) and thus one may realize the need to include specific units in the study rather than entire population (Mugenda, 2003). However, data must be coherent with the research questions and targeted survey is one of the best and most suitable option to collect data (Moorman, 2016). Though, due to in-house analytical department retail giants do not feel any potent need to share data with academia. In fact, for some of the discipline it has been already mentioned that academic practitioners must not try to intervene in research which might be done more effectively by the pragmatic world (Dekimpe, 2020).

Thus, this study uses primary data for analysis through taking the reference of Aktas and Meng (2017) who conducted data through interviews from the expert of the industry. The sampling design is also effective as in Pakistan most of the retailers are dealing in FMCG (IBM, 2018) and store design is more potent for retailers dealing in grocery items (Soliman et al., 2005). Hence through linking all of these points study uses the quantitative approach to conduct research as used by Le and Liaw (2017) and Seetharaman Niranjana Tandon and Saravanan (2016). The method of sampling used is quota sampling which is treated as best option to deal with slow response rate and higher cost of sampling (Yang & Banamah, 2014).

Thus, this study includes those IT experts which are working in senior positions in organized retail sector of Karachi and know the use and application of Big-Data. However, previously there was almost no prior study which is from eastern and developing side of the world and use quantitative measures for analysis. Therefore, in association with Pathirage, Amaratunga and Haigh's (2008) study is linked with theory building therefore the sample is of fifty (50) respondents.



### **C**      **Questionnaire**

This study uses closed ended adapted questionnaire based on the elements indicated by Le and Liaw (2017) and Seetharaman Niranjana Tandon and Saravanan (2016).

However, to device questionnaire on store layout, indication made by Aktas and Meng (2017) and Valchanov (2017) were also incorporated in the instrument. Study also has a mediator i.e. skills and abilities of data scientists, therefore, the instrument also includes parameters by De Mauro Greco Grimaldi and Nobili (2016) and Glass & Callahan (2014).

### **D**      **Software**

Grewal et al. (2017), indicated way through which Big-Data might foster the business of the retail sector. The sector is also significantly important for Pakistan due to 17% contribution to country's GDP (Ahmed et al., 2012) though it's been massive ignorance towards the technology in Pakistan due to lack of knowledge and difference of culture as compared to the western world (Gallop Pakistan, 2018). Thus, this study must be treated as theory building approach hence SMART-PLS is incorporated due to its ability to deal with similar sorts of conditions (Sinkovis, Richter, Ringle & Schlaege, 2016). Software is also treated as one of the better options for statistical trusting in recent times, especially for the studies linked with management sciences (Benitez, Henseler, Castillo & Schuberth, 2020).

## **7**      **Statistical Testing And Analysis**

SMART-PLS incorporate two types of models for the purpose of statistical testing one is known as confirmatory (inner) model and the other one is known as (outer) measurement model and Benitez et al. (2020). For this study the measurement model is of reflective nature and thus it must be supplemented with indication of Afthanorhan (2014). On the other side Benitez et al. (2020) suggested that store layout is included in the list of top three challenges for the retail sector

**A Outer Loadings****Table 1: Outer Loading**

	Aisle Design	Big Data	Moderating Effect 1 SDS	Moderating Effect 2 SDS	Sales	Shelf Design	Skilled Data Scientist
AD1	0.809						
AD2	0.768						
AD3	0.704						
AD4	0.757						
AD5	0.719						
BD1		0.762					
BD2		0.767					
BD3		0.710					
BD4		0.649					
BD5		0.791					
Big Data * SDS				1.119			
Big Data * SDS			1.119				
S1					0.776		
S2					0.801		
S3					0.811		
S5					0.678		
SD1						0.743	
SD2						0.764	
SD3						0.775	
SD5						0.682	
SD6						0.756	
SD7						0.771	
SDS1							0.714
SDS2							0.820
SDS3							0.768
SDS5							0.807

Hair Sarstedt Ringle and Mena (2012) indicated that each element associated with variable must predict at least 0.5 of the variance & the least acceptable value for outer loading of each element is 0.708. However, 0.60 is the least value for outer loading for any element and elements having outer loading between 0.6 and 0.7 might be included in the model (Afthanorhan, 2014) though the inclusion became more effective with the values getting closer to 1 (Khan, Sarstedt, Shiau, Hair, Ringle & Fritze, 2019).

In this study the least value of outer loading for any element is 0.649 and it is for only three elements for different variables therefore legitimate to include these elements in confirmatory (inner) model.



## B R Square

**Table 2: Predictive Accuracy**

	R Square	R Square Adjusted
Aisle Design	0.720	0.664
Sales	0.936	0.935
Shelf Design	0.591	0.554

Table 2 is indicating predictive accuracy which is the measure of variation in dependent variable through change in independent variable. Benitez, Henseler, Castillo and Schuberth (2020) also indicated the same that purpose of R-Square is to reflect the predictive accuracy of dependent variable through ordinary least square. However, the method for the analysis is same as of regression (Andreev, Heart, Moaz & Pliskin ,2009) and 0.26 is the least acceptable value for reflective predictive accuracy (Cheah, Memon, Chuah, Ting & Ramayah, 2018). On the other side Henseler, Ringle and Sinkovics (2009) and Hair Ringle and Sarstedt, (2013) indicated 0.5 and 0.75 as the moderate and substantial fit. In this study the value of R2 for 0.720 for Aisle Design., 0.591 for Shelf Design and 0.936 for Sales. Therefore, it is indicated that for two-stage model the values of all the variables are either moderate fit of substantial fit.

## C Construct Reliability and Validity

**Table 3: Construct Reliability and Convergent Validity**

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Aisle Design	0.808	0.812	0.867	0.566
Big Data	0.740	0.755	0.826	0.581
Moderating Effect 1 SDS	1.000	1.000	1.000	1.000
Moderating Effect 2 SDS	1.000	1.000	1.000	1.000
Sales	0.767	0.771	0.852	0.590
Shelf Design	0.789	0.805	0.849	0.570
Skilled Data Scientist	0.735	0.764	0.820	0.535

Table 3 is highlighting construct reliability and convergent validity. For construct reliability it has two reliability measures i.e. Cronbach's Alpha ( $\alpha$ ) and Goldstein's rho and for Convergent Validity it has Composite reliability and AVE. The combination of Composite Reliability and AVE has also been termed as Convergent Validity by (Sijtsma, 2009).

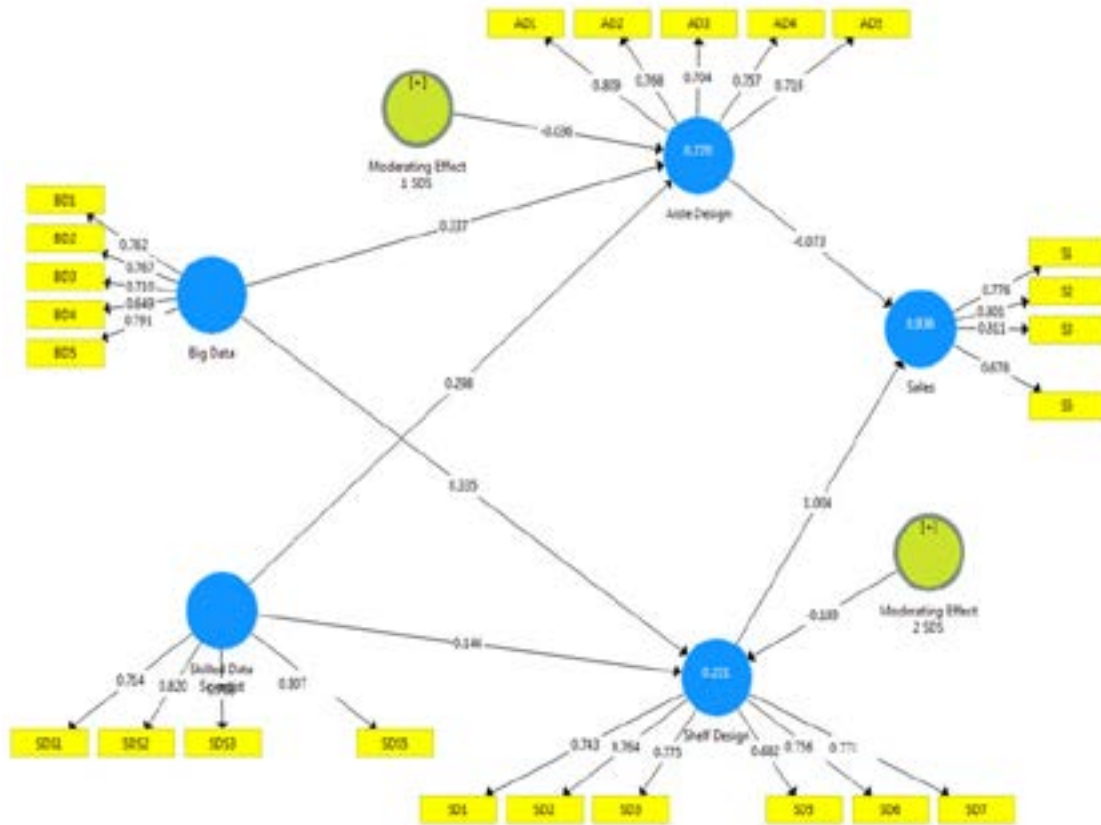


Figure 1: CFA & Outer Loadings

**D Heterotrait-Monotrait Ratio (HTMT)**

Table 4: Discriminant Validity via Heterotrait Monotrait Ratio (HTMT)

	Aisle Design	Big Data	Moderating Effect 1 SDS	Moderating Effect 2 SDS	Sales Design	Shelf Data Scientist	Skilled Data Scientist
Aisle Design							
Big Data	0.531						
Moderating Effect 1 SDS	0.084	0.081					
Moderating Effect 2 SDS	0.084	0.067	0.482				
Sales	0.583	0.433	0.258	0.258			
Shelf Design	0.686	0.514	0.265	0.265	0.583		
Skilled Data Scientist	0.462	0.384	0.184	0.184	0.234	0.345	

Table 4 is highlighting discriminant validity through indicating Heterotrait-Monotrait Ratio (HTMT). The purpose of this measure is to highlight the difference in variables of the same construct via values of correlation (Cheung & Lee, 2010). The maximum value of correlation which might justify HTMT ratio is 0.85 and any value greater than 0.085 is out of the context of discriminant validity as far as HTMT ratio is concerned. (Hair Jr, Sarstedt Ringle and Gudergan, 2017)

### **E Mean, STDEV, T-Values, P-Values**

**Table 5: Path Coefficient and Total Effect**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Aisle Design -> Sales	-0.073	-0.072	0.017	4.290	0.000
Big Data -> Aisle Design	0.337	0.343	0.049	6.940	0.000
Big Data -> Shelf Design	0.335	0.341	0.051	6.557	0.000
Moderating Effect 1 SDS -> Aisle Design	-0.036	-0.036	0.063	0.567	0.571
Moderating Effect 2 SDS -> Shelf Design	-0.189	-0.192	0.055	3.437	0.001
Shelf Design -> Sales	1.004	1.004	0.050	20.08	0.000
Skilled Data Scientist -> Aisle Design	0.298	0.305	0.050	5.904	0.000
Skilled Data Scientist -> Shelf Design	0.146	0.146	0.052	2.807	0.005

Table 5 in association with figure 2 is used to indicate the impact of independent variable (Big-Data) on dependent variables (Aisle Design and Shelf Design for 1st Sage) & Sales of retail (for 2nd stage).

The impact is highlighted through inferential statistics which is one of the prime components of reflective models used through SMART-PLS (Hair, Risher, Sarstedt & Ringle, 2019). However, table 5 is reflecting inferential statistics through using t-values (Duarte & Amaro, 2018) & p-values (Kock & Hadaya, 2018) which mean both of these measures must be found effective to ensure the effect of independent variable (Big-Data). Hair Ringle and Sarstedt (2011) indicated that minimum t-value required to highlight effect is 1.97 and maximum value of p which may satisfy the condition is 0.05 (Kock & Hadaya, 2018). Hence in the light of above-mentioned references it has been legitimate to believe that all variables including moderation of skilled data scientists do have a significant impact except the moderation of skilled data scientists with big-data on aisle design.

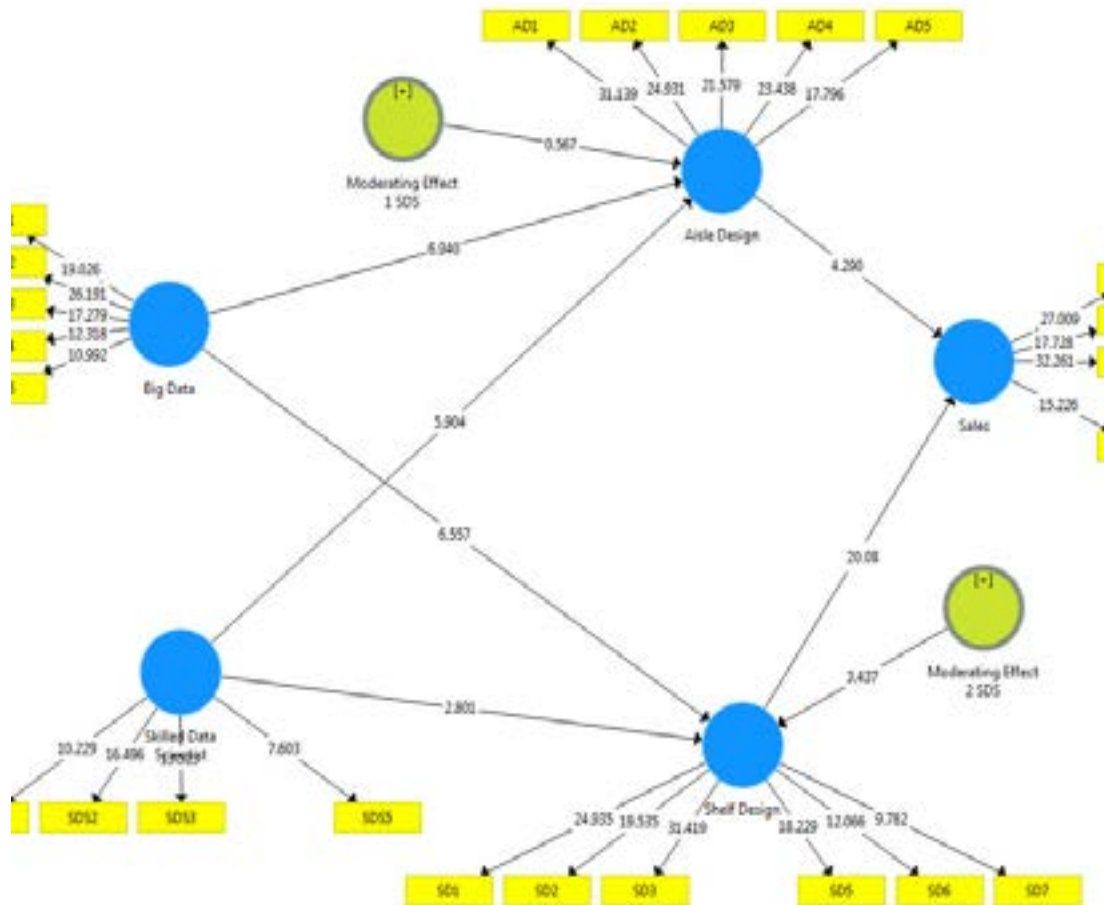


Figure 2: Path Coefficient

## 8 Conclusion and Discussion

On the basis of detailed statistical testing, it has been obvious that use Big-Data is perceived as fruitful for the optimization of store layout by IT specialists of organized retail sector. Therefore, it is also effective to indicate that findings of the study are coherent with the indications of Aktas and Meng (2017), that store layout has been affected significantly through the use of Big-data. Dekimpe (2020) also indicated that store layout is included in the three top challenging elements for retail as findings of this study looks to be most potent in devising store layout models through Big-Data. These implications seem to be potent enough as digital data is increasing day after another (Hajirahimova & Aliyeva, 2015).

Though unstructured data is making data beyond the control of databases (Aktas & Meng, 2017) and even articles which are focused on shelf design do not seem to be indicating similar models (Bianchi-Aguiar et al., 2020). However, overall sales of outlets might be improved through better designing of shelf and Aisle (Dreze, Hoch & Purk, 1995). Therefore, in the light of these parameters use of Big-Data for the optimization of store layout is one of way to devise

a model which has higher adaptability and also can optimize sales. Similar has been highlighted by Aktas and Meng (2017) that store layout is a worthwhile variable to be explored in terms of its association with Big-Data. On the other side Big-Data is also used to device marketing mix elements (Cao & Manrai, 2014) this in organized retail it is one of the most effective tools of in-store marketing (Avinash \* Babu, 2018).

Moreover, it has been used to take a competitive edge not only by giants of online retail e.g. Amazon but also by the giants of organized retail Walmart (Cao & Manrai, 2014). Thus, the linkage developed through this study is potent enough to be related to the sales of retail industry.

## **9 Area For Future Research**

Research is one of the initial studies which tries to explore the effect of Big-Data in the field of marketing and retail sector of Pakistan via quantitative technique. Although study uses the reference of IT experts through using loose quota sampling. However, for optimization of results, further studies might be conducted through having the secondary data regarding the use of Big-Data or large data by organized retail sector on their sales.

Furthermore, study has also been conducted from the retail segment of Karachi and comparative analysis of different cities and provinces through the application of big-data in retail might provide a better way of understanding.

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