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IMPACT OF BIG DATA ANALYTICS ON DECISION MAKING AND ORGANIZATIONAL PERFORMANCE

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ABSTRACT

While big data analytics is being increasingly used to gain data-driven insights to support decision-making, little research exists regarding the impact of Big Data Analytics on decision-making and effectiveness of decisions on organizational performance. Drawing on the information processing view and survey based ratings; this paper develops a research model linking Big Data Analytics to organizational decision-making effectiveness and performance of organizations in manufacturing sector of Republic of Uganda. Study uses the Simon's decision making theory to lens the intellectuals of big data analytics and decision making. Paper aims to correlate BDA with decision making of an organization and aims to observe the level of impact of BDA on decision making. For the purpose manufacturing industry of Republic of Uganda has been selected. Data collection will be based on self-made questionnaire. Statistical treatment of the data finds that Big Data Analytics positively influences the decision making capabilities and effectiveness of organization. The findings also demonstrate that the paths from Big Data analytics to decision-making effectiveness have no statistical differences between large corporations and medium sized enterprises. Our findings contribute to managers' knowledge and understanding by demonstrating how decisions can be more effective using Big Data Analytics.

INTRODUCTION

Big Data is extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions. "Big Data Analytics has turned out to be a very well-liked term in practitioner and academic conferences, journals and books. In spirit, the term ancestry in the fact that data generated and accessible today is 'big' in terms of volume, variety, and velocity" (Davenport, 2014). Big Data has gained wide notice since the first foreword of the definitional statement in which they were described as "high-volume, high-velocity, high-variety, high-veracity and high-value" information assets that demand cost-effective, ground-breaking forms of information meting out for enhanced insight and decision making". While there are convincing Big Data Analytics success stories, there are considerable costs and other challenges involved with Big Data (initiative), that many organization fail to afford and so far there has been no larger scale experimental evidence of net benefits. For that reason, research question of the paper is: Does Big Data Analytics lead to superior performance and therefore competitive advantage in manufacturing industry of Republic of Uganda with information driven decision making? Successful business stories come with intellectual and innovative steps of decision made on authentic and accurate information. Quality of data to improve productivity effectiveness of a business system is competing need of manufacturing industry. Decision system of organizations transforms input data into usable information and this information based on reliability of data is converted into Knowledge that supports information driven decisions. Unfortunately, conventional DSS and Business Intelligence methods necessitate in excess the application of basic archival data and simple analysis techniques in order to foresee future decisions, to identify bias or to discover new opportunity. The big data analytics market is set to reach $103 billion by 2023, currently in 2019 every person is generating 1.7 megabytes of digital data in just a second (Hsinchun Chen, 2012). Despite the bleak economy Big Data is "Big Opportunity" for large and medium sized corporations, with considerable "Big Cost". Intelligent business decisions lead to innovative and proactive approach of solving problems and converting those problems in opportunities.

Volume, velocity, variety, veracity and value, characteristics of Big Data establishes causal relationship with intelligent and information driven decisions. Study intends to investigate the relationship of "5Vs" of Big Data & Decision making in manufacturing industry of Republic of Uganda and tends to answer the question to what extent these characteristics of Big Data influence the organizational performance. Need for high volume of data for better

and integrated decision making system is never been challenged, it other 4Vs that can make difference in usage of high volume of data. To understand the customers' buying habits, potential of data driven marketing & reevaluating the risk portfolio quickly variety and veracity of information is necessitated.

Business data keeps on increasing and the enterprises can access various types of data that may be collected from various sources like mobile devices, social media pages, websites, and other passive or active data sources. Collecting all that data through tools and techniques of big data and making decision making process improves real time relation with customers, enhances efficiency of business operations and no extra investment with increased performances of organizations.

S. No.	*Tools & Techniques*	*Description*	*Decision Making*
1	Apache Hadoop	*Clustered file system and handling of big data (MapReduce programming model).* *Holds all type of file system (Video, Images, Text and XML etc)*	*For identifying consumer patterns and online buying behavior of consumers Hadoop tool is used by 50 top most companies*
2	**Cloudera Distribution**	*open source/free platform distribution for Apache Hadoop, Apache Spark, Apache Impala* *Less complex and high secure governance*	*Used by many agencies for financial service management decision making and service sector for secure environment of achieving big data on consumers*
3	Cassandra	*Open source/NoSQL DBMS* *Structured queries* *Fast, long array for storage, massive database and simple and linear scalability*	*Extra effort required for trouble shooting and maintenance/ only large scale organizations use it to make strategic decisions*
4	Knime	*Konstanz Information Miner/ high integration of languages and technologies/automates manual work*	*Used for Enterprise reporting, integration, research, CRM, data mining, data analytics, text mining, and business intelligence.*
5	Datawrapper	*Data Visualization/simple, precise and embeddable charts production/ Handling Image data with accuracy*	*Used by online service providers for marketing based operational decisions environment*

Table 1 Five most used tools of Big Data Analytics

BACKGROUND

GDP from manufacturing in Uganda increased to 1199.01 UGX Billion in the second quarter of 2019 from 1157.95 UGX Billion in the first quarter of 2019. GDP From Manufacturing in Uganda averaged 985.69 UGX Billion from 2008 until 2019, reaching an all-time high of 1199.01 UGX Billion in the second quarter of 2019 and a record low of 787.93 UGX Billion in the second quarter of 2008 (Ara, 2019). Big names come in play with large capital and operational cost when it comes to manufacturing industry of Republic of Uganda though Uganda is less developed and less appreciated economy to invest as compare to neighboring countries. Republic of Uganda has remained in financial crunch since last 10 to 20 years, many shut down the business operations and many downsized the employees to sustain economic turmoil. Battling internal vandalism and street crimes, Government of Uganda is extending the expenses to strengthen the defense system against such threats, where industrial sector

has to burden heavy taxes on import of raw material, purchase of energy & purchase of Fuel to run the manufacturing units.

US Dollar ($) appreciation in terms of rupee had made the conditions more tough for financial system to sustain and provide subsidies to corporations. Big Data Analytics is not a choice is necessity for manufacturing Industry of Uganda to refine and execute efficient decisions.

Choice of business-continuation is a prevalent decision in Uganda's manufacturing industry that can burn cash in seconds; the need of high volume of data with accurate and reliable information has become more demanding in this situation. Make or buy, downsize or sustain, shutdown or remain open & operational decisions need intellectual insights. "Big Data" with "Big Cost", itself is a "Big Decision" to make, especially in prevalent conditions of manufacturing sector of Uganda where profits are diminishing. Investigation of the empirical need of intelligent decision making system to convert problems into the opportunities require immense patience and literary background to convince the business systems that opportunity cost is worth to imply as results are greater and efficient. Sensing the need of Big Data Analytics and intelligent decision making systems for industrial transformation, research locale is set in "Biggest" city of Republic of Uganda, Kampala (Industrial Hub/Labor Zone). 70 % of manufacturing industry of Republic of Uganda is located in Kampala, some of the Big names of the industry as Accurate Weighing Scales Ltd. Manufacturing, Davis & Shirtliff International Limited. Construction, huigoo Optic Co. Limited, Mertz investments ltd. Manufacturing, Wasib Solutions Limited, Supplies, Ajanta Export Industries and Manufacturing, Deha Investees Ltd. Construction are operating in industrial zone of Kampala, Republic of Uganda, with the population of 1,650,800. Study presents the results based on the survey conducted in Kampala industrial zone selecting 10 manufacturing corporations, with capital enough to afford "Big Data Analytics". Steele & Cotton is the main manufacturing units of Uganda economy.

Uganda obtained independence from Britain in 1962, emerging as a poor agrarian economy dominated by agriculture. After a decade of economic and political stability, in 1971 Idi Amin led a military coup, initiating a period of political and economic chaos lasting until 1986. The National Resistance Movement led by Yoweri Museveni took power, and has remained the ruling political organization since. During the first two decades of rule, economic development was significantly hampered by civil war in the North. A period of relative peace has followed, even though improvements in peace and stability mask substantial governance concerns rising inequality, youth unemployment, and corruption in public office. Against this background the recent performance of the Ugandan economy is impressive GDP growth averaged 6.5 per cent per annum in the 1990s and 2000s. The growth experienced is simultaneously associated with impressive economic trends and depressing levels of industrial transformation. Against this background the recent performance of the Ugandan economy is impressive GDP growth averaged 6.5 per cent per annum in the 1990s and 2000s. The economy also appears to have weathered the global financial crisis well, with a growth rate of 5.3 per cent in 2013, predicted to increase to 6 per cent for 2014 (World Bank 2014) and projected to increase to 6.3 per cent according to the National Development Plan II (Republic of Uganda 2015).

LITERATURE REVIEW

Larger the data set more difficult it becomes to manage (Russom, 2011). Big data refers applies to the data bases which grow so large that traditional database management system become awkward to work with, moreover the size of big data is beyond the ability of the commonly used techniques to manage, store and process data (Sumant, 2016). Three main features characterized with big data: volume, velocity and variety (Bifet, 2012), explained volume as the size of data, velocity refers to the rate at which data is changing and variety means the different formats and types of data, all which are important for making decision in an organization. Further IBM added 4th V; veracity (Jagadish, 2015), additionally the value of data is considered the 5th V by some researchers when it comes to the decision making (Chang, 2013). Big data analytics is the where advanced analytics technique are applied to big data sets. Larger data sets come with greater issues and challenges (Russome, 2011). Sophisticated analytics can improve decision making, minimize risks and uncover valuable insights. Managerial decision making has been important and thoroughly covered by many researchers throughout the years. Simon's four phases of decision making: intelligence, design, choice and implementation are popularly adopted by different decision makers in different domain (Santoso, 2017). Furthermore according to (Jagadish, 2015), there are many

steps to big data analysis pipeline and each step comes with its challenges and required decision. These decisions range from how to acquire data, which data to be acquired, representing data in suitable manner for analysis after extraction and how to make decisions on acquired information. Further, Santoso (2017) observe that data-driven decision-making strategy leads to changes in organizational culture, leadership, human resource management and other management practices.

These changes could result in stronger customer relationships, lower management risks, and improved operational efficiency, which could ultimately improve a firm's competitive position (Davenport, 2014). From strategic management perspective, big data is increasingly viewed as enterprise assets, which is critical for organizational success (Russom, 2011). It must be aligned with other resources and capabilities and configured in a manner that not only aid decision-making but improve organizational performance and provide sustained competitive advantage (Bean, 2013).Moreover the decisions require improvement in the process yet to influence of the effective output (Khaista Rahman, 2017), especially for the country like Republic of Uganda , underdeveloped economy.

Synthesis of literature concludes that theoretical and practical approach of data refinement and data assembling is different in some studies whereas some present same approaches. Information driven decision making has become need of every corporation for which Big Data Analytics provide the insights and techniques to improve on the manual data mining and decision making algorithms.

THEORETICAL FRAMEWORK

The general aim of decision making in the era of big data is to reduce large-scale problems to a scale that humans can comprehend and act upon. To this aim there are important challenges that must be addressed (Cook L. A., 2018). As stated in Fawcett (2013), data analytics is gaining increasing attention in business and consequently also Data-Driven Decision-making (DDD), which refers to the practice of basing decisions on the analysis of data, rather than on intuition. Data-centered world interpretation as well as data-centered decision-making opens up many possibilities. (Liu, 2016) has shown that the processes of decision making in organizations have evolved from a cognitive point of view which began with Simon's model 1977. Simon set out to investigate that rational decisions are influenced by administrative context and behavioral traits of administration, known as "Universal Decision Maker" provided the early basis of the decision pertaining information influenced decisions (Lu, 2001). Herbert Simon (1977) made key contributions to enhance our understanding of the decision-making process. In fact, he pioneered the field of decision support systems. According to Simon (1960) and his later work with Newell (1972), decision-making is a process with distinct stages. He suggested for the first time the decision-making model of human beings. His model of decision-making has three stages: Intelligence, Design and Choice. Latest science of data driven decision making and information based decisions are, contribute high volume and high value of information to all three phases of Simon decision making model (Ara, 2019).

Intelligence, deals with identifying problem and collecting data on subject; Design deals with alternative solutions of problems; choice deals with right decision to make to overcome problem and converting it to opportunity (Newell A. S., 1958). Human skills are not able enough to comprehend the huge amount of data and convert it into the sensible, intelligent and effective decisions. Philosophers over the period of time exhibited different stages of decision making, each step require thoughtful and proactive approach based on knowledge and refined data to be effective. Big Data Analytics provided that luxury of comprehending information to support information driven decision making (Augier, 2000).

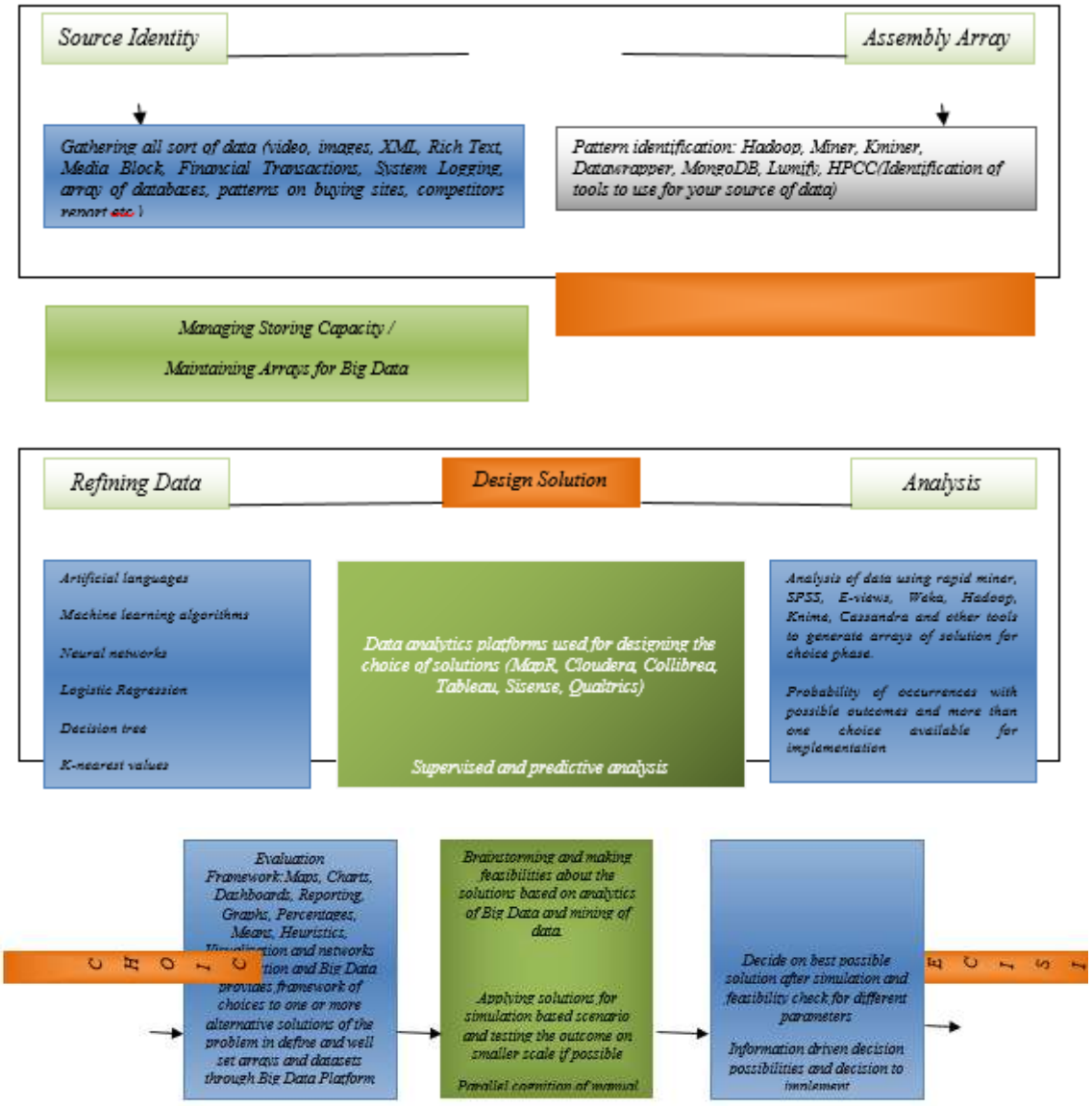

Figure 1 BDA-DM Framework based on Simon's Decision Model, 1977

CONCPETUAL FRAMEWORK

Study conceptualizes Simon's decision making model and uses Big Data Analytics to determine the impact of volume, velocity, variety, veracity and value, as independent variables, on information driven decisions. Characteristics of Big Data Analytics are positively associated with all three phases (Intelligence, Design, and Choice) of Simon's Decision Model. Problem solving or Effective way of addressing the crucial situation requires immense concentration and brain-storming that can lead to decisions resulted either way for corporations (Bean, 2013). Success depends on the source and authenticity of information, based on decisions justifies the reasonable solutions, governed later by administration through concrete controlled implementations that defines organizational performance (Adnan, 2017).

High Volume of digital data made it easier to create alternative solution data sets for managers and executives, though variety choice of information in human genius and limited intuition towards selection of answers to problems (Cook L. A., 2018). Current competitive market based decisions in manufacturing based industry of Republic of Uganda need to be not only smart but also timely, as market is saturated with rivals and competing agencies waiting for leverage to gain customer base and loyalties. For the cause, velocity and value characteristics of Big Data necessitates the business intelligence to timely address the problems and opportunities. Study uses decision making as the dependent variable influenced by "5Vs" of Big Data and establishes co-relation of decision making with organizational performance.

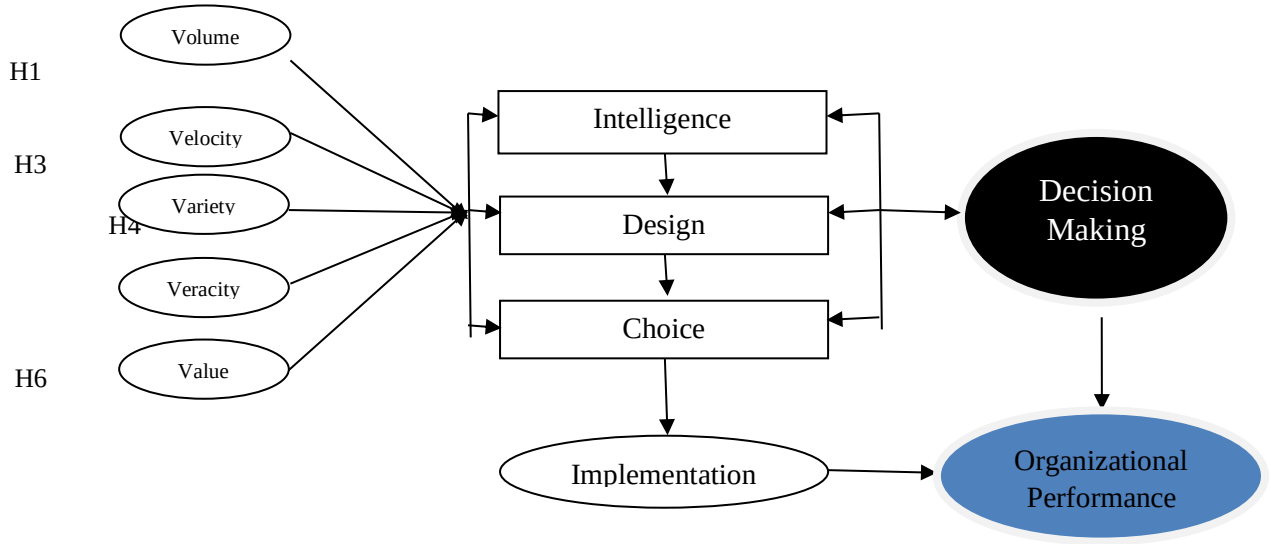

Figure 2 Conceptual Framework Based on Simon's Decision Making Model 1977

HYPOTHESES

On the basis of conceptual framework and related theories of Big Data Analytics and decision making model, study designed following null hypotheses:

$H_0$1: There is no significant relationship between volume of information in Big Data Analytics and decision making of the organization in manufacturing industry of Republic of Uganda.

$H_0$2: There is no significant relationship between velocity of information in Big Data Analytics and decision making of the organization in manufacturing industry of Republic of Uganda.

$H_0$3: There is no significant relationship between variety of information in Big Data Analytics and decision making of the organization in manufacturing industry of Republic of Uganda.

$H_0$4: There is no significant relationship between veracity of information in Big Data Analytics and decision making of the organization in manufacturing industry of Republic of Uganda.

$H_0$5: There is no significant relationship between value of information in Big Data Analytics and decision making of the organization in manufacturing industry of Republic of Uganda.

$H_0$6: Decision making of manufacturing industries in Republic of Uganda is positively correlated with the organizational performance

RESEARCH METHODOLOGY

Study uses quantitative design, survey based, through self-made 5 Likert scale questionnaire to investigate the effects of "5Vs" (Independent variable) on the decision making (dependent variable). For the purpose of the survey, 10 famous corporations from manufacturing sector of Republic of Uganda were selected, based on running and operational capital affordable enough for the Big Data Analytics installation and management cost. Paper and pen pencil procedure was adopted to conduct survey from participants (Executives, Directors, and Managers) of the study. Study followed ethical consideration of inform consent and secrecy of participants to ensure unbiased primary data collection.

S/No.	***Categories***	***Numbers***	***Percentage***
1	Executives	10	7.19%
2	Board of Directors	30	21.58%
3	Managers	89	64.08%
Total		139	100%

Source: Survey Data @ 2019 Labor Zone, Kampala, Republic of Uganda

Table 2 Composition of Sample

Slovin's formula was applied to sample the participant size from the population (known) size, producing 139 sampled participant of the study (see table 2). Participants were randomly selected once the sample size was established from manufacturing corporations of Republic of Uganda. Participants were briefed about the study objectives and given orientation regarding questionnaire. 5 likert scale questionnaire from strongly disagree to strongly agree (from 5 to 1) were presented to participants.

S/No.	***Scale***	***Categories***
1	1 to 1.49	Strongly Disagree
2	1.50 to 2.49	Disagree
3	2.50 to 3.49	Neutral
4	3.50 to 4.49	Agree
5	4.49 to 5.0	Strongly Agree

Table 3 Impact Ratings of questionnaire

RELIABILITY ANALYSIS

Before collecting complete data from (139) participants', reliability test was conducted to authenticate the questionnaire. 20 recipients were selected from the sample and distributed the questionnaire for initial test, "Cronbach's Alpha" value for all 5 categories of the questionnaire surpassed .70 or 70% required percentage. Table 4 exhibits the values of Cronbach Alpha for volume, velocity, variety, veracity and value, which implies that categorically all the values of reliability test surpassed required results, hence questionnaire proved reliable for further process.

S/No.	***Variables***	***No.***	***Cronbach's Alpha***	***%***
1	Volume	20	.843	84.3%
2	Velocity	20	.789	78.9%
3	Variety	20	.913	91.3%
4	Veracity	20	.904	90.4%
5	Value	20	.872	87.2%
6	Overall	20	.901	90.1%

Table 4 Reliability Analysis Test

HYPOTHESES TESTING

Null hypotheses were testes for *t*-values and *p*-values, in order to nullify the null hypotheses and accept study hypotheses. Independent sample test (2 tailed) applied for rejection of null hypotheses exhibited in table 5. Further Kurtosis test was applied for more confirmation of nullifying the null hypotheses in the study. Table 4 exhibits *t*-values and *p*-values of independent sample 2 tailed tests, t_{Volume} = 3.4081, $t_{velocity}$ = 2.39, $t_{variety}$ = 2.67, $t_{veracity}$ = 1.99 and t_{value} = 2.34, all the values are greater than *t*-table values for degree of freedom @ 138. Values exhibited in table 4 imply that all null hypotheses of the study are rejected and study hypotheses are accepted. *P-values* exhibited in table 4 are less than .50 which implies model is significant different and fit for prediction.

S/No.	***Factors***	***numbers***	***t-test statistic***	***P Value***	***t-table value***
1	Volume	6	3.4081	.012	> *T table value*
2	Velocity	7	2.3932	.000	> *T table value*
3	Variety	7	2.6723	.013	> *T table value*
4	Veracity	5	1.9987	.023	> *T table value*
5	Value	6	2.3456	.000	> *T table value*

Table 5 Hypotheses Testing (Independent Sample Test)

Results of the independent sample test (2 tailed) establishes argument that model is fit and null hypotheses of the study are rejected, qualitative expression for this narration is that "5Vs" of Big Data Analytics affect the decision making in manufacturing industry of Republic of Uganda though impact level of some of the characteristics are high and some are low. Further table 6 exhibits the Kurtosis test values for hypotheses testing to ensure the results of *t*-value statistics and *p*-value statistics.

S/No.	***Factors***	***Z value***	***Error***	***Z value/Error***	***Kurtosis Range***
1	Volume	2.567	.387	6.6330	Greater than +1.96
2	Velocity	1.897	.387	4.9018	Greater than +1.96
3	Variety	12.786	.387	33.038	Greater than +1.96
1	Veracity	2.431	.387	6.2816	Greater than +1.96
2	Value	6.781	.387	17.521	Greater than +1.96

Table 6 Kurtosis (Normality Test) for Hypotheses Testing

Table 6 exhibits values of skewness-Kurtosis, all values are greater than +1.96 as exhibited in table, which implies that data is normally distributed and null hypotheses are reject. Skewness is 0 for data normalization (see figure 3).

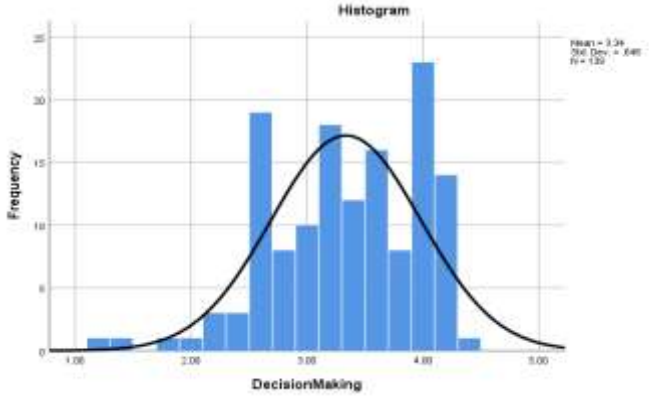

Figure 3 Histogram for normally distributed data

DESCRIPTIVE STATISTICS

Interpretation of mean ratings of the summary from the participant of the study (Executives, Directors and Managers) is covered in descriptive statistics section of the paper. Study used 5 likert scale ratings to record the ratings of the participant, sharing experienced based knowledge. Information driven decisions are dependent on volume of data, velocity of data, variety of data, veracity of data and value of data in this digital age. Problems come with opportunities and converting problems into opportunities is an art. Good "Decision Makers" often make "Big Mistakes" due to negligence and less acquired knowledge on background of the problem. Here intervene the Big Data Analytics insights for time saving and reliable acquisition of information on settings of problems.

Factors	**Executives**		**Directors**		**Managers**	
	Mean	Classification	Mean	Classification	Mean	Classification
Volume	3.9	A	3.2	A	3.1	A
Velocity	4.4	S.A	4.1	S.A	3.7	A
Variety	4.2	S.A	3.9	A	3.2	A
Veracity	3.3	A	3.5	A	4.3	S.A
Value	4.1	S.A	3.6	A	3.5	A

Table 7 comparison of mean ratings and classification

Table 7 exhibits value of mean ratings of Executives, Directors and Managers (Participants) on volume, velocity, variety, veracity and value of Big Data Analytics and impacts of these 5 characteristics of BDA on decision making of manufacturing industry of Republic of Uganda. Values of table 7 imply that all the participants are either agreed or strongly agreed with the statements of the questionnaire. Executives, directors and managers are key post holder in any corporation for decision making. Qualitatively expressed their opinion, in manufacturing industry of Republic of Uganda Big Data Analytics insights and usage may come with big cost but for longer

period is beneficial and resourceful asset for organizations. Information driven decisions can help from operation department to manufacturing unit, from financial department to information department and from quality control department to research & development department.

Normal sub heads of decisions in manufacturing industry are different than other services sectors; they require timely, quick, and effective decisions. In study conducted by Ara (2019) it was established that service and manufacturing industries have different nature of decision characteristics? Manufacturing requires more intense and thought consideration on problem solving attitude.

REGRESSION ANALYSIS

The linear regression was developed to investigate how one or more independent variables influence a dependent variable (Hutchinson, 2011). More specifically, in a linear regression analysis, the result produces one intercept and one slope, based on the mean, which represents the best fit for variable X to predict variable Y. The regression line can be calculated by using the equation (Noon, 2003): This study uses Volume, Velocity, Variety, Veracity and Value, characteristics of Big Data Analytics, as independent variable and decision making as dependent variable.

MODEL	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	.999[a]	.998	.998	.03304

Table 8 Regression Model Summary

Adjusted R square of the model is .998 that means .998 * 100 = 99.8 %. It implies that one unit of change in characteristic of Big Data will bring 99 % change in decision making. It also implies that model is highly predictable to dependant variable. Predictor is constant with R-square 99 %. Corporation decision making capacity is effectively and efficiently increases to 99.8 %, affected by Volume, Velocity, Variety, Veracity and Value. Decisions thus are information driven and more effective in linear model

	CHANGE STATISTICS				
MODEL	*R Square change*	*F – Change*	*Df1*	*Df2*	*Sig. F Change*
1	.998	27779.207	2	137	.000

Data source: survey data dated: October, 2019 @ manufacturing industry, labor zone Kampala industries

Table 9 change statistics of model

Table 9 explains R-Change is the same in change statistics as was in the summary model table 10, with f (2, 137) =27779.207, p=.000 model is significant and will bring change for sure as $P < .05$, it can be predict that model is significant and will bring changes in decision making efficiency of corporation for sure with the changes in all the independent variables. It implies that % change in Volume, Velocity, Variety, Veracity and Value will bring % change in decision making efficiency thus affecting corporate performance.

MODEL		*Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*
1	Regression	60.644	2	30.322	27779.207	.012[b]
	Residual	.106	137	.001		
	Total	60.750	139			

Table 10 Analysis of variance for decision making of manufacturing industry

Table 10 implies the analysis of variance in model.$\sum (Y_1\text{-}Y)^2 = 60.750$ for the mean difference square of predicted value of D.V and I.V and f (2, 137) =27779.207, *p*=.012, implies that model 1 of ANOVA is significantly fit to predict values and explain variation in factors. Qualitative expression for this variance implies that it can be predicted that Volume, Velocity, Variety, Veracity and Value will affect the information driven decision making for the organizations in manufacturing industry of Republic of Uganda.

MODEL		*Unstandardized Coefficient* *B*	*Std. Error*	*Mean Square*	*F*	*Sig.*
1	(Constant)	.111	.044		2.536	.013
	Volume	1.362	.006	1.037	233.516	.000
	Velocity	.403	.010	.172	38.731	.000
	Variety	2.341	.013	.232	56.345	.012
	Veracity	1.123	.002	1.234	32.124	.000
	Value	1.999	.234	2.345	1.223	.234

Table 11 Regression analysis

@ p = .013, .000, .000, .012, .000 and .234 all the values are less than .005 model is fit and significant to predict the effect of independent variable on dependent variable. With coefficients @ 1.362, .430, 2.341, 1.123 and 1.999 values of volume, velocity, variety, veracity and value, linear model of regression predicts the degree change in independent variable with coefficients will change the decision making efficiency. Linear model exhibits the values that imply research hypotheses are true and characteristics of Big Data Analytics affect the capacity of information driven decision making of corporations.

$$Dc\_mkg = \alpha + \beta\,(V1) + \beta\,(V2) + \beta\,(V3) + \beta\,(V4) + \beta\,(V5) + e$$

Decision making function is linear in nature, with a constant change unit of .111 in decision making capacity and efficiency. Change can be positive and negative subject to coefficient of volume, velocity, variety, veracity and value of Big Data Analytics. Level of transformation of decision system depends on control implementations of decisions. Simon (1977) established the argument that decisions are behavioral and intuitive. Decisions makers of manufacturing industry are managers trained for proactive cognition. Linear function of decision making model runs with both practical approach and knowledge based decisions. All three phases of Simon (1966): Intelligence, Design and Choice are knowledge driven activities and huge volume of data is required for understanding the problem and its settings, designing alternate solutions for the problem, and making choice of right decision at right time with resources enough to implement and control the decisions. Decisions not controlled well are as good as failure for corporations

CORRELATION ANALYSIS

A correlation coefficient is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. The variables may be two columns of a given data set of observations, often called a sample, or two components of a multivariate random variable with a known distribution. Linear function of decision making is directly related to characteristics of Big Data Analytics and significantly related to organization's performance in manufacturing and services sectors. Information gathered from digital sources or BDA is business intelligence and is based on high volume of data, high velocity, high variety, high veracity and high value. All the "5Vs" of Big Data are inter-related with each other and are in causal relation with decision making systems of organizations. Executives, Directors and Managers solely responsible for decision making that carries out operational and marketing activities use the nominal relationship of independent variables to control dependent variable.

Once decisions are designed and choice of problem solving solution is made, implementation decides the organizational performance directly influenced by the information driven decision making. Performance of employees depends on the managerial decisions to produce more output from individuals. Positive correlation in between performance of corporations of manufacturing industry and decision making is dependent on usage of Big Data analytics or information insights generated by business intelligence

Items	***Description***	***Information driven Decision Making***	***Organizational Performance***
Information driven Decision Making	Correlation Coefficient	1	.986**
	Sig. (2-tailed)		.000
	N	139	100
Organizational Performance	Correlation Coefficient	.986**	1
	Sig. (2-tailed)	.000	
	N	139	100

Table 12 Pearson Correlation of Decision Making and Organizational Performance

Table 11 exhibits the Pearson correlation between information driven based decision makings and organizational performance both the variables are positively correlated with each other at 0.986 with N = 139. Table 11 implies that there is a positive correlation with strong bonding. Positive usage and change in information driven decision making will increase performance of individual and organization efficiently for the manufacturing industry.

SUMMARY OF FINDINGS

All the null hypotheses are rejected and study hypotheses are accepted as exhibited in table 4 an table 5. T-values of volume, velocity, variety, veracity and value are greater than t-table value. There is a significant relationship between volume, velocity, variety, veracity and value and decision making of corporation. Skewness and Kurtosis exhibited in table 5 implies that data is normally distributed and rejection of null hypotheses in justified. Descriptive statistics of the study exhibited in table 6 implies that summary of mean ratings characteristics of Big Data Analytics influence information driven decision making of manufacturing industry of Republic of Uganda. Regression analysis and change statistic exhibit that model is fit for prediction and significantly different with *p*-values less .50. Function of decision making is linear, effects of "5Vs" on decision making is linear with constant. Scatter plot in figure 4 exhibits the values of data set from decision making and Big Data, implies ratings of data set are close to strongly agree to the hypotheses of the study. Study also gives the correlation of decision making and organizational performance of manufacturing industry.

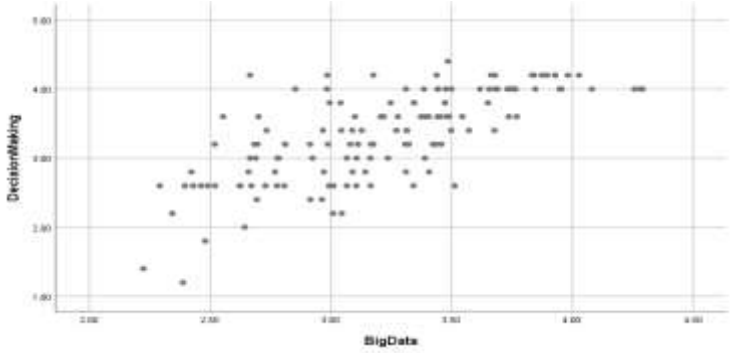

Figure 4 Scatter Plot for Linear Function of Decision Making

CONCLUSION

Study concludes, on the basis of statistical treatment of the data in IBM SPSS that Big Data Analytics is competing technology in digital business age best suited for huge volume of knowledge acquisition. Researchers argue the cost of Big Data Analytics implementation is higher opportunity cost. Decision makers (Executives, Directors, and Mangers) from manufacturing industry of Republic of Uganda are under immense pressure to make unavoidable decisions in critical conditions. Operational decisions, Strategic decisions, Research and Development decisions, market decision and downsizing decisions etc require background setting information of problems and opportunities.

High Volume of information with authentic source is a reliable asset with change of rate this digital analogy gives to these information characteristic of Big Data Analytics Volume, Velocity, Variety, Veracity and Values are positively interconnected with each other and decision making stages of Simon (1966): Intelligence, Design and Choice that decision makers follow in order to achieve efficient decision making process. Big Data Characteristics directly influence decision making function in linear model:

$$Dc\_mkg = \alpha + \beta\,(V1) + \beta\,(V2) + \beta\,(V3) + \beta\,(V4) + \beta\,(V5) + e$$

Study also finds and conclude causal relationship between decision making and organizations' performance in manufacturing industry which can also be generalize to services and financial sectors. Better decision making can bring positive change in performances of employees and corporation as whole to produce more output in efficient and befitting manner. Information driven decision making is process of long patience and stable though that bring innovative change in performances.

In this volatile environment of data driven disruption, business managers need to look through two lenses at the same time. Firstly, they have to identify high risk and rewarding opportunities such as entering new markets and changing existing business models. Secondly, they have to maintain their focus on including analytics into their core business decision making process. By embedding data analytics into their core strategy, business managers can streamline internal business processes, identify unfolding consumer trends, interpret and monitor emerging risks, and build mechanisms for constant feedback and improvement. Driving analytical transformations will thereby enable companies to gain competitive edge and stay at the forefront of digital disruption.

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