DOI: 10.21276/sjbms

Saudi Journal of Business and Management Studies **ISSN 2415-6663 (Print)**
Scholars Middle East Publishers **ISSN 2415-6671 (Online)**
Dubai, United Arab Emirates
Website: http://scholarsmepub.com/

Big Data Environment & Communication Management (A statistical analysis for large projects)

Suhail Memon[1], Wang Changfeng[1], Shahid Rasheed[3], Zulfiqar Hussain Pathan[1]; Muhammad Zahid Tunio[2]
[1]School of Economics and Management, Beijing University of Posts and Telecommunications, China
[2]School of Software Engineering Beijing University of Posts & Telecommunication, China
[3]Pakistan Telecommunication Company Limited (PTCL), Pakistan

***Corresponding Author:**
Suhail Memon
Email: suhail_sam06@yahoo.com

Abstract: Project communication can be defined as the exchange of information aiming to instill knowledge among the stakeholders, thus acting as a binding force which connects many stakeholders of the conceived project and its environment in addition to coupling its activities during the development and execution of the project. Project Communication Management is highly concerned with technology as growing ways of communication are rapidly increasing in the global business world. This research is about understanding the relationship of communication management with Big Data (BD). This research assesses the level of awareness of communication management professionals regarding BD technologies and analyzes the contribution of different factors responsible for the rate of adoption of BD technologies in order to manage communication in large projects.
Keywords: Communication Management, Big Data Environment, Large Projects

INTRODUCTION

Project communication is all about connecting different stakeholders for effective communications [1]. The stakeholders are part of any company which directly or indirectly affects their lives [2], which include regulatory bodies, users/customers, team members of the projects, or the people who have sponsored the projects. Many scholars like Baker [3] & Lester [4] have agreed to these definitions generally. This has been repeated by Baker, 2007 & Ramsing, 2009) [5]. Baker stressed that non-effective communication adds up to ninety five percent of majority of project failures. As per Lester [4], having an effective communication is the essential part of the success of any project. Similarly the quality of service is also one factor which involves proper project delivery and execution. In this respect the quality of communication is the essence which needs to be maintained at all costs [6]. As per Burt, the most effective project communications happens when (at the time of the process of encoding) sender attracts the receiver's attention [7]. Ray explains that these interests can be generated from different dimensions like previous experience, culture, faith/religion, and economics etc. PM (Project Communication) is seen to be orchestrated as extra PM ("external project" environment) & intra PM [8, 9].

For the last few years we have seen extraordinary development in the field of information technology. The emerging of Cognitive Networks, Big Data, Internet/Cyber Security and Green Communications has brought about a new technological revolution in this digital and virtual age. Almost every large enterprise has started adopting these innovative technologies for effective working. These technological developments have altered that way people used to work and provided them with a lot of convenience. To remain competitive in the business environment, large companies have readily adopted new technological ways for smart working. Communication is playing a vital role in the working of organizations which are technology dependent for their operational needs. The relationship between the stakeholders and the project success are greatly dependent on the communications setup and effectiveness [5]. There is a growing need of communication management inside the discipline of project management. "PMOBK" guide issued by Project Management Institute (PMI) has reserved a specific chapter on this growing knowledge area [10]. The Managing Successful Programs (MSP) guideline by "Office of Government Commerce" (OGC) has classified it as a function for projects &programs management [11].

Adoption of data management solutions in the organizations greatly affects communications. In addition to "information processing" the sources of data/information in order to complete the transactions& integration have become really

important for the projects [12]. In this communication landscape, electronic mediums& data management have acquired great significance. Project stakeholders (including employees & members) can exchange important information through the use of emails, data repositories and many other innovative communication technologies. BD has also described "communication management"by extracting of value from modern information/data sources i.e. public information, mobile phones, vehicles enabled sensors, and other technological advancements. A project gives lot of information to the stakeholders relating to suppliers, procurement, and logistic functions etc. hence communication & project performance exhibits a substantial correlation when we are looking at big projects involving communication systems [13]. Majority of the information in this technological intensive environment is exchanged through internet/web based programs or various enterprise solutions. Enterprise (corporate) communication is an example of using internet/web based resource programs for use in business communications& organizational communications [14].

Nowadays information is created as multipurpose as it can be utilized for more than a single functionality. Communication is art of collecting all concerned information, interpreting this information, and efficiently distributing the information to nodes that might need it. Communication has got significant importance to everyone involved in large projects [15]. Proper use of communication and exchange of information maintains stability within projects distributed units. Geographically scattered large projects have become essential practice within advanced organizations because of internationalization of enterprises. The fast growth of communication technologies has changed the style of collaboration. In this scenario BD technologies enable communication across globally spread large projects. Geographically dispersed projects mostly rely on communication media [16], therefore a big challenge for communication management is to establish a relationship between globally distributed project teams [17].

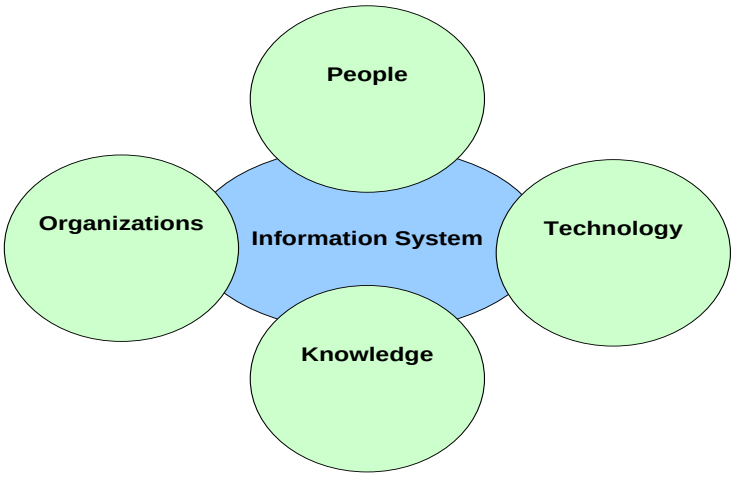

Fig-1: Multipurpose Information System

In large projects face-to-face interaction is not always profitable, therefore communication technology provides authenticate channels to interact in better ways [18]. The communication hindrances that international projects usually face lean to create missing informal communication, which remains an unremitting struggling reason for globally distributed teams [19]. The infrastructure of one organization that is conducting international projects should be installed with Computer Mediated Communication Systems (CMCS) [20]. These computers are used to exchange and process information, and use telecommunication networks for such exchanges [21]. CMCS include video conferencing, cloud computing, online sharing of information, electronic mails, and BDTechnologies. The advance technologies that enhance the communication capabilities and provide transition of data and information develop the team work between globally dispersed units of large project.

Research Contents and Key Technologies

Project communication is defined as the information exchanges intending to create an understanding between the project stakeholders. It acts as an integrating factor that connects various stakeholders (of the project) together & also the project to its environment. It also unites various activities relating to different levels of development. Project communication Management is highly concerned with technology as growing ways of communication are rapidly increasing in the global business world. This research is about understanding the relationship of communication management with Big Data.

Fig-2: Generic framework for BD Communications

BD technologies are concerned with handling the large data sets of large projects containing a variety of data to explore concealed patterns, unidentified correlations, market trends, customer preferences, and precious organizational information sets. According to the literature of Social Sciences BDis concerned about differentiation of performance in organizations [22], Barton and Court describe BDas an element of competitive advantage for organizations [23]. The growing flexibility of linking asset information with multidimensional attributes of other data is continually being realized by owners of enterprises [24]. Today organizations need technology investments in communication sectors to derive impactful outcomes, flexible solutions, modern IT services, nimble response, and more capable domain control of strategic assets. BD integrates technologies to extract a platform to build suitable solutions. Such technologies are being integrated in project based industries to create more agile methods of organizing the communication [25].

In BD we do not see the hardware infrastructure but the user interaction with the applications. Due to the use of internet as communication channel or connecting factor between applications, BD technologies can access any information any time worldwide. With availability of internet connections organizations can communicate globally when conducting large projects. There has been enormous growth in BD technologies in small and medium enterprises as compared to larger organizations. The most frequent factors faced by the large organizations have been the untrained IT/communication workforce and controversial views towards BDtechnology usage.

Introduction to Big Data

BD nowadays has become very important technology for this digital age/world. BDhas the technology trends for organizations which rely on information from the improvement of customer experience and business models. BDis an integration of data management and technological development over a period of time. To get right awareness, data is stored, managed and manipulated at actual time and actual speed in the organizations [26]. Understanding BDincludes how data is being managed so that organizations can provide and design solutions to support requirements of business.The journey of BDis at an early stage in most companies [27]. Collecting large amount of data experimenting techniques are used by companies to find out hidden patterns present in data. Companies have begun to analyze different solutions for BDas new opportunities are unfolding. Companies are monitoring data that is coming from machine sensors and how processors are being modified. For the customer products, retailers will possibly monitor data in real time so they can execute data for financial gains. Solutions provided by BDare also being used in healthcare to find about the illnesses and to provide proper guidance for various treatment options [28].

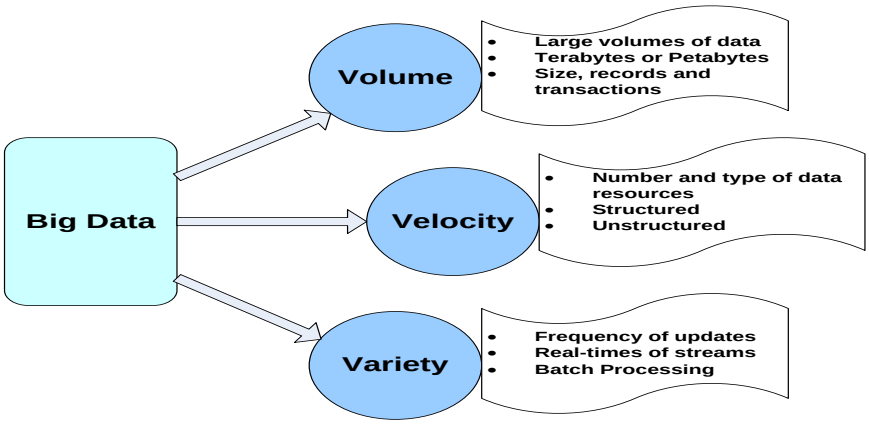

Fig-3: Three V's of Big Data

Big data (BD) is not about isolated solutions but the implementation of BD which includes scalability, distribution & management in places that require solutions [29]. So for making the use of this important technology trend we have to put together technical and business strategy.There are many reasons why BD technology is better and important and how companies are using these technologies and new database in daily routine. Great benefitsand challenges have always been there in managing and analyzing data for all sizes of organizations business and industries [30]. Data helps us to get a pragmatic approach in business to capture information about the customer products and services. Things were straight and simple when a company had few customers and they used to buy same product in a same manner. But with the passage of time companies have become more complex and are offering diversified products to gain competitive advantage with customer. When we talk about data there is large number of complexity [31]. Structured data is stored in traditional relational database however unstructured data includes videos pictures, documents and customer service records. Humans are generating new information sources for example website generate stream of data with just a click and data gathered from social media is mind blowing [32].

Evolution of Data Management

New revolution in data management gives us a new start and it would be nice to think that it is not connected to our past. New stages of data management whether its innovative or incremental are made on their antecedent. A software lens is used to view data management but actually a holistic perspective should be used to view it [26]. For virtualization and cloud computing, data management includes computing model, hardware, networking and storage [33]. We can avail new opportunities and data landscape by new emerging technologies and low cost from storage to compute cycles.

BD provides companies to store heavy amount of information/data and analyze it to get right awareness at actual time [34]. BDis the evolution of technology which includes last 50 years of hard work. Now a day's data management is on top in organizations [35]. We are moving to latest era where technologies are designed according to the business requirement monitoring number of customers and sold products in appropriate time with integrated data available from all the sources in organization [36]. We can say data is like a gold mine but when we talk about the amount of gold in gold mine there is very small amount of gold and large amount of other different things in it.

Defining BD

BDis a combination of old & new technologies which helps the company to get successful results. BDincludes managing large amount of data at great speed (real time) frame for analysis and reaction [37]. Understanding the work at hand is critical. Verification of data depends on both context and accuracy. Analyzing large amount of data in real time to access the worth of the customer & by these results business provide additional special offers to their customers[38]. Business results can be depicted by the amount of data used-data types. All data is integrated which includes structured and unstructured data from data streams, email, text and social media. Companies deal with data all the time in different forms. When we know what we have to do with information this brings change to big data. If the technology is in place, BDcan be used for solving problems and the opportunities can be unlimited [39]. BDbrings lot of change with the help of data patterns and can provide better product quality.

Architecture Management

For meeting the requirements of project needs and to implement it in future organizations an underlying architecture is designed [40]. It begins by capturing, then organizing, then integrating, then analyzing, and finally acting on it. When we consider the architecture of BDwe should first be familiar with the functional concerns. Firstly the data is captured, organized and then integrated. After this data is implemented successfully and then analyzed. Actions take place according to the results of analysis. The model is shown below [41].

It is essential to support functionalities and performances. Analysis depends upon the need of the customer you are supporting. Computational power and fast speed is needed for the analysis of data [42].Performance is done in real time for some analysis, and some amount of data needs to be stored. Architecture must have the correct amount of redundancy so that unanticipated latency can be avoided.For understanding BDcomponents, the architecture plays an important role. Many services are included in BDmanagement that helps companies to make an effective and efficient use of data. This below diagram will help you understand the showing the relationship between the components.

Redundant Physical Infrastructure

In BDstructural design, the support of physical infrastructure is the most important point for its operation. In fact, BDwould not have appeared as a pertinent trend without the support of strong physical infrastructures. The physical infrastructure for BD needs to be different from that of the traditional data in order to support unexpected and unpredictable data volume [43]. A distributed computing model provides base to the physical

infrastructure. It means that by using different data analytical tools and applications, data can be linked together through networks which is then stored at different locations. It's essential to consider redundancy of the data when we deal with large amount of data from different sources. To sustain IT growth and to enhance internal resources, company must use external cloud services. In some cases, Software-as-a-Service [44] helps companies to achieve data analysis as service. It offersless cost, quick setup and error free development of the base ground technology [45].

The Security

More the data becomes critical to the company the more they are concerned about its security. For instance running a health care company you need large data applications to analyze demographical changes or changes in patient requirements, hence such data needs protection in order to follow requirements and basic patient's privacy [46]. Then you need to determine to whom you want to allow to see that data and under what conditions. User's identification should be verified while patients' identification should be secure. Above security measures need to be performed from the outset.

Types of BD

Variety is core ingredient of BD. For getting maximum benefits, information should be merged in a way for proper detailing and data management. It's harder than its sounds. So to make it less hard we have two main types of data:

- Structured Data
- Unstructured Data

We all know data management is not new in the world, however two factors are not so well known, which are;

- Gadgets like cell phone, sensor generate different kind of data that is new source of BD.
- In the absence of technologies (because of scarce resources) data collected for certain purpose is not being taken care of for further analysis.

Data which is well defined in a detailed manner is called the structured data. It includes details like client's name, address, and landline or cellphone number. Hence all dates, numbers and words are included in structured data. The data you are dealing with in a database is generally in a structured format. If you have to find or have any question related to it, you use structured query language like SQL. This data may include operational planning of the enterprise resources and relationship management of the customers [47]. For further examination, these types of data are merged in a data warehouse.

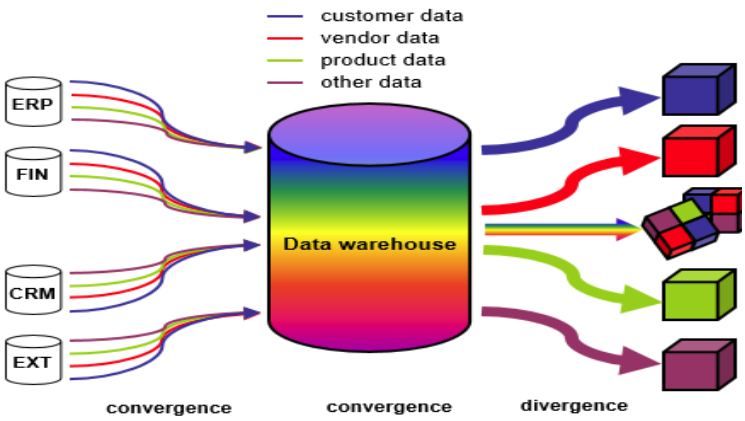

Fig-4: Data Warehouse Structure

Theoretical Framework

As per our analysis of the literature review, we see that established communication model has different components integrated together [48]. This includes the all-important functions of Sales, finance, Human Resource Management, Procurement & CRM. The data coming out of this (meta data) needs to be saved & analyzed. The data is available in the form of unstructured format which needs cleansing and data mining to get useful output from it. The Information Inference Framework (IIF) provides that space for computing and analyzing the data for effective working of the company and for easy decision making based on the user friendly graphical data interpretations.

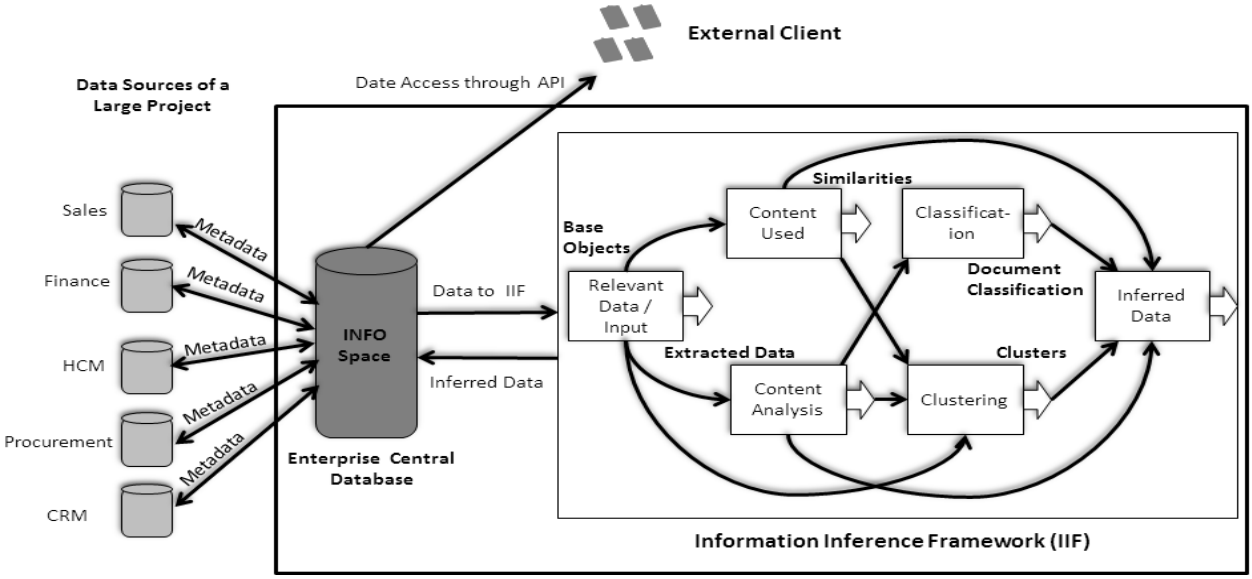

Fig-5: Model of Communication Management of Large Projects in Big Data Environment using IIF

Based on this model, we have come up with independent and dependent variables which can ensure effective execution of these large projects in intensive data availability and processing environment.

Independent Variables

As per the literature review, the research work has identified the following 5 functions (for LSPBDE) as IV's:

- Allocation of LSPBDE to the competent person having technological background.
- Distribution of rational quantitative workload to the project member/teams using BDwarehousing and analysis tools.
- Setting rational timelines for project completion based on processing of the information through integrates management information systems/enterprise solutions.
- Establishing stakeholder's communication plan using advanced communication mechanisms.
- Monitoring performance through integrated performance management systems.

The study focuses on the above mentioned 5 independent variables because these 5 variables (functions) encompass many functions of large scale projects management in the BDenvironment. Secondly, they have to be adopted for execution during the PM for large scale project.

Dependent Variables

My research workevaluated project outcome or result having 2 dimensions i.e. successful being denoted as "D 1" and/or the suffering one by "D 2" withcombination of the following 4 elements in case of LSPBDE.

- Project staying within budget
- Project staying within allocated time
- Substantial/Great organizational benefits
- User's satisfaction

The five independent variables have a direct bearing on the following projects results/outcomes (Dependent Variables) in the BDprojects with extensive information at hand to be analyzed.

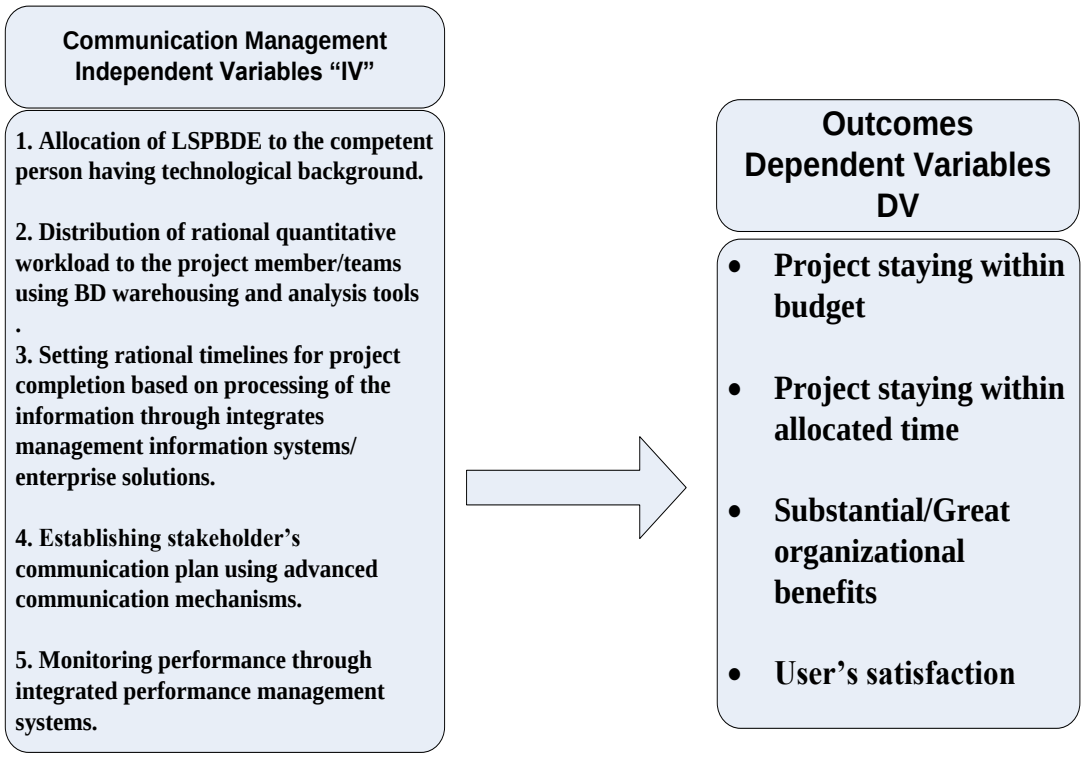

Fig-6: Independent & Dependent Variables

Hypothesis

On the basis of the developed theoretical framework (given above), the study hypothesized that LSPBDE are function of "quality of human analytical practices" of selected elements of human functions (collectively), i.e. all other technical/knowledge areas have been taken care of properly. This research work came up with hypothesis that the quality of practice (each selected element) of Information technology/Technology/Human resource management (HRM) was correlated to the project result. However before we present the hypothesis, we have to develop a conventional framework of adoption of BDfor communication management.

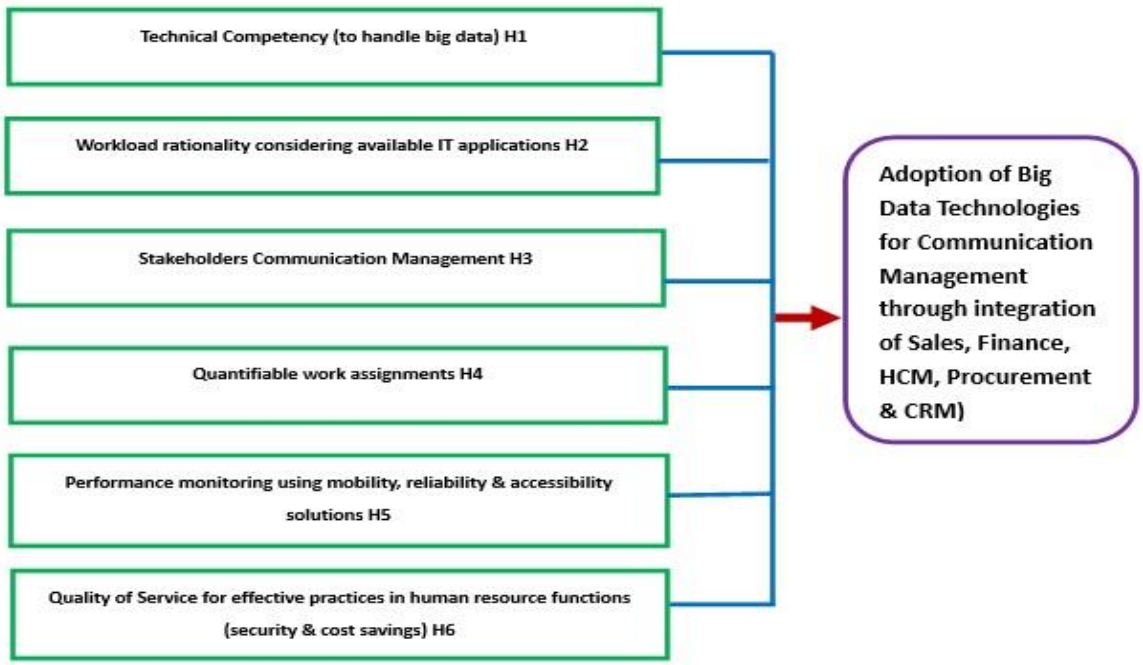

Fig-7: Hypothesis with Adoption of Big Data.

The research work depicts hypotheses as;

H1. Greater (assigning tasks practice) forcompetent technical person (technical competency to handle BD), best will be chances forsuccess of the Project (PS).

H2. Quantitative work load oftheteam members (TL) are assigned more realistically with rationality (using IT applications) the chances that the project will be successful will be more.

H3. Effective Stakeholder Communication Management (SC), better will be the chances for the success of the Project (PS).

H4. Rational (quantifiable) quantitative workloads (QL) for individual team members, greater are the chances forsuccess of the Project (PS).

H5. Effective performance monitoring (PM), through the use of mobility, reliability & accessibility solutions, the chances for the success of the Project (PS) will be more.

H6. Great Quality of Service for effective practices (security/cost savings) in human resource functions; greater will be the prospects of the success of the Project (PS)

In short, hypotheses in this research work stems from the literature review that suggests that the substandard human and operational Practices in LSPBDE may lead towards inefficiencies while great standard practices will certainly lead to the success of the projects.

The study is co-relational carried out in the discipline of LSPBDE. It targets studying and analyzing the performance of the large project in the BDenvironment. Management staffcarrying out selected functions for large BDprojects in the selected Telecommunicationsetups managing large scale projects (heterogeneous) were studied and analyzed. It should be noted here that the BDgeneration is mostly relating to the telecom companies which gather inside and outside information in trillions of bytes and then processes it at its data ware houses through data mining and BDanalytical tools.

Researchers Involvement

It was strictly observed that the data input from the respondents should remain unbiased, hence the respondents were given freedom to express themselves without interfering in their thought process or influencing them with researchers own views. However if the respondents faced any issue relating to understanding of the questions or about the filling of the forms, a non-intrusive intervention was done as a guiding aid.

Sample Population

The sample population comprises of groups of at least 4 large projects (BD intensive) professionals or more, undertaking considerable large projects (BD intensive) of varied nature & scope.The analysis was based on 7 factors which will be studied in detail in the proceeding paragraphs. Latest projects were selected.It was done to ensure that the research carried out is upto the standard based on the latest available data and project trends.

- Large BD intensive Projects (heterogeneous).
- Duration of Project: More than a month (completed before Jun 2016).
- Team Size: Equal or more than 4.
- Properly documented (Information technology projects)
- Willingness of the organization for the provisioning of the desired data.
- Availability of a minimum of 4 members at the time when data was collected.
- The effect on the quality of the project is dependent on the quality of Human Resource Staff.

DATA ANALYSIS RESULTS AND DISCUSSIONS

In this section we look at data analysis of a sample of 70 heterogeneous IT projects. The variables of the study will be looked into. This will be followed by the relevant statistics and hypothesis testing leading towards the final results and the subsequent discussion. This section will elaborate the impact of independent variables on the dependent variable by using SPSS. We will see the results and analysis the difference between practices of communication management by putting the responses in the required manner. This analysis will result in summarizing the conclusion that what kind of practices should be implemented when companies are going to use Big Data environment for their performance improvement. Mainly we will analyze the significance level of the variables and the nature of relationship and variance between variable for successful outcomes. The following table elaborate the detail of independent variables in accordance of analysis.

Table-1: Independent Variables

Right Person Independent Variable (IV-1)	Allocation of LSPDE to competent technological person having background
Time Lines Independent Variable (IV-2)	Setting timelines for rational project completion based on processing of information through integrate management information system enterprise solution.
Stakeholder Communication Independent Variable (IV-3)	Establishing stakeholder communication plan using advanced communication mechanism.
Work Load Independent Variable (IV-4)	Distribution of rational quantitative workload to the members using Big Data Warehousing and analysis tool
Performance Monitoring Independent Variable (IV-5)	Monitoring performance through performance integration management systems.
Project Result Dependent Variable (DV)	Depicts the dependent variable (result or outcome of the project).

The research work comes out with the following facts:

H1 = Technical Competency (to handle big data)

To handle the big data, the technical competency was found to be quiet correlated with the final project results. Table 6, indicates that the Pearson Coefficient having a value of (β).184 with P < 0.0. As per the research the hypothesis H1 relating to the technical competency for the handling of the big data for the successful completion of the project. It is found that the both the variables are correlated, hence the interpretation that the project success is dependent on the staff having the right technical competency.

H2 = Workload rationality considering available IT applications

When we look at the project results, setting the timelines or the deadlines is very much associated with the success of the project. Table 6, indicates thatthe Pearson's correlation coefficient (β) 0.486 and *P* value< 0.00 , considering the workload rationalities in mind and the use of IT applications by the team members, the workload distribution exhibits an impact on the success of the project. As the Pearson correlation is positively placed, hence it shows that the project result has a dependence on "Workload rationality" (for available IT applications). Hence the study support

H3 = Stakeholders Communication Management

Stakeholder Communication & Project Results show a very good level of correlation with Pearson value being (β) 0.22&*P* having a value < 0.00. As per H3 better we have the Stakeholder communication, greater will be the chances of project success. Table 6, indicates thatthe Pearson correlation being high, it is evident that the project results greatly depend on good quality of stakeholder communication. Hypothesis H3 which relates to Stakeholders Communication Management is hence substantiated.

H4 = Quantifiable work assignments

Quantifiable work assignments & the Project Results are greatly correlated with Pearson value being (β) 0.120 and with P < 0.0 (please see table 6). Hypothesis H4 i.e. quantifiable work assignments given to each team member, has a great impact on the project success. Higher Pearson correlation value shows that project really depends on the rational sharing of the quantitative workload among employees. Hence hypothesis H4 is accepted.

H5 = Performance monitoring using mobility, reliability & accessibility solutions

Similarly, the Performance monitoring (using mobility, reliability & accessibility solutions) show strong correlation with Pearson Correlation having the value of (β) 0.04& P being < 0.0. H5 (Performance monitoring using mobility, reliability & accessibility solutions) explains that greater the regularity & quality in the monitoring of the performance (PM), see table 6, greater are chances for Project Success (PS). High correlation depicts that project results greatly depend on performance monitoring. Therefore the study proves hypothesis is H5.

Table-2: Descriptive Statistics[a]

	Mean	Std. Deviation	N
Project Results (DV)	3.6666	.85444	70
Right Person (IV-1)	3.26	1.149	70
Time Lines (IV-2)	3.9326	.79284	70
Stockholder Communication (IV-3)	3.2657	1.01742	70
Workload (IV-4)	3.6142	.99966	70
Performance Monitoring (IV-5)	3.4454	.84296	70

Table-3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
	Project Type < Hybrid (Selected)				R Square Change	F Change
1	.814[a]	.662	.634	.51724	.662	23.129

Table-4. Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	5[a]	59	.000

a. b. Predictors: (Constant), Performance Monitoring (IV5), Time Lines (IV2), Stockholder Communication (IV3), Workload (IV4), Right Person (IV1)

Table-5. ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	30.940	5	6.188	23.129	.000[c]	
	Residual	15.785	59	.268			
	Total	46.724	64				

Table-6. Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.111	.367		3.024	.004
	Right Person (IV1)	.184	.099	.248	1.859	.008
	Time Lines (IV2)	.120	.100	.044	.469	.000
	Stockholder Communication (IV3)	.220	.075	.036	.399	.009
	Workload (IV4)	.486	.113	.569	4.294	.000
	Performance Monitoring (IV5)	.043	.108	.032	.298	.000

As a result of our above analysis, it is seen that the result of LSPBDE depends on the "quantitative workload", by managing the stakeholder communications effectively & then monitoring the performance of the team members. Success or failure of LSPBDE are infect coupled with selecting the right relevant technical individual for various project activities and then setting realistic timelines for them for the entire project life time. Hence hypothesis H6 (Quality of Service for effective practices in HR functions i.e. security & cost savings) is also practical and depicts that improving the quality of practice of all disciplines, will increase the chances for project's success. Hence, before we substantiate hypothesis H6, research work found that it is more practical to test it by using the regression method. We can further deduct that the independent variables are positively correlated with different magnitudes of correlations.

Additionally, table showed the value of R^2 for this model relationship between independent and dependent variables. The R^2 value for this model relationship is 0.662, *f* value 23.129 $p < 000$which means 66.2% change in adoption of big data due to its determinants i.e., right person, time lines, stock communications, work load and performance monitoring. All hypotheses are supported by results.

Similarly, the Right Person (IV-1) is only slightly correlated with the Time Lines (IV-2), Stake Holder Communication (IV-3) and Performance Monitoring (IV-5) having Pearson Correlation of less than 0.4 &*P* being 0.0 and are not correlated to Work Load, IV-4 with Pearson Correlation less than or equals to 0.4 at $P = 0.0$. The independent variables show slight correlation with each other having Pearson Correlation greater than or equals to 0.4 with P being 0.000 with the exception that of Right IV-1 with IV-4. This shows that the IV's are a bit correlated with each other. It also indicates that if right person is selected, timelines, stakeholder communication and performance monitoring are in turn automatically going to be for the betterment of the project. The correlations between the overall 5 functions support the model of this research work which will also be tested using the regression analysis. It should be noted that IV-4 does not show correlation with IV-1 but it is substantially related to all the other independent variables.

If we look at the slight correlations among the IV & DV of this research work, it indicates the fact that

the designed model (theoretical framework) made/designed with the help of logically related IV's is effective. These findings are essentially based on the hypothesized model of this research work hence making it eligible to be tested (regression analysis) for further confirmation that the impact of "management functions" on project's results exists. Furthermore, none of the 2 IV's is correlated hence indicating that that the Co-linearity among the IV's is quite acceptable.

Based on the above hypothetical analysis current study propose the following model for adoption of Big Data in the communication practices in large projects, Big Data certainly need improved technological persons with specific features and characteristics that can meet the needs of large projects. The growing environment of connectivity between various organizations and platforms demand the maximum workload quantifying capability to enhance the project performance. The approach of fulfilling the task within timelines needs to enhance the velocity and frequency of transactions while conducting large projects. Therefore Big Data is appropriate domain to integrate in communication management. Beside these facts in the environment Big Data projects need extra capabilities for monitoring the performance and development.

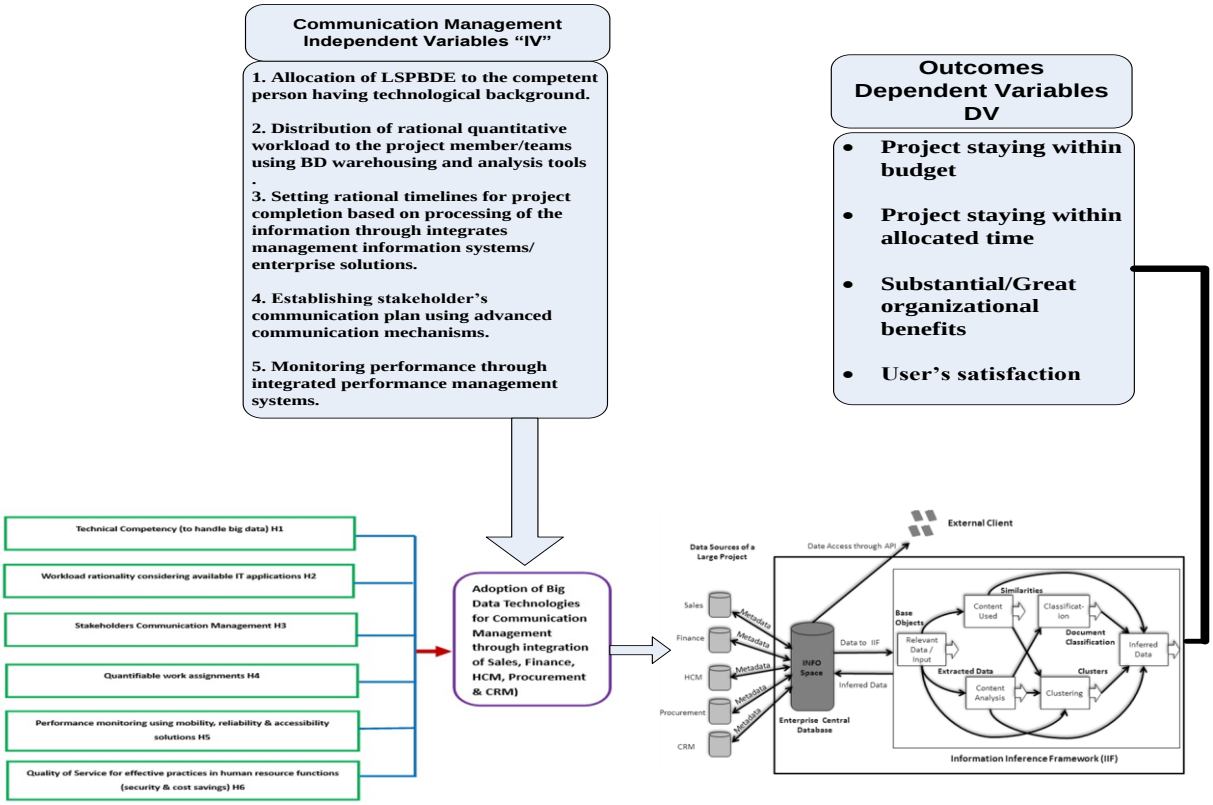

Fig-8: Designed Model for Adoption of Big Data in Communication Management

CONCLUSIONS

In this paper a new model is designed for managing the large scale projects using the novel environment of Big Data. Big Data are usually generated in variety of organizational projects database, software, ERP, and many others. Therefore, there is a severe gap for building platforms to handle big range of activities through heterogeneous event processing systems. The designed model depicts the research identified these 5 functions as 'The Framework of 5 Independent Variables' to take care of large projects needed for ensuring effective success for BDenvironment projects. 'The Framework of 5 Independent Variables' is designed to making the BDprojects management structuredand error free for project execution by the project managers. Finally the project manager only has to utilize these 5 Independent Variables together in an effective manner in communication management.This research focused only on LDPBDE however it is said with certainty that the suggested 'The Framework of 5 Independent Variables' can be applied in the management of any BDtechnical project because it has been analyzed by the study of heterogeneous projects, hence the contribution of this research work is applicable to all sorts of general projects.Another importantadvantage of this 'Framework of 5 Independent Variables' for management of LSPBDEis that it requires no additional burden for the project managers. The reason behind this is that the 'Framework of 5 Independent Variables'

directs project managers to perform only the important/essential/effective practices while doingBDmanagement thus ensuring success of the projects.

REFERENCES

1. Ruuska, K. (1996). Project Communication.". In *Proceedings of the IPMA 96 World Congress on Project Management, Paris, France* (pp. 67-76).
2. Freeman, R. E. (1999). Divergent stakeholder theory. *Academy of management review*, *24*(2), 233-236.
3. Baker, B. (2007). Power points. *Project Management Network*, *21*(3).
4. Lester, A. (2006). *Project management, planning and control: managing engineering, construction and manufacturing projects to PMI, APM and BSI standards*. Butterworth-Heinemann.
5. Ramsing, L. (2009). Project communication in a strategic internal perspective. *Corporate Communications: An International Journal*, *14*(3), 345-357.
6. Lievens, A., Moenaert, R. K., &Jegers, R. S. (1999). Linking communication to innovation success in the financial services industry: a case study analysis. *International Journal of Service Industry Management*, *10*(1), 23-48.
7. Lin, N., Cook, K. S., & Burt, R. S. (Eds.). (2001). *Social capital: Theory and research*. Transaction Publishers.
8. Ray, C. (2006). Neo-endogenous rural development in the EU. *Handbook of rural studies*, 278-291.
9. Lievens, A., &Moenaert, R. K. (2000). Communication flows during financial service innovation. *European Journal of Marketing*, *34*(9/10), 1078-1110.
10. Fowler, J. H., Dawes, C. T., & Christakis, N. A. (2009). Model of genetic variation in human social networks. *Proceedings of the National Academy of Sciences*, *106*(6), 1720-1724.
11. Boddy, D. (2001). *Managing projects: building and leading the team*. Pearson Education.
12. Scott, S. (2007). Corporate social responsibility and the fetter of profitability.*Social Responsibility Journal*, *3*(4), 31-39.
13. Granovetter, M. S. (1973). The strength of weak ties. *American journal of sociology*, *78*(6), 1360-1380.
14. PMI, A. (2008). guide to the project management body of knowledge Project Management Institute. *Newton Square, PA*.
15. Emmitt, S. (2010). *Managing interdisciplinary projects: a primer for architecture, engineering and construction*. Routledge.
16. Stawnicza, O., &Kurbel, K. (2012). How to Prevent before You Must Cure–A Comprehensive Literature Review on Conflict Management Strategies in Global Project Teams. *Orlando, Florida*.
17. Herbsleb, J. D., &Mockus, A. (2003). An empirical study of speed and communication in globally distributed software development. *IEEE Transactions on software engineering*, *29*(6), 481-494.
18. Paasivaara, M., afOrnäs, N. H., Hynninen, P., Lassenius, C., Niinimaki, T., &Piri, A. (2010). Practical guide to managing distributed software development projects. *Aalto University, School of Science and Technology, Espoo*.
19. Bruegge, B., Dutoit, A. H., & Wolf, T. (2006, October). Sysiphus: Enabling informal collaboration in global software development. In *Global Software Engineering, 2006. ICGSE'06. International Conference on* (pp. 139-148). IEEE.
20. Lee, C. E. (2010). Face-to-face versus computer-mediated communication: Exploring employees' preference of effective employee communication channel. *International journal for the advancement of science & arts*, *1*(2), 38-48.
21. Rice, R. E. (1987). Computer-mediated communication and organizational innovation. *Journal of communication*, *37*(4), 65-94.
22. LaValle, S., Lesser, E., Shockley, R., Hopkins, M. S., &Kruschwitz, N. (2011). Big data, analytics and the path from insights to value. *MIT sloan management review*, *52*(2), 21.
23. Barton, D., & Court, D. (2012). Making advanced analytics work for you.*Harvard business review*, *90*(10), 78-83.
24. Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS quarterly*, *36*(4), 1165-1188.
25. Levitt, R. E. (2011). Towards project management 2.0. *Engineering Project Organization Journal*, *1*(3), 197-210.
26. Hilbert, M., &López, P. (2011). The world's technological capacity to store, communicate, and compute information. *science*, *332*(6025), 60-65.
27. Boyd, D., & Crawford, K. (2011, September). Six provocations for big data. In *A decade in internet time: Symposium on the dynamics of the internet and society* (Vol. 21). Oxford: Oxford Internet Institute.
28. Power, D. J. (2014). Using 'Big Data'for analytics and decision support.*Journal of Decision Systems*, *23*(2), 222-228.
29. Campbell, P. (2008). Editorial on special issue on big data: Community cleverness required. *Nature*, *455*(7209), 1.
30. Reichman, O. J., Jones, M. B., &Schildhauer, M. P. (2011). Challenges and opportunities of open data in ecology. *Science*, *331*(6018), 703-705.

31. Hellerstein, J. (2008). Parallel programming in the age of big data. *Gigaom Blog*.
32. Segaran, T., &Hammerbacher, J. (2009). *Beautiful data: the stories behind elegant data solutions*. " O'Reilly Media, Inc.".
33. Kumar, P., & Pandey, K. (2013). Big data and distributed data mining: an example of future networks. *International Journal*, *2*, 36-39.
34. Acosta, J. G. (2015). LinkAnálisis de datos e Internet de las cosasenempresas de hidrocarburos.
35. Jacobs, A. (2009). The pathologies of big data. ACMQueue.
36. Tinkhede, S. A., & Deshpande, S. P. (2015). Big Data–The Vast Growing Technology with its Challenges and Solutions,". *International Journal of Computer Science and Mobile Applications*, *3*(1), 33-38.
37. Fan, W., &Bifet, A. (2013). Mining big data: current status, and forecast to the future. *ACM sIGKDD Explorations Newsletter*, *14*(2), 1-5.
38. Lohr, S. (2013). The origins of 'Big Data': An etymological detective story.*New York Times*, *1*.
39. Snijders, C., Matzat, U., &Reips, U. D. (2012). " Big Data": big gaps of knowledge in the field of internet science. *International Journal of Internet Science*, *7*(1), 1-5.
40. Hey, J. (2004). The data, information, knowledge, wisdom chain: the metaphorical link. *Intergovernmental Oceanographic Commission*, *26*.
41. Hashem, I. A. T., Yaqoob, I., Anuar, N. B., Mokhtar, S., Gani, A., & Khan, S. U. (2015). The rise of "big data" on cloud computing: Review and open research issues. *Information Systems*, *47*, 98-115.
42. Kitchin, R. (2014). The real-time city? Big data and smart urbanism.*GeoJournal*, *79*(1), 1-14.
43. De Mauro, A., Greco, M., &Grimaldi, M. (2016). A formal definition of Big Data based on its essential features. *Library Review*, *65*(3), 122-135.
44. Martin-Sanchez, F., &Verspoor, K. (2014). Big data in medicine is driving big changes. *Yearb Med Inform*, *9*(1), 14-20.
45. Grimes, S. (2013). Big Data: Avoid 'WannaV'Confusion. *InformationWeek. com*.
46. Hilbert, M. (2016). Big data for development: A review of promises and challenges. *Development Policy Review*, *34*(1), 135-174.
47. Wu, D., Liu, X., Hebert, S., Gentzsch, W., &Terpenny, J. (2015, August). Performance Evaluation of Cloud-Based High Performance Computing for Finite Element Analysis. In *ASME 2015 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference* (pp. V01AT02A043-V01AT02A043). American Society of Mechanical Engineers.
48. Memon, S., Changfeng, W., Rasheed, S., Pathan, Z. H., &Yanping, L. (2015). Communication Management of Large Projects in Big Data Environment. *International Journal of Hybrid Information Technology*, *8*(11), 397-404.