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Impact of GIS on Performance of Cellular Companies in Pakistan

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Abstract: The aim of this research study is to determine the impact of GIS on cellular companies in Pakistan. The research has a profound background containing the performance and IT levels in the companies. An efficient exploitation of IT has become decisive in improving inclusive operations. This research study is based upon the concept of a service-product bundle consisted of three elements: IT applications, dedicated IT departmental study and explicit study of companies globalization level. Thorough Quadrant Analysis data was analyzed to determine the impact of Global information system of companies with its impact ratio. Results based on the analysis illustrate the significance of GIS in the cellular companies with the IT applications.

Keywords: GIS, Cellular companies, Information Technology, IT application level, IT effectiveness, globalization, explicit services.

INTRODUCTION

“The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.”

Bill Gates reminds us that a successful organization requires more than mere IT implementation in an organization. Given the current state of the organizations of the developing world in 2007, which has witnessed the increase of competition from the organizations of the developed world, tens of thousands of layoffs and the demise of many start-ups, Bill Gates’ quote seem particularly relevant. After all, couldn’t we argue that many technology companies started out with good ideas and have been working hard? Perhaps they were working hard, but not necessarily working smart. Or maybe there were too many players competing for the same pie.

All of these observations have some truth. Early in the development of an industry, more concentration on operations may be required. While for mature industries, more concentration on the proper implementation of IT and trained human resources may be required. Regardless, successful business practice is about positioning a company well to beat the odds and executing relentlessly to capitalize on the position. To

create competitive advantage, business decision makers need to understand the importance of the proper implementation of IT and Global Information Systems. In today’s dynamic and ever-changing world, Information Systems and their proper implementation have become the sole source of competitive advantage. The past decade has witnessed unprecedented advances across a variety of technological frontiers. The pace of change is compounded by the convergence of some of these frontiers. Many promises have been made about the value creation potential of some of these developments, only to fizzle out later on. Early in 1980s we saw the materialization of executive information systems to support executive decision making. These systems provided executives with the essential information in a timely manner to support their decision-making. GIS is the key to companies’ performance regarding the support services. The use of these systems have improved over the years and now have become a “must have” for major firms whether these are in the third world countries or elsewhere. In these times it is significant that information is obtainable by these systems. It includes data from the worldwide operations of a global firm and its peripheral sources to assist these operations. It is necessary for companies to review the probable competitive pressure they might face due to other companies. This creates a requirement for a system that

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provides information to all employees including executives from all-inclusive operations. We can call such a system as Global Information System (GIS) and identify it as:

- An information system which is based on a computer;
- It gives easy access to all employees;
- It contains information from international sources; and
- It is a system for employees at all levels.

In this research paper, we have put forward a question; what are the factors which basically influence the IT effectiveness of the cellular companies of Pakistan with reference to their performance? More explicitly we have used a few variables i.e. IT application level, IT performance, A dedicated IT department in the cellular companies and the IT effectiveness.

Literature Review: As this decade progresses, it is becoming increasingly clear that economic conditions dictate the involvement of all fields in improving quality. Among other fields, Information Technology has proven itself to be one of the most important drivers of competitive advantage. Due to Information Technology, we have crossed the traditional barriers of institutions, geography, language and culture. In Pakistan, however the proper adoption of this new technology has comparatively a slower pace.

Information technology is becoming more and more reasonable, influential and reachable. Pragmatic confirmation shows that the use of information technology to broadcast, a mass, and process information in the firm increases in importance; over time. Although most managers initially believe that IT is important in running their businesses, their belief is not always reflected in their performance.

Global approach as a trendy Impression has freshly emerged in the conglomerate firms. Strategy does not require the approach of one trick but that of a kind which are many^[5].

In the system expansion the user participation has the major key role in the entire progression. Both the user involvement and user participation are having a long term affiliation with the globally use of system in the epoch.

It is important for managers to understand the full impact of their company's technological climate. As individuals, they are subject to its influence. As leaders they can sustain or change it. An organization's technological climate not only powerfully affects managers' sensitivity to their work but also

organization's capability to offer superior products and services than the competition.

In the Global information system (GIS), vigilantly crafted deal performs a break provider to the firms in order to boost synchronization and increase control. But this can also offer organization plentiful challenges at the same time as going globally.

Modernism in information technology in the developed nations is well conventional and these nations are creating speeding up in the IT inside the edge and out side. The entire development requests additional effectiveness.

Prospective users in the firms have a diversity of information systems. The services provided by the money-making enterprises. In numerous cases private computers are used to access these systems. So the whole process has dexterity significance in the firms^[31].

Effectiveness of the system is the foremost concern in the firm to execute the developmental progression. User satisfaction and utility investigation are the factors involved in the concern to generate a straight side^[34]. Operators which have a set-up of activities in diverse countries and cities have a break of system to take advantage from the synchronization of subsidiaries which are isolated^[23].

The Global Information System (GIS) has a global-coverage. IT practice is all the time becoming a cause of continual competitiveness and a chance for development. In detail, solution drivers for IT variation have included mounting interactivity in the global world.

Raymond^[32] stated that the size of the firm and other different factors of exploit of computer expend more the maturity of the firm concerning to the entire experience of the information system

Information system use and performance of the firm have a relationship which can be seen in the sales and overall performance of the firm. Performance which can be taken as the measurement of the development in the progress of the firm^[25].

In position for companies to make sure accomplishment of their goals and objectives routine measures are used to assess, manage and get better manufacturing processes. Performance measures are also used to compare the performance of different organizations, plants, departments, teams and individuals, and to assess employees.

In telecommunications mainly, the instantaneous impact was a noteworthy and a quick rise in the rate of spreading out and the transformation of predetermined networks.

Many organizations developed the computer based information systems which are accommodating to advance organizational effectiveness and efficiency. The

system execution is a progression in which numerous networking and computer factors are concerned^[26].

In 1994 Kelly has the proposal that a lot of firms have the Information technology applications and paying more and more for that but the part of effectiveness in the augmentation at the date is supplementary and more according to the playing part.

All data managed in a corporate sector firm is if unified results the positive activity in the performance. The system used by it will be helpful in the way that it will increase the reliability. Database management results the easy understandable work process among the employees^[6].

Therefore, we can say that carefully crafted investments in global information technology offer firms an opportunity to increase control and enhance coordination, while opening access to new global markets and businesses. But engineering such global systems presents numerous challenges to management.

MATERIALS AND METHODS

Purpose / Aim of the Research Study: Discovery of high performance generating factors which are involved in the Global Information System is a hard task but many organizations use this system to improve their performance. Despite this, numerous organizations still ignore to invest resources in the information system management within the organizations. This supposition needs to be cautiously tested. This Research Study addresses this hypothesis directly and therefore the focus of the research remains around the question whether (GIS) Global Information system makes a difference in the company's Performance or not. If it does, then which factor (s) appears to be more performance related?

Following are the main objectives of this research study:

- To examine and realize the scope of the Information Technology practices in the Organization and Performance in the Pakistani listed organizations.
- To examine the impact of IT and Globalization practices and organizational market Performance with the dedicated IT departments of the Pakistani listed organizations.

Research Design:

Sampling Technique: In this research, "Convenience Sampling" (a form of Non probability Sampling) has been used. This technique is used to make research process faster by obtaining a large number of completed questionnaires quickly and economically.

Only listed cellular companies having hundred employees were selected for the study. The postal addresses of the registered offices of these listed organizations were collected and later on questionnaires were mailed to them.

Survey methods (Mail, Interviews, and Telephone):

Management science research studies have used surveys as methods of data collection many times in history. We followed the same approach because secondary data in this field is not available in Pakistan. Due to the shortage of time and limited budget, we initially used mail survey for data collection. Through this method we collected responses from the listed organizations, but few problems reduced the response rate efficacy e.g. IT managers from different organizations were not quick in responding. To cope up with this challenge, personal one to one interviewing method was conducted. Organizations operating in the Pakistan were personally visited and the questionnaires were distributed to the IT Managers/Executives of the organizations. As a result, the response rate drastically improved. Telephonic interviewing method was also used during some of the phases of this research.

Descriptive surveys were sketched to providing a picture of the ongoing process and relational surveys were developed for empirical analysis. This research was useful for exploring relations between organizational performance and IT practices. For the survey, questionnaires developed consisted of 5 likert scale point, 5 for strongly agree and 1 for strongly disagree.

Response Rate: For concrete research work, information regarding IT practices with reference to Organizational Performance was collected from the IT professionals of the targeted organizations. The IT professionals were requested to respond to all the questions to the best of their knowledge with reference to the IT practices implemented in their respective organizations and also about the market performance of their organizations. There was an open option that any person from the HRM department at the managerial level can fill out the questionnaire. During the data collection process, it was observed that a few organizations were not having a dedicated IT department but other departments like administration and management departments were taking care of the IT activities.

Out of all the companies, the response rate was very high due to adoption of various methods. After data collection, we entered data into Excel 2003 and SPSS 10.0 for analysis. Regression and Correlation analysis were used to calculate results.

Description of the Instruments: This study was conducted on a basic level as there was no data available prior to this research. Therefore a likert scale questionnaire was designed to find out the impact of GIS on cellular companies. Questionnaire was integrated with different acceptance factors as the independent variable. Impact of GIS was chosen as dependent variable. The response rate of these questionnaires was 88%. Statistical tools used were Multiple Regression and Correlation, to find the impact of GIS on cellular companies. It was easy to understand Regression & Pearson Correlation. They both produced extraordinary and significant results.

Variables: Variables are given in Figure 1 and the research model is given in Figure 2. In this research, 9 variables are considered for analysis. Out of these variables, 5 are independent variables, 2 are control variables and 2 are dependent variables. These independent variables are affecting organizational performance.

Questionnaire: The data collection was through questionnaires consisting of dependent variables (impact of GIS on organizational performance), independent variables (IT Application Level, IT Performance, Dedicated IT department, IT Effectiveness, IT Factor) and control variables (life of the organization and size of the organization). The questionnaire was developed depending upon the extensive literature review. In the mentioned research studies, likert scaled questionnaire was used.

Research Model: The research model is developed on the basis of previous research studies, we have included following variables (selection system, training, performance appraisal system, compensation system and employee participation). Equations tested are following: Equation:

$$y = \alpha + \beta_1 (x_1) + \beta_2 (x_2) + \beta_3 (x_3) + \beta_4 (x_4) + \beta_5 (x_5) + \epsilon$$

$$CA = \alpha + \beta_1 (I-L) + \beta_2(I-P) + \beta_3(I-D) + \beta_4(I-E) + \beta_5(I-F) + \beta_6 (QI) + \epsilon$$

Where as:

- $X_1 = I-L = IT \text{ Application Level}$
- $X_2 = I-P = IT \text{ Performance}$
- $X_3 = I-D = Dedicated \text{ IT department}$
- $X_4 = I-E = IT \text{ Effectiveness}$
- $X_5 = I-F = IT \text{ Factor}$

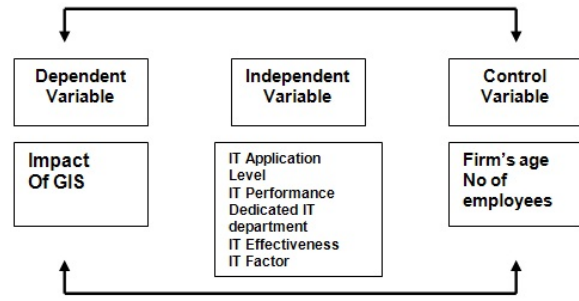


Fig. 1:

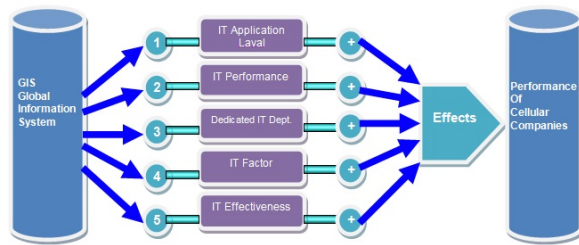


Fig. 2:

Hypothesis:

- *H1.* IT Application Level (I-L) has a positive effect on cellular companies’ performance (Sood, et al 1999).
- *H2.* IT Performance (I-P) has a positive effect on companies’ performance
- *H3.* Dedicated IT dept (I-D) has a positive effect on cellular companies’ performance
- *H4.* IT factor (I-F) in companies has a positive effect on performance
- *H5.* IT effectiveness (I-E) has a positive effect on companies’ performance (Zhongming Wang, 2006).

RESULTS AND DISCUSSIONS

The strength of the relationships between several variables, “Pearson Product Moment Correlation Co-efficient” is used for findings. In this tool, both the variables are treated symmetrically, i.e. there is no peculiarity between dependent and independent variables. Two variables are said to be correlated if they tend to vary at the same time in the same

Table 1: Correlations of Variables

	I-GIS	I-L	I-P	I-D	I-E	I-F
Impact of GIS	1					
IT application level	0.18	1				
IT performance	0.53	0.25	1			
Dedicated IT dept.	0.75	0.30	0.60	1		
IT effectiveness	0.29	0.29	0.38	0.61	1	
IT factor	0.35	0.32	0.40	0.41	0.35	1

Table 2: Descriptive statistics mean & standard deviation

	Mean	SE	Median	Mode	SD	SV	Range	Minimum	Maximum	Count
I-GIS	4.07	0.01	4.11	4.11	0.21	0.04	1.67	2.89	4.56	234.00
I-L	3.65	0.04	3.50	3.50	0.28	0.34	3.50	1.50	5.00	234.00
I-P	3.97	0.02	4.00	4.00	0.48	0.09	1.33	3.33	4.67	234.00
I-D	4.73	0.02	3.92	4.33	0.65	0.14	1.83	3.00	4.83	234.00
I-E	3.70	0.02	3.83	4.00	0.30	0.13	1.83	3.17	5.00	234.00
I-F	3.88	0.03	3.80	3.20	0.37	0.21	2.00	2.80	4.80	234.00

direction. If both the variables tend to increase or decrease together, the correlation is said to be direct or positive. When one variable tends to increase and the other variable tends to decrease, the correlation is said to be negative or inverse.

Table 1 is showing correlations for all the variables and Table 2 is signifying descriptive statistics which cover values of standard deviations, means, median, mode, minimum, maximum values and ranges. There is a high correlation amongst the independent and dependent variables. Especially between dedicated IT departmentalization and impact of GIS, correlation is (0.75). Mean of the dedicated IT departmentalization is (4.73), whereas standard deviation is (0.65). This means that the dedicated IT departmentalization played a vital role in performance of Cellular Company. Correlation (0.61) between dedicated IT departmentalization and IT effectiveness is also very high which points out that dedicated departmentalization and effectiveness is also playing a very critical role in performance of cellular companies in Pakistan. Mean of the IT dedicated departmentalization is (4.73), whereas standard deviation is (0.65). IT performance with GIS impact is showing (0.53) correlation, means the IT performance is also very important in Performance of Cellular companies. The mean and standard deviation is (3.97) and (0.48) respectively. Correlation between IT factor and impact of GIS is (0.35) with mean (3.88) and standard deviation (0.37). Coefficient of correlation between IT effectiveness and impact of GIS is (0.29), along with mean (3.70) and standard deviation (0.30). Correlation between IT application level and impact of GIS on performance is (0.18), with mean (3.65) and standard deviation (0.28).

Coefficient of correlation between IT effectiveness and dedicated IT departmentalization is (0.61), the results show that the IT effectiveness increases performance of company. Correlation between dedicated IT departmentalization and IT performance is (0.60), which indicates that IT dedicated departmentalization also increases IT performance.

Table 3: Regression

Regression Statistics		
Adjusted R Square		0.48
	Coefficients	P-value
Intercept	2.91	0.58
IT application level	0.10	0.02
IT performance	0.43	0.04
Dedicated IT dept.	0.55	0.05
IT effectiveness	0.15	0.02
IT factor	0.35	0.03

We have computed sample mean, the highest mean of IT dedicated departmentalization (4.73) is specifying that it is the main factor which is affecting the performance of cellular companies with the impact of GIS. But IT application level illustrated the lowest mean (3.65), highlighting that it is not a major contributory factor of performance of cellular companies with GIS impact.

Regression: For calculating the contribution of independent variable towards dependent variable, we adopted Multiple Regression.

Table 3 confers the regression conclusions. This table shows that by increasing 1 unit of dedicated IT departmentalization, performance of the company will increase by (0.55) units which means this variable is having strong impact on companies performance. This result is significant at 5 %. Likewise if 1 unit of IT performance is increased (0.43) a unit, the performance of company is increased with significance of 4%, showing a positive impact on company's performance. By increasing 1 unit of IT factor, (0.35) of companies performance is increased, which means this variable has an impact on the performance of cellular companies. This result is significant at 3%. If 1 unit of IT effectiveness and 1 unit of IT application level are increased, (0.15) and (0.10) will be increased respectively of company's performance which has a very small impact on performance of the cellular companies. This result is significant at 2%. So if IT effectiveness is increased, there will be a great impact on the performance of cellular companies.

Conclusion: This study concludes that there is an enormous performance in the cellular companies of Pakistan. There are still many changes to occur in this field but the impacts of GIS will also have its effect on the company. By using different statistical tools like correlation and regression we come to know that IT effectiveness and Dedicated IT departmentalization are the main factors which really have an effect on the cellular companies in Pakistan. The other factor is IT factor which is also very useful in company's performance in Pakistan. These factors have a strong and positive effect on cellular companies. Global Information System is taking its way in different companies of the country due to which almost all the companies shifted from traditional information system to global information system. But in Pakistan, IT application level and IT effectiveness are the major factors. In future, further research could be a thorough study on the impact of GIS on the performance of cellular companies of Pakistan. The study can be conducted by keeping in mind the further performance and chiefly the other information systems in companies. This research study can be helpful for the managers if they want to broaden their performance, keeping in mind the factors like IT application level and dedicated IT departmentalization of the companies and IT performance in them.

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