Impact of information systems quality for the performance of the public sector organizations in Western Province – Sri Lanka

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Abstract- Since the widespread commercial availability of computing technologies, Information systems (IS) have been a dominant application era of computing. They are a best concept in information and communication technology (ICT) which helps to make life easier and increase efficiency. Organizations spend a large amount of money to implement IS. But organizations do not get the actual impacts from IS when compared with the investment cost that they use to implement IS. One reason for this is the quality of the IS.
This research is carryout with the objective of recognize and analyze the system quality of information systems for the organization's performance of public sector organizations in Western Province (WP) – Sri Lanka (SL) and to present a better solution for the problem.

Index Terms- Information systems, Performance, Public sector, Quality

I. INTRODUCTION

Architecture of IS can assist an organization in automating organization's manual process. This automation can save money, time, and resources and also it enhances the organizational workflow. In present public-sector organizations also started to take the usage of IT based solutions rapidly along with the recent e-government initiatives. Public sector is a major contributor to the economic development of country. Various steps have been taken by the government to improve the quality and accountability of organizations in the public sector. They are trying their best to develop their manual system into a valuable computerized IS.

Providing e-solutions for the government by using ICT concepts like internet, telecommunications and computers with the purpose of providing convenient, economical and efficient government. E-governance provides a more flexible and innovative framework to address the opportunities and challenges that exist in an increasingly networked world. By putting government services in IS, effectively managed systems reduce bureaucracy and enhances the quality of services in terms of time, content and accessibility. This results in high quality services to the citizens from government.

According to the survey findings gathered by Information & Communication Technology Agency of Sri Lanka (ICTA) they found that nearly 100% of the government organizations in Sri Lanka now use proprietary application software packages for organizations' productivity. For general purposes 81% of the organizations use the ICTA promoted Computerized Integrated Government Accounting System (CIGAS) application package for accounting and finance and 76% use the Government Payroll System (GPS) for payroll. Most of the government organizations do not use a specific application package for human resource administration but a very small percentage used software for time and attendance. With regards to Sinhala and Tamil language packages over 90% preferred proprietary application software and also use the ICTA promoted Unicode Tool Kit (14%).

While much progress has been made by many governments, the full potential of digital government remains largely untapped. Many transactional and payment services are still not available end-to-end online. Service delivery in government institutions has not been effective for a long time. Customers have to wait for a long period of time at various departments counter which leads to a lot of time wastage. The functionality and user experience of IS designed and run by government leave a question whether IS makes best practices. Government organizations always try to deliver a good service to their citizen customers and they always try to make use of ICT for the purpose of enhancing good governance.

Organizations invest significant resources, huge amounts of money and countless hours in the adoption and implementation of different kinds of IS. But after implementing such systems still there is a question regarding the effective use of these systems. That means it is important to have a high-quality system to increase the performance.

There is empirical evidence that organizations are confronted with many IS management problems and issues such as little integration or coordination between IS (Menon, Lee & Eldenburg, 2012) and poor quality of information products including lack of consistency (Yang and Papazoglou, 2012), duplication (Basili and Caldiera, 2010), and out-of-date information (Bernstein et al., 2009).

By considering this new technological environment with the increased need for better IS, this study will seek to establish how the system quality of IS affects for the performance of the government organizations under the system quality dimension. System quality is the independent variable and organization performance was identified as the dependent variable. Following are the hypothesis between dependent variable and independent variable.

Hypotheses 1 (H1): There is a positive impact of System Quality of the IS on organization performance.
Hypotheses 2 (H0): There is no impact of System Quality of the IS on organization performance.

II. RESEARCH ELABORATIONS

As this research is to find the impact, quantitative methods of collecting data is used. The data collection survey is done using a structured questionnaire and distributed among government employees in Western Province. The questionnaire consists of nearly 10 questions. They are based on the quality issues of the IS such as user-friendly, reliability and speed. Questions were prepared in both Sinhala and English to avoid the inconvenience of understanding. Likert scale of 1-5 was use (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree) to get the response of the users.

Target Population of the research is 200 IS users in the Public-Sector organization in WP – SL. From that 180 was filtered according to the accuracy and the non-probability sampling method. The responses for the surveys is being collected within two weeks.

When distributing the questionnaire, the data was collected in two ways, which are by using paper-pencil questionnaires and internet-based questionnaires. Paper-pencil questionnaire data collection method was use to collect data from employees who didn't had a proper knowledge to use the internet-based questionnaire because they were not familiar with the new internet techniques.

To analyze the data obtained from questionnaire, univariate and bivariate analysis were used. Data analysis software, statistical package for social sciences (SPSS) was used to analyze responses. The independent and dependent variable of this research model were measured by using questionnaire with five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". And as mentioned in below table points were allocated from 1 to 5 respectively for all positive questions in the questionnaire.

Table 1: Scale for Statements

Variable	Levels of measurement
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

The mean value of the five-point scale was 03 (i.e. {1+2+3+4+5}/5=3). Therefore, this mean value was taken as the deciding factor for the impact of the IS. So, the decision rules can be defined as below.

Information System
Let "X" be the average score of the respondents for impact of IS.
•If "X" >3, then the impact of Information System is High.
•If "X" =3, then the impact of Information System is Satisfactory.
•If "X" <3, then the impact of Information System is Low.

Organizational Performance

Let "Y" the average score of the respondents for Organizational Performance.

•If "Y" <3, then the employee Organizational Performance is Poor.

•If "Y" =3, then the employee Organizational Performance is Satisfactory.

•If "Y" >3, then the employee Organizational Performance is Good.

III. RESULTS OR FINDINGS

Frequency Distribution Analysis for the System Quality

As indicated in the below table, the mean value of the distribution of system quality is 3.75. Since it is higher than 3, it can be said that system quality is "High" according to the decision rules. Therefore it can be identified as the performance of the public-sector organizations have high level of System Quality in their Information Systems. The skewness and Kurtosis of the distribution is -0.416 and 0.034 respectively, which indicates that the data recorded for the System Quality are approximately normally distributed.

Table 2: Frequency Distribution Analysis for the System Quality

Statistics		
System Quality		
N	Valid	180
	Missing	0
Mean		3.75
Std. Error of Mean		0.074
Median		3.83
Mode		4
Std. Deviation		0.664
Variance		0.441
Skewness		-0.416
Std. Error of Skewness		0.269
Kurtosis		0.034
Std. Error of Kurtosis		0.532
Minimum		2
Maximum		5

Frequency Distribution Analysis for the Organizational Performance

As indicated the below, the mean value of the distribution of Organizational Performance is 3.72. Since it is higher than 3, it can be said that Organizational Performance is "High" according to the decision rule. Therefore, it can be identified as public-sector organizations have high level of Organizational Performance by using Information Systems. The skewness and Kurtosis of the distribution is -0.509 and 0.147 respectively, which indicates that the data of recorded for the Organizational Performance are approximately normally distributed.

Table 3: Frequency Distribution for the Dimensions of Organizational Performance

Statistics		
Organizational Performance		
N	Valid	180
	Missing	0
Mean		3.72
Std. Error of Mean		0.083
Median		3.83
Mode		4
Std. Deviation		0.743
Variance		0.552
Skewness		-0.509
Std. Error of Skewness		0.269
Kurtosis		0.147
Std. Error of Kurtosis		0.532
Minimum		2
Maximum		5

Simple Regression between System Quality and Organizational Performance.

To perform bivariate analysis, correlation analysis and the simple regression analysis were used. These two types of bivariate analysis methods were used to identify whether there is any relationship between the Quality of the Information System and Organizational Performance.

Table 0: Model Summary of System Quality

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.734[a]	0.539	0.533	0.508

a. Predictors: (Constant), System Quality

As Table 4, the analysis suggested that R square value was 0.539 express that 53.9% of the variance of the Organizational Performance explained by the System Quality.

Table 5: ANOVA[a] of System Quality

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.485	1	23.485	91.077	.000[b]
	Residual	20.113	78	0.258		
	Total	43.599	79			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), System Quality

As seen in the Table 5, the F value is 91.077, which is significant 5% (p=0.000), which suggests that System Quality have significantly explained 53% of the variance of Organizational Performance.

Table 6: Coefficients[a] of System Quality

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.645	0.327		1.971	0.052
	System Quality	0.821	0.086	0.734	9.543	0.000

a. Dependent Variable: Organizational Performance

According to table 6 regression equation of System Quality and Organizational Performance in Public-Sector Organizations in WP, Sri Lanka is:
Organizational Performance = 0.645+ 0.821 (System Quality)

The b value of the equation, the gradient of the regression, is 0.821, which is significant at 1% (significant = 0.000). It indicates when the System Quality will increase by one unit, Organizational Performance will increase by 0.821.

According to above table, the results impact on System Quality and Organizational Performance in Public-Sector Organizations – WP, SL, the regression coefficient is 0.734, which is significant at 1% (p=0.000). Therefore, according to the results, hypothesis is accepted Hence the data support the hypothesis that there is a positive impact on System Quality and Organizational Performance in Public-Sector Organizations – WP, SL.

IV. CONCLUSIONS

Findings of this research proved that the system quality of the IS positively impacts on the organization performance. Even though public-sector organizations are considered to be low performing organizations it is clear that IS are a critical success factor to increase the performance of the public-sector organizations in Sri Lanka. According to the findings of the research, there is no negative impact of IS on organization performance. That means IS are better than manual or traditional data storing methods and IS are a significant element to improve the organizational performance. Based the research findings of the study, following recommendations will extremely useful when developing systems to public sector organizations in Sri Lanka. An organization can use IS to increase their performance if they consider these factors.

Moreover, these kinds of software need accounting knowledge otherwise it is difficult to understand. Hence, recommendation is to use customized software that is developed for organization purpose instead of using readymade systems. According to Pushpakumara et al. (2014) attempts aimed at improving the IS success at public sector organizations need to focus on developing a central ICT policy and adopting consistent and interoperable solutions rather than ad hoc locally.

In order to improve the system quality of an IS, software provider has the responsibility of making user-friendly systems with good user interfaces. If the user interface is eye-catching then the intention to use the system become high. Because most of the government employees are senior citizens, it is important to make interfaces in clear and understandable manner. For the system to be reliable, both the user and the vendor must have the understanding of requirements. Additionally, a common framework for software lifecycle process must be developed. It is recommended to involve top executives in the organization to ensure the system is with the preferred requirements (Hironishi 2008). According to Torkestani and Mazloomi (2014) recommendation for forming a task force of IT professionals to implement the system with the latest technological advances was mentioned in their research.

REFERENCES

[1] Almazán, D.A, Tovar,Y.S.,and Quintero,J.M.M. (2016) 'Influence of information systems onorganizational results', Contaduría y Administración 62 (2017) pp321–338.
[2] Basili, V. R. and Caldiera, G. (2010) Improve Software Quality by Reusing Knowledge and Experience, Sloan Management Review 37, 55-64
[3] Bekkers, V., & Zouridis, S. (1999). Electronic service delivery in public administration: Some trends and issues. International Review of Administrative Sciences, 2, 183-195.
[4] Blanton, J.E., Watson, H.J. and Moody, J. (1992) 'Toward a better understanding of information technology organization: a comparative case study', MIS Quarterly, 16(4), pp.531–555.
[5] Chan, H., Siau, K. and Wei, K. (1998). The effect of data model, system and task characteristics on user query performance. ACM SIGMIS Database, 29(1), p.31.
[6] Coombs, C.R., Doherty, N.F. and Loan-Clarke, J. (2001) 'The importance of user ownership and positive user attitudes in the successful adoption of community information systems', Journal of End User Computing, 13(4), pp.5–16.
[7] D'Ambra, J. and Rice, R.E. (2001) 'Emerging factors in user evaluation of the World Wide Web', Information & Management, 38(6), pp.373–384.
[8] Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts.
[9] DeLone, W. H., & McLean, E. R. (1992). Information systems success: the quest for the dependent variable. Information systems research, 3(1), 60-95.
[10] Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. Journal of management information systems, 19(4), 9-30.
[11] Diana.M, ,(2014) Sustainable Performance Of Public Organizations: Shaping A Coherent System For Implementing And Measuring The Concept
[12] Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). New public management is dead – Long live digital-era governance. Journal of Public Administration Research and Theory, 16(3), 467-494.
[13] Grimson, Jane - Grimson, William - Hasselbring, Wilhelm (2012) The SI challenge in
[14] health care. Communication of the ACM, Vol. 43, No: 6, 48-55.
[15] Gupta, B., Dasgupta, S. and Gupta, A. (2008). Adoption of ICT in a government organization in a developing country: An empirical study. The Journal of Strategic Information Systems, 17(2), pp.140-154.
[16] Heeks, R. (2002). Information Systems and Developing Countries: Failure, Success, and Local Improvisations. The Information Society, 18(2), pp.101-112.
[17] Huh, Y.U., Keller, F.R., Redman, T.C. and Watkins, A.R. (1990) 'Data quality', Information and Software Technology, 32, pp.559–565.
[18] Induwara,A.S.(1998)'Review Information Technology Development in Sri Lanka'.
[19] Kim, Ch. K. (2007). A cross-national analysis of global e-Government. Public Organization Review, 7(4), 317-329.
[20] Kositanurit, B., Ngwenyama, O. and Osei-Bryson, K.M. (2006) 'An exploration of factors that impact individual performance in an ERP environment: an analysis using multiple analytical techniques', European Journal of Information Systems, 15(6), pp.556–568.
[21] Krogstie.J, (2017). "Comparing Private and Public Sector on Information Systems Development and Maintenance Efficiency".
[22] Laudon, K. and Laudon, J. (2012). Management information systems, Managing the Digital Firm. Boston: Pearson.
[23] Leclercq, A. (2007) 'The perceptual evaluation of information systems using the construct of user satisfaction: case study of a large French group', The DATABASE for Advances in Information Systems, 38(2), pp.27–60.
[24] Leonard-Barton, D. and Sinha, D.K. (1993) 'Developer–user interaction and user satisfaction in internal technology transfer', Academy of Management Journal, 36(5), pp.1125–1139.
[25] MG Consultants (Pvt) Ltd, (2008), Survey on ICT Usage in the government sector, pages:47
[26] Pushpakumara,H., Wanniarachchige,M.,Peiris,S. and Samantha,R. (2014) "Determinants of Information System Success in Public Sector Organizations: With Special Reference to Organizations Located in the Matara District of Sri Lanka,".
[27] Rainey, H. Backoff, R., and Levine, C. "Comparing Public and Private Organizations," Public Administration Review, March/April 1976, pp. 233-244.
[28] Seddon, P., & Kiew, M.-Y. (2007). A partial test and development of DeLone and McLean's model of IS success. Australasian Journal of Information Systems, 4(1).
[29] Seddon, P. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. Information Systems Research, 8(3), pp.240-253.
[30] Sekaran, U., & Bougie, R. (2010). Research methods for business: A skill-building approach
[31] Shih, H.P. (2004) 'Extended technology acceptance model of internet utilization behavior', Information & Management, 41(6), pp.719–729.
[32] Sørum, H., Medaglia, R., Andersen, K., Scott, M., and DeLone,W. (2012) 'Perceptions of information system success in the public sector: Webmasters at the steering wheel?'. Transforming Government: People, Process and Policy, 6(3):239-257
[33] Vitale, M. (1999). Assessing the Health of an Information Systems Applications Portfolio: An Example from Process Manufacturing. MIS Quarterly, 23(4), p.601
[34] Weill, P. and Vitale, M. (1999). Assessing the Health of an Information Systems Applications Portfolio: An Example from Process Manufacturing. MIS Quarterly, 23(4), p.601.
[35] Wixom, B. and Watson, H. (2001). An Empirical Investigation of the Factors Affecting Data Warehousing Success. MIS Quarterly, 25(1), p.17.

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