

The Development of KPI for Measuring ICT Support Service Quality

Rozi Nor Haizan, N.*, Rose Alinda, A. **, Azizah, A.R. **

* Department of Software Engineering and Information System, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia

** Department of Information System, Faculty of Computer Science and Information System, University of Technology Malaysia

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ABSTRACT

This paper proposes a development of key performance indicators (KPIs) for measuring the quality of ICT support services. The usage of Information and Communication Technology (ICT) cannot be denied in every stage of work by individuals, businesses or organizations. Hence, various categories of ICT services (ICTS) including ICT support services have become important activities that need to be measured from time to time to ensure the advantages of ICT usage. ICT support services had been revealed as one of the five main ICTS categories within the context of Malaysian Universities (MUs). This category of ICTS is referred to as general assistance related to providing ICTS to users. While ICT application systems services and ICT infrastructure services are considered as core services, ICT support services are regarded as peripheral services that indirectly assist ICTS implementation. In part of service quality studies including ICTS, it was proven that previous researches had discussed the assessment, measurement and improvement of their service quality by proposing related models or frameworks. However, there is still a lack of producing a quantifiable approach to measure the ICT service quality (ICTSQ) including the ICT support services. Most of the previous researches were only focused on the initial stage of service quality assessment and measurement. Most of them had only concern on analyzing and identifying various quality factors and attributes based on the context involved. Thus, this paper proposes the development of KPI as being the latest and most effective measureable approach for measuring the quality of ICT support services. This study reviewed the current scope of ICT support services, quality factors and attributes before the KPIs is developed. The investigation is done within the context of Malaysian Universities (MUs). Interviews to ICT support services' stakeholders were conducted within the context to get the empirical data. The KPI development model is intended to provide ideas and guidelines for the purpose of measuring this ICTS.

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Corresponding Author:

Rozi Nor Haizan binti Nor,
Department of Software Engineering and Information System,
Faculty of Computer Science and Information Technology,
Universiti Putra Malaysia (UPM),
43400 UPM Serdang, Selangor, Malaysia.
Email: rozinor@upm.edu.my

1. INTRODUCTION

The usage of Information and Communication Technology (ICT) cannot be denied in every stage of work by individuals, businesses or organizations. It can be defined as technology that is intended to facilitate information processing and communication functions which support individual or organizational activities [1], [2]. Thus, various categories of ICT services (ICTS) that relates to the usage of ICT including ICT support services have become important activities within the particular context involved. The ICT support

services had been revealed as one of the five main ICTS categories within the context of Malaysian Universities (MUs). This category of ICTS is referred to as general assistance related to providing ICTS to users. The roles of these services are to support users in using ICTS by educating them and improving ICT operations. While ICT application systems services and ICT infrastructure services are considered as core services, the ICT support services is regarded as peripheral services that indirectly assist ICTS implementation [11].

In this decade, the influence of a radical dependence growth of ICT throughout various sectors has further created significant concern regarding improvement in the ICTS quality or performance (e.g. [3], [4], [5], [6]). At present, many models and frameworks have been developed in relation to the ICT and ICTS assessment, measurement and improvement in many sectors [7]. However, there is still a lack of producing a quantifiable approach to measure the ICT service quality (ICTSQ) including the ICT support services. Most previous researchers focused on the initial stage of the service improvement study (e.g. determining and defining the service performance factors) [8], [9], [10] and not focusing to define and measure the quality or performance of services by using measurable approach [11].

Hence, this paper proposes the development of KPI as being the most effective measurable approach for measuring the quality of ICT support services. This study is done within the context of Malaysian Universities (MUs) since the institutions act as a promotional role for both the ICT and technological development of the country besides core activities of teaching and learning. Interviews to ICT support services' stakeholders were conducted within the context to get the empirical data. The discussion in this paper proceeds as follows; the first section is concern about the problem emerged in the ICTSQ area as well as, this study proposes a measurable approach for ICT support service quality measurement. Then, the main discussion in this paper, highlights the development of KPIs for ICT support services whereby to develop the relevance KPIs requires consideration to ICT support services scope and its quality concern. The final section summarizes this study and provides a recommendation on furthering KPI development for this ICTS. The developed KPIs and model is intended to provide ideas and guidelines for the purpose of measuring this ICTS.

2. DEVELOPMENT OF KPI FOR ICT SUPPORT SERVICES

Based on researchers in [7], the ICTSQ refers to the performance or accomplishment of routine functioning or activities by ICTS providers in order to fulfill the needs of ICTS users. Thus, for the purpose of measuring ICT support services, it had been measured by considering the current scope of ICT support services that consists of ICT support service types and involved stakeholders. Furthermore, quality factors and attributes for this ICTS had been reviewed before relevant KPIs were developed. To describe on how the KPIs have been developed, the research previously proposed the KPI Model in [7] which involved various components and parties that can be adapted for the process to develop KPI for ICT support services. The KPI model based on the model as depicted in Figure 1.

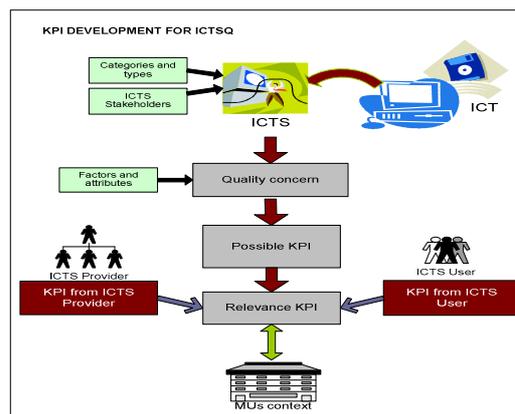


Figure 1. The KPI Model for ICTSQ measurement (R.N.H. Nor, *et.al.*, 2010)

In this study, a basic structure of ICT support service measurement is proposed based on adapted KPI model. The structure established in the form of hierarchical pyramid-like structure as shown in Figure 2. At the top of the pyramid is the overall ICTSQ which consists of ICT Support services as one of the ICTS components for ICTSQ, quality elements for ICT support services and measurements based on relevant KPIs. An ICTS component is the focus area of ICTSQ which includes ICT operational services, ICTS Governance

and ICT Community services. ICT support services are one of the ICT operational services involved in the context of Malaysia Universities (MUs).

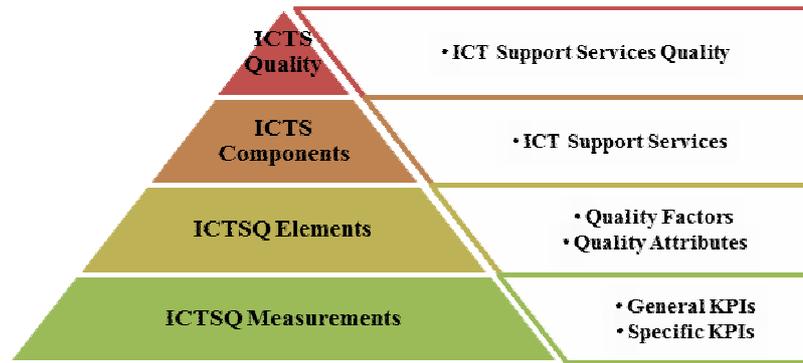


Figure 2. The ICT support services quality measurement structure

2.1. ICT Support Services Scope within MUs Context

The current scope of ICT support services has been discussed through identifying the types of ICT support services under this ICTS category, ICTS providers and users involved in this ICTS [11]. ICTS within the MUs context consists of two co-services, namely; ICT application systems services for academic computing and ICT application systems services for administration computing. While, ICT support services locates on the top of these two co-services as this services is referred as peripheral services that indirectly assist core ICTS implementation. These co-services also get support from ICT infrastructure services besides ICT community services implemented in some MUs were mostly within a stabilized university atmosphere. Besides, the study found that governance for ICTS included as one of the component that need to be measured to get comprehensive measurement of ICTSQ for this context of study.

Furthermore, in the current context of MUs, there are various types of ICTS and stakeholders involved in providing and usage of the ICT support services as can be seen in Table 1. The types of ICTS have emerged or developed changes from time to time, based on business needs of the MUs context. For that reason, this ICTS scope should be reviewed before the measurement is done in order to make the process of measurement more reliable.

Table 1. ICT support services types and stakeholders within MUs context

ICTS CATEGORY	ICTS TYPES	ICT SUPPORT SERVICES'S STAKEHOLDERS
ICT SUPPORT SERVICES	Help desk service Technical support services Technical consultation services Hardware and PC repair services ICT training Service information supply ICT information supply services Free software download services Upgrading software/version control Hotline services**	ICTS Top Management ICTS Providers Centre Distributor External ICTS Users Direct Indirect
** Some new ICTS types within ICTS categories in preliminary findings		

Based on preliminary findings within MUs context, hotline services becomes an important consideration by ICTS providers in ICT support services. It is one of the flexible channels for ICTS users to provide their opinions, complaints and suggestions for ICTS providers informally and spontaneously. Therefore, the function of a hotline service can offer significant influences in improving the performance of ICTS in the context of MUs. Table 2 depicts the example ICT support services' stakeholders involved within one of MUs during preliminary study.

Table 2. Example of ICT support services' stakeholders revealed during preliminary study

ICT SUPPORT SERVICES	Top Management(Provider) CICT director Deputy director of BPP Deputy director of BPA Deputy director of BIS Unit Head of UKLP Unit Head UKKP IT Manager in Faculties	Top Management (User) Library Chief Librarian Officer Treasurer Officer, Treasurer Office Director of Research Management Centre Director of Property Development Office
	Provider Staff of BPA Lesson Technology and Multimedia unit Staff of BPA Operation Support & Academic's Training unit Staff of BIS Complaints and Support Assistance unit Staff of PK Management and Human Development unit UKLP Unit Head Staff of Web and UKKP Knowledge Management	User Staff of Information Service Department, PSZ Staff of Promotion Unit, PSZ Information Management Unit, PSZ Staff of Faculty Library Staff of Finance management and administration, Bursary Deputy of Treasurer Industrial Liaison & Contract Research Department, RMC Lecturer in Faculties Student in Faculties

2.2. Quality Concern for ICT Support Services

The quality concern for ICT support services focuses on quality factors and quality attributes for this type of ICTS. A quality factor is defined as a measurement for ICTS by which to indicate the achievement or performance from the evaluation of the performance score given (e.g. number, percentage) [11]. Each factor may have a particular aspect for measuring the performance based on the determined metric, which is called a quality attribute. Quality factors and attributes are reviewed from previous literature and validated by practitioners during a preliminary study. Interviewed has been done towards ICTS stakeholders to confirmed the quality factors and attributes which had been derived from previous literature. Table 3 depicts the quality attributes of quality factors for ICT support services within MUs context.

Table 3. Quality factors and attributes for ICT support services

ICT SUPPORT SERVICES	Quality factor	Quality Attributes
RELIABILITY		Service done within the timeframe Working done within the reasonable time Service done instantly Service carried out such as is user wanted Service done correctly and professional Service done efficiently especially in critical period Service done correctly in first time
ATTITUDE AND CONCERN BY ICTS STAFF PROVIDER		Guiding attitude Having a commitment from ICTS Ready to give cooperation Willing to help and friendly attitude
SKILLS AND PROFESSIONALISM OF ICTS STAFF PROVIDER		Having knowledge and technical skills Having a skills to communicated Expert in problem solving
SERVICE MARKETING		Ensure campus society know IT facilities is being prepared Introduce service provided to ICTS staff and new student
INFORMATION SUPPLY		Provide the information on IT usage guidance Provide the information which help to enhance the ICTS user knowledge Provide the information which help the ICTS users on their daily ICT tasks Provide the information which can help the ICT community services user Provide information on services status
RESPONSIVE		Ensured the response was done instantly Immediate action on ICTS user request Always have a staff who's ready to assist Follow up the status of provided ICTS
TECHNOLOGY USAGE		To make useful of IT on doing the ICTS Automation of work process which relevant Stored ICTS data electronically Spread the ICTS information online
PROACTIVE		No need many requests from user to take an action Think what is the best for customer Provide ICTS with value added to customer Better ICTS beyond expectation
TRAINING FOR ICTS PROVIDER		Provide continuous training for the staff innovation

2.2. Key Performance Indicators for ICT Support Services Quality Measurement

For the purpose of measuring the ICT support services quality; this study has suggested the development of KPI as well as the latest and effective measurable approach to assess the performance of individuals, businesses and organizations in the service aspect. In addition, KPIs are applied as basic elements in many measurement and assessment frameworks and systems, namely: International Organization for Standardization (ISO), IT Infrastructure Library (ITIL), Control Objectives for Information and related Technology (COBIT) and Balance Score Card (BSC). They are also implemented in numerous organizations in many countries including Malaysia [7], [11].

The KPIs for this ICTS are developed based on reviewed ICT support services types, quality factors and attributes involved within MUs context. Lists of proposed KPIs for ICT support services concerned by ICT support services' stakeholders; top management, providers and users were revealed in the context. In order to obtain relevance KPIs for ICT support services, KPIs suggested by ICT support service's stakeholders during preliminary study and reviewed from literatures were analyzed. Table 4 depicts a list of generic and specific KPIs for ICT support services.

Table 4. Relevance KPIs for ICT support services

	Quality factor	KPIs	Specific/Generic KPI	
ICT SUPPORT SERVICES	RELIABILITY	1) No. of ICTS successful completed as per time frame given 2) Customer satisfaction index based on ICTS implemented 3) No. of complaint received	1) A,B,C,D 2) B,C,D 3) B,C,D	
	ATTITUDE AND CONCERN BY ICTS PROVIDER	4) No. of staff and user which involved in developing and providing ICTS 5) No. of ICTS staff involvement against problems which facing by the users/ICTS recovered 6) No. of reward received by staff providers (e.g. excellent service award/active) etc.	4) B,D 5) B,C,D 6) B,D	
	SKILLS AND PROFESSIONALISM OF ICTS PROVIDER	7) No. of staff with any skill course certificate (e.g. technical skills, communication skills, creative and innovative skills)	7) B,D	
	SERVICE MARKETING	8) No. of ICTS showcase/promotion a year 9) No. of users involved/visit the ICTS showcase/promotion 10) No. of alternative promotion - catalogue, web site, hotline and so on	8) C,D,E 9) C,D,E 10) C,D,E	
	INFORMATION SUPPLY	11) No. of services with complete document (clear work process document, maintenance document, user manual etc) 12) No. of ICTS which its information has been channelled online	11) A,B,D 12) D,E	
	RESPONSIVE	13) Response time on difficulty or complaint by users	13) B,D	
	TECHNOLOGY USAGE	14) No. of latest aid tools used to enhance ICTS performance (i.e. audio video hardware, cctv to monitor etc) 15) No. of new ICTS which introduced within a year 16) No. of ICTS which their information have been channelled online	14) C,D 15) C,D 16) C,D	
	PROACTIVE	17) No. of periodically maintenance a year for ICTS 18) No. of course/training/skill for users implemented within a year 19) No. of new ICTS which introduced within a year	17) C,D 18) B,D 19) C,D	
	TRAINING FOR ICTS PROVIDER	20) No. of course/training for ICTS staff implemented in a year 21) No. of ICTS staff involved in the course/training implemented 22) Employee satisfaction index	20) B,C,D 21) B,C,D 22) B,C,D	
	<i>Indication: A- Governance component B-ICT application system services C-ICT infrastructure services D-ICT support services E-ICT community services</i>			

3. CONCLUSION

The ICT support services have become one of the important ICTS activities that need to be measured from time to time to ensure the advantages of ICT usage. For this ICTS measurement purposes and KPIs development, it is suggested that a review should be undertaken in relation to this ICTS scope; types and stakeholders based on current time. Besides, the quality concern for this ICTS also should be considered which focuses on quality factors and attributes. The importance of reviewing the ICT support services scope within the current context lies in the complexity of this ICTS implementation and measurement. This occurs since the ICT support services itself is diverse, idiosyncratic, clear complex and is continually changing from time to time based on the context involved. This study offers ideas and awareness to various important parties; ICT support services top managements, providers and users in MUs relating to the ICT support services scope, quality concern and KPIs that are involved in this ICTS measurement. Further, this study provides a set of guidance methods in order to measure the ICTS by providing a list of relevance KPIs.

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BIBLIOGRAPHY OF AUTHORS

	<p>Dr. Rozi Nor Haizan binti Nor has acquired her doctorate from University of Technology Malaysia (UTM) in Computer Science. He is currently working as a senior lecturer in the department of Software Engineering and Information System in Faculty of Computer Science and Information Technology (FSKTM), Universiti Putra Malaysia (UPM) Selangor, Malaysia. Her expertise is in the area of Information Systems, ICT services, ICT service quality and ICT Governance</p>
	<p>Professor Dr. Rose Alinda binti Alias is currently working as Deputy Vice Chancellor (Academic & International) at University of Technology Malaysia (UTM). She is very active in academic development at the university level and internationally. She was the deputy dean and dean of the faculty and other units during her tenure. Her expertise is in Information Systems, Knowledge Management, Service Quality, ICT Development and Measurement.</p>
	<p>Associate Professor Dr. Azizah binti Abdul Rahman is a senior lecturer at University of Technology Malaysia (UTM). She was the dean during hertenure. She is very caring and concerned about students especially under her supervision. Her expertise is in Information Systems, Knowledge Management, Service Quality and ICT Services.</p>