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Adopting of Service Level Agreement (SLA) in enhancing the quality of IT hardware service support

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ABSTRACT

Service Level Agreement (SLA) is a contract between a service provider and different levels of users in the organization. SLA lays out the metrics by which a service is measured, as well as penalties should the expected service levels are not met. SLA reduces the amount of job schedule based on IT support services and transfers all IT-related problems to the service provider. Existing SLA approaches have several limitations including pricing strategy, incident handling, and documentation. A more "customized" approach needed for SLA Hardware based on the organization's mission and vision. Adopting the SLA also act as a KPI (Knowledge Performance Index) for the internal services that reflect back to the company performance and users experiences. This paper proposes a research framework study for such as framework based on strong theoretical foundation and industry best practice and can be apply to organization or company that does not have the SLA system on the IT service support environment. This adoption SLA only for IT hardware (Break and Fix)

1.0 INTRODUCTION

Service Level Agreement (SLA) is a contract that defines services that a vendor provides to the client, detailing the agreement, terms used, parties involved, and ways in which disagreements or changes are negotiated. Service Level Management (SLM) pertains to the management and monitoring business relationship defined by an SLA. The SLA is best viewed as a hierarchy of Service Level Clauses (SLC) where each SLC defines an element of the services provided, performance targets, means for measuring the vendor's performance, penalties or bonuses for under or over-performance, and the client's obligations.

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To date, efforts in SLA mainly focus on the software part of IT services for example Cloud Computing, Data Storage, and Application Development. There is limited work (if any), that investigates SLA for hardware parts and/ or systems.

Hardware SLA (H-SLA) would tremendously benefit business organizations. First, it reduces operating costs as there would not be any recurring costs to organizations in contrast to the current annual increase of 2% to 5%. Secondly, H-SLA would better support organizations in meeting its aims and objectives as it utilizes metrics found in recognized frameworks including ITIL, COBIT and CMMI SVC. Third, H-SLA (Hardware-Service Level Agreement) promotes comprehensive documentation of incident request and handling, hence reducing time for troubleshooting and parts replacement.

Adopting the Service Level Agreement (SLA) based on the rules and procedures that meet the company or organization to meet the certain standard to achieve based on the mission objective and standard policies that imply to the organization. A process need to be clear and understood by the stockholder, employees and lastly the end users.

As such, this paper proposes a research study to investigating the enhancement of software-dominated SLAs to include hardware-specific aspects of IT services.

Again, adoption SLA (Service Level Agreement) from the industries and research perspective can be apply to those company that do not have the SLA system for the daily IT support service or have the SLA for the overall IT services but not specifying on hardware components.

This paper is organize as follow: Section 2 presents the review of relevant literature in SLA and IT services. Section 3 entails the research framework while the expected outcome of this research is presented in Section 4. Finally, conclusion and future work are presented in Section 5.

2.0 REVIEW OF RELEVANT LITERATURE

Service Level Agreement

Service Level Agreement (SLA) is formally defined as the "agreement between an IT service provider and a customer, describing the service, service level targets, and the responsibilities of the provider and customer" [1] Another definition stipulates that SLA is "a formal negotiated agreement between the service provider and the customer, designed to create a common understanding about the quality of service, priorities, and responsibilities. [2]. SLA covers many aspects in the provider-customer relationship, including performance of services, customer care, billing, and service provisioning. A single SLA may cover several IT services or customers. A SLA should consist of the following elements namely, services into categories (sections for catalogue), listing of each category as a service catalogue section, establishing integrated, packaged or bundled service products, identification of modular service products , definition of each service product, establishing service owner and supplier, defining procurement procedures, specifying service level metrics (availability, reliability, response), defining limits of service and defining customers responsibilities thus it provides a basis for managing the relationship between the service provider and the customer, describing the agreement between the service provider and customer for the service to be delivered, including how the service is to be measured.

a) IT Services

IT services is defined as "a service provided to one or more customers by an IT service provider, based on the use of IT to support the customer's business processes". IT services is defined in SLA and involves a combination of people, process and technology. An IT service provider may provide SLA to its "internal business customers" [3]. Majority of business organizations in Malaysia outsource their IT servicing needs. IT service provider usually offer standard service levels. The process that addresses SLA definition and monitoring is known as Service Level Management [4] and is part of a broader framework of IT Service Management

[5]. Multinational Corporations (MNCs) including as Shell and ExxonMobil use external SLAs from reputable IT service providers such as Getronics and SSCS.

Outsourcing exposes organizations to numerous risks such safety, dependency to a specific service provider, changes in organizational policy and process, and defining service parameters for ensuring service quality [6]. Organizations may end up paying up more than 50% in front-end costs than initially expected [7], achieving only 15-%-25% cost savings in contrast to the expected 35%-40% [8].

SLA and IT Services

SLA reflects the organization's IT services in terms of hardware, software, and supporting infrastructure to support and manage organizational functions and operations. IT services provides strategic business information through a heterogeneous information processing capabilities [9]. The quality of IT services (QoS) is the description or measurement of the overall performance of a service and determined when the provider performs the service for the customer. In order to improve IT services, customer satisfaction should be taken into account. SLA reduces the amount of job schedule based on IT support services and transfers all IT-related problems to the service provider. [10]

Research Efforts

Related works to support practitioners for preparing, negotiating and monitoring SLAs include IT advisory service. [11] More specific SLAs include library services, electronic commerce, computer networks, bus services and enterprise networks.

Research and development efforts has focused on the application SLAs, leaving the theoretical part with less interest from both the academia and industry implemented in computer, central support services, hospital services, supply chains, telecommunications, TQM and organizational departments.

Issues in implementing Hardware Base SLA.

There are three (3) challenges for realizing Hardware Base IT SLA services namely.

- People: Human failure is defined as "inappropriate or undesirable human decision, action or behaviour that reduces or has the potential for reducing the effectiveness, safety or performance of a system" [12]. Human decision is unpredictable without the facts. Behaviour that reflect to the environment process.
- Process: Misconception of IT service deliverables occurs when an SLA has not been carefully planned, discussed and documented. These difficulties can manifest into poor service levels and disputes. [13] Things are not clear in the SLA is usually in the availability of services to be provided by the SP. Where availability is specified in the SLA cannot be measured clearly. While the specifications were left incomplete elements that do not take into account the needs of the services required which can lead to misunderstanding responsibilities of the SR and SP.
- Technology: Traditional helpdesk and service desk systems are manually intensive and are yet to utilize the full potential of IT. For example, IT-related problems are reported by phone calls or intercom in the organization. These systems have to be upgraded, incorporating (new) process, people and tools [14]. In addition, current tools do not support effective measurement. [15], these tools should enable effective measurement of resolution times and support requests including process performance [16]. Using the appropriate tools can enhance the customer services and reflects the effective time to solve and incident.

3.0 RESEARCH FRAMEWORK

The proposed research framework consists of six (6) phases namely literature Study, Framework development, Model Development, Framework Revision, Model Validations and lastly the Report writing based on the output findings. (Fig. 2).

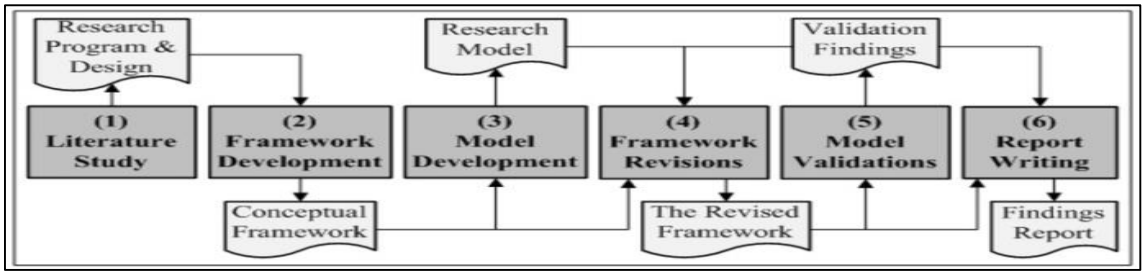

Figure 2: Research Framework

On the literature part, articles, journal and conferences paper will be the process to demonstrate based on the field of the research. It's to justify the reason for the research and allows establishing the theoretical framework and methodological focus based on the research program and design. Framework development sample from the theory research and practical research from the IT services concepts will be used as a guide to develop the research model based on the conceptual framework. From the conceptual framework based will be the model development. At this stages many input from the quality part versus the standard framework will be adjust according to the field of the research. Research model will be validate and revise back to adjust with the output of findings sample from the organization. Lastly will be the report writing based on the findings output will be used as guidance to the IT support service that only focus on hardware parts. (break and fix)

Information Gathering

In this phase, the theoretical aspects of SLA (Service Level Agreement) and IT (Information Technology) services will be investigate. Existing standards and frameworks such as ISO 20000, ITIL, COBIT and CMMI will be analyzed to identify the main components of SLA and IT services. In addition, relevant literatures such as academic publications and industry best practice (white papers) will also be exhausted. Result of this phase represents state-of the-art and current issues in this field. Refer to figure three below: Matches standard and framework towards the SLA QHS (Service Level Agreement, Quality Hardware Services). Standard taken from ISO 20000, off course lots of ISOs in the IT services. Choosing the ISO 20000 is the most reflecting to this research study. The ISO 20000 series distinguishes the best processes practices, which do not depend on the organizational format, size, organization names or its structure. It is applicable to both the large or small sized services supplier, besides the requirements of best practices of services processes do not change according to the organization format or policy. Supported by the three framework ITIL, CMMI and the COBIT. Although the three framework overlaps on each other according to the similarities but not intended to replace the originality of their own services processes.

Difference between standard, model and framework.

In order to classify the IT frameworks, it seems interesting to delimit the meaning assigned to each term. By studying the IT frameworks for this research study, choice focused on a set of standard and frameworks presented below [17]:

- ISO/IEC 20000: Published officially on 10 November 2005 by the international Organization for standardization, the ISO 20000 standard derived from the BS 15000

standard developed by the British Standards Institute in 2000. The main contribution of the ISO 20000 version is to establish certification targeting the management of IT services, things that was absent in the international standardization.

- CMMI (Capability Maturity Model Integration): Designed in 1997 in the initial form of the CMM by the Software Engineering Institute (SEI) of Carnegie de Mellon University. Today, CMMI is use as a framework for systems engineering and software acquisition.
- COBIT (Control Objectives for Information and Related Technology): Created in 1996 by ISACA and ITGI, Co-bit is a reference system for governance and audit of the information system. It aims to link business risks, control needs and technical issues based on Best practices in IT auditing. Cobit is complement by VAL IT, which focuses on IT investments returns for value creation.

From Table one below, all of the frameworks seem to have information about the IM, which make possible suitable frameworks to provide inputs to the research study.

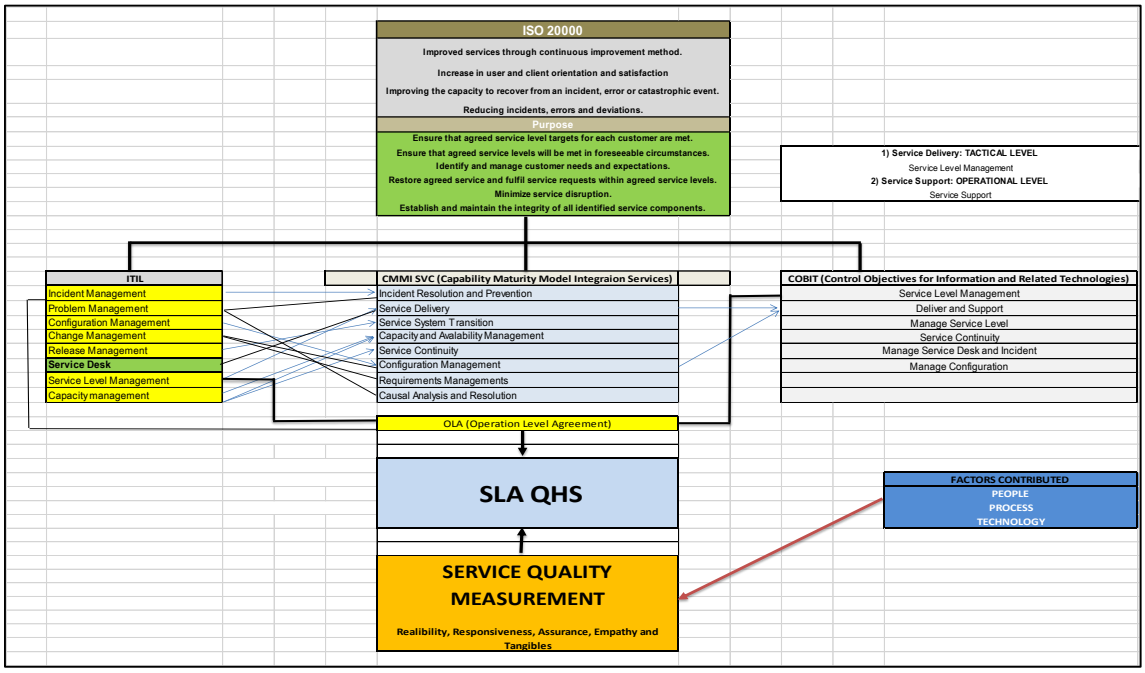

Figure 3: Matches standard and framework towards the SLA QHS (Service Level Agreement, Quality Hardware Services)

Table 1: IT Frameworks Comparison (Adapted from: An overlap less incident management maturity model for multiframework assessment (ITIL, COBIT, CMMI-SVC). Joao Aquiar (2018)

	ITIL	**CMMI-SVC**	**COBIT**
Founded	OGC	Software Engineering Institute (SEI	ISACA
Last Update	July 2011	November 2010	April 2012
Focus	Service	Service	Service
IM	Yes	Yes	Yes
Name of Process	Incident Management	Incident Resolution and Prevention	Manage Service Request and Incidents
Number of Process	26	24	37

Preliminary Study

In the second phase, a survey will be carry out to identify the current practice of SLA (service Level Agreement) and IT (Information Technology) services in IT organizations especially on IT service support on the hardware maintenance in several organization from the different business perspective. The survey will also shed light to the role it plays in the outsourcing activities. Software practitioners in the public sector, higher education institutions, and the private sector will be included in the survey. The survey instrument will be validated by an expert group, representing the target respondents. Results of this phase represented the practical aspects of SLA. Results of this survey will be one of the contributions of this research.

Model Development

Results from the first two phases will be analyze and factors that promote and inhibit to the successful SLA QHS (Service Level Agreement Quality Hardware Services) will be identify. Relationships between these factors will be classified and mapped against the main components of SLA (Service Level Agreement), forming a new, hardware-centered SLA model for IT organizations. This model is the major contribution of this research.

Validation

Finally, the proposed model will be validated qualitatively and quantitatively by means of expert reviews (qualitative) and implementation of the model at selected IT organizations (quantitative). The model will be revised and validate based on the results of both validations.

4.0 EXPECTED RESULTS

Expected results include, but not limited to the upgrade of existing, software dominated SLA, to include hardware aspects of IT services. SLA is commonly associated with software applications, operating systems and cold storage. This study would provide insights to a hardware-centred SLA, adopting the 'break and fix' concepts for IT services. In addition, this study would contribute to the enhancements to current IT policy in the selection of hardware vendors based on respective organization's SLA. These SLAs can be mapped with individual organization business objectives and needs, hence supporting a more informed decision-making activity in vender selection. Results of this study could also be referred by organizations in setting up their IT policy or enhancing current policies to include hardware services.

5.0 CONCLUSION AND FUTURE WORK

The conclusion will be based on the case studies on the TATIUC College IT departments. After the completion of this research study will be used as guides on the TATIUC College itself or any other organization that obligate to use this model as guidance to the internal SLA (Service Level Agreement) made. Findings from paper also contributed to the body of knowledge and can practically implement on others organization using the same services. Component from the validation output, expert IT reviews and the IT service model itself as a guide to the tailor made SLA internally. This paper also will be as a guide to the other IT service practise and can be used as a sample towards the internal SLA IT service environment. The direction of the SLA IT services will be a virtual system concepts using the IOT (Internet of Things) system that can be used in anywhere of the world.

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