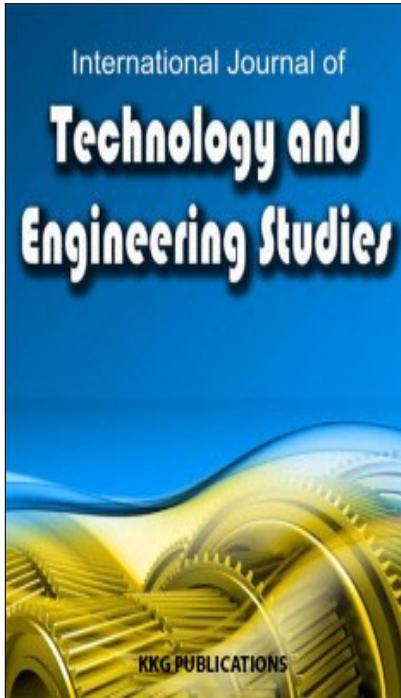
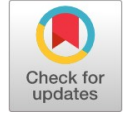


This article was downloaded by:
Publisher: KKG Publications



Key Knowledge Generation

Publication details, including instructions for author and subscription information:

<http://kkgpublications.com/technology/>

ITIL: Implementation and Service Management Best Practices in Malaysian Academic Libraries

ZAINAB AJAB MOHIDEEN ¹, KIRAN KAUR ², SUKMAWATI MUHAMAD ³,
NOOR AZLINDA WAN JAN ⁴, A BASHEER AHAMADHU ⁵

^{1, 2, 5} University of Malaya, Kuala Lumpur, Malaysia

^{3, 4} University Science Malaysia, George Town, Malaysia

Published online: 15 April 2017

To cite this article: Z. A. Mohideen, K. Kaur, S. Muhamad, N. A. W. Jan and A. B. Ahamadhu, "ITIL: Implementation and service management best practices in Malaysian academic libraries," *International Journal of Technology and Engineering Studies*, vol. 3, no. 2, pp. 65-73, 2017.

DOI: <https://dx.doi.org/10.20469/ijtes.3.40004-2>

To link to this article: <http://kkgpublications.com/wp-content/uploads/2017/3/IJTES-40004-2.pdf>

PLEASE SCROLL DOWN FOR ARTICLE

KKG Publications makes every effort to ascertain the precision of all the information (the "Content") contained in the publications on our platform. However, KKG Publications, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the content. All opinions and views stated in this publication are not endorsed by KKG Publications. These are purely the opinions and views of authors. The accuracy of the content should not be relied upon and primary sources of information should be considered for any verification. KKG Publications shall not be liable for any costs, expenses, proceedings, loss, actions, demands, damages, expenses and other liabilities directly or indirectly caused in connection with given content.

This article may be utilized for research, edifying, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly verboten.

ITIL: IMPLEMENTATION AND SERVICE MANAGEMENT BEST PRACTICES IN MALAYSIAN ACADEMIC LIBRARIES

ZAINAB AJAB MOHIDEEN ^{1*}, KIRAN KAUR ², SUKMAWATI MUHAMAD ³,
NOOR AZLINDA WAN JAN ⁴, A BASHEER AHAMADHU ⁵

^{1, 2, 5} University of Malaya, Kuala Lumpur, Malaysia

^{3, 4} University Science Malaysia, George Town, Malaysia

Keywords:

ITIL
ITSM
IT Governance
Library Services
Academic Library

Received: 04 November 2016

Accepted: 12 February 2017

Published: 15 April 2017

Abstract. This study presents the existing Information Technology Infrastructure Library (ITIL) framework in a University library. This framework exists when there is IT service management and delivery in the library. This study is conducted in Malaysian academic libraries. The library is the knowledge servicing department in a higher learning institution. The library serves the knowledge in the form of digital services. Hence, the IT implementation and service management in the library have increased system usage over the years. The framework is adopted for IT governance and ITSM to fill the gap of digital information services. There are two main IT services in the library, which are digital information and IT infrastructure. These services are aligned with the existing standardization of IT services in the library. Results show that ITIL for Malaysian Academic Libraries has the right process at the right place and a turnaround for conventional methods for service management and delivery.

INTRODUCTION

ITIL is a set of framework, industry specific and best practices. It is the acronym for Information Technology Infrastructure Library. The service management component in ITIL framework is known as Information Technology Service Management (ITSM) [1]. The ITIL framework and the ITSM components are used to manage IT services [1]. ITIL is a set of documented practices and the ITSM is to meet the documented requirements [1], [2]. An organization's decision on adoption, adaptation and implementation of a best practice framework for information technology is eventually an approach to an ITIL framework [1]. The ITIL is a good fit framework and allows the best fit within organization's culture [3]. In ITIL, the adoption is what is needed in an organization and adaptation is to fit the present environment within an organization. The existing standards in an organization are combined with the ITIL framework on approaching the service management [3], [4]. An IT system management and functional operations are often found in ITSM [1]. The system management and functions have a high impact on the organization's service delivery. The IT services are aligned with organization's business requirements [1], [5]. The ITSM directly contributes to the success of IT services in an organization [3], [6], [7], [8], [9]. The ITIL framework is used worldwide by organizations to establish and improve capabilities in ITSM [3], [4]. The ITIL offers a best practice

for an organization to achieve a standard in IT service delivery and management [1]. It is important to note that an organization cannot become ITIL certified [1]. The people in an organization can become ITIL certified and implement the ITIL framework for ITSM in an organization [1].

In the library scenario, the IT service provider is the support team in the library. The support teams ensure the documented best practices for IT service management. IT is the steering group in maintaining and supporting the services in the library. The support team ensures the good practices of the entire IT facilities and processes including the activities, functions, roles and responsibilities that enable them to deliver the services. The support team in the library is also known as Single Point of Contact (SPOC) or helpdesk. The SPOC is between the support team and end-users or customers (patrons). The ITIL offers a blueprint for building a strategy for the IT Service Provider to understand and perform the tasks as best practices. The ITIL ball circle defines the life cycles and the tasks for the Service Provider. The ITIL ball circle is iterative [1]. Figure 1 illustrates the ITIL framework. The Service Provider needs to know the entire life cycle of the ITIL Ball Circle in order to deliver the value of services to the end-users (Librarians) and customers (Patrons). At each stage, the process delivered by the library is aligned with the service of information technology.

*Corresponding author: Zainab Ajab Mohideen

†Email: zainabajab@siswa.um.edu.my

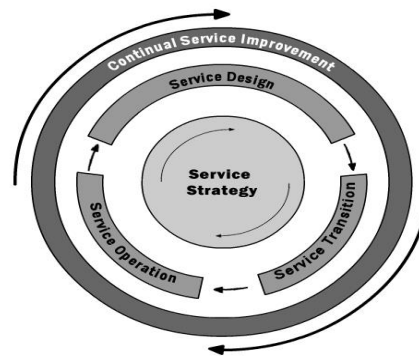


Fig. 1. ITIL v3 interactive ball

LITERATURE

The phrases ITIL and IT infrastructure Library are registered trademarks [1], [10]. The ITIL was developed in 1980 by The Office of Government Commerce [1]. The ITIL v3 is all about the Business Information Technology Alignment (BITA) [1], [11]. The present ITIL v3 is a more holistic perspective on the full life cycle of service, covering the IT organizations and all supporting components needed to deliver the value to the customers [1], [10]. The ITIL v3 underpins ISO/IEC 20000 [1]. The ITIL v3 consists of five core publications [1]. The publications are Service Strategy, Strategy Design, Service Transition, Service Operation and Continual Service Improvement [1]. ITIL 2011 has a major update on the framework which addresses errors and inconsistencies [1], [10]. In ITIL, there is a total of 26 processes and 4 functions [1]. Each process defines the goals, roles, functions, processes and delivers the value of services to end-users and customers. ITIL is the systematic approach to the high quality of IT services delivery. The ITIL delivers the services [10], [12]. Services are known to deliver the value to the customer by facilitating outcomes customers want to achieve without the ownership of the specific costs and risks [10], [12], [32].

The ITSM in an organization is the subset of the ITIL. In any organization which is related to IT, services are indirectly in the pool of a service framework of ITSM [13], [14], [15]. It is either the organization is aware or not of the existing framework which was created, adopted and implemented without the organization's acknowledgment. The existing IT services in an organization indicate the ITSM. The services which have been delivered to the users are actually the ITSM [14], [16]. Delivering and managing IT services is the actual term for the ITSM [10], [14]. The awareness of IT services and management in an organization will eventually make the organization realize where they are standing and heading in IT service delivery. The

ITIL is the best practice framework for ITSM [1]. Adopting the ITSM will help, guide and lead an organization to work more effectively in IT service delivery [13], [14], [15]. Over the years, IT practices have been the norm to an organization [13]. After all, it is just an IT service to customers. The value presented by the service has a high weightage for an organization [17]. ITIL is about the organizational structure and processes, effectiveness and efficiency of services and also cost effectiveness [1]. The ITIL and ITSM are about the organizational structure and processes [1].

The library operates within a dynamic environment which needs to adapt and improve performance while managing the services. The library's capabilities in handling the existing services and patrons' demands and expectations are under pressure and the services are used to benchmark the library's performance [18], [33]. The pressure and organization benchmark in the gap in the service capabilities [1], [19], [20]. The gap is filled with the adoption and implementation of best practices. The best practices are used to improve the ability to deliver quality services to the customers [21], [22]. In ITSM, the ITIL is widely recognized, trusted and best practice framework [1], [22], [23], [24]. There are several sources for ITSM practice which can fit the organization objectives and purpose. The ISO standards and industry practices are the famous resources. The ISO 9000, ISO 20000 and ISO 27001 are used to validate an IT practice [10], [17]. The industry practices are the ITIL, CobiT, PRINCE and Six Sigma - a set of guidelines used in IT-based industry [1], [10]. Services are means of delivering value to customers [19]. The statistic of a service is the intended result of an activity as in Table 1. Table 1 shows the demand in the library system usage for 4 years (2012-2015) which eventually guides the library to adopt and implement the ITIL framework. There is system maintenance and upgrade to meet patrons' needs on the system usage.

TABLE 1
DEMAND ON SYSTEM

System Usage				
Year	2012	2013	2014	2015
Month				
January	15 003	14 565	Sm/Su	67 530
February	12 452	9 253	Sm/Su	34 968
March	14 327	11 297	19 609	47 631
April	11 935	8 645	29 599	43 599
May	13 628	9 493	39 495	60 809
June	17 281	13 329	97 000	80 384
July	9 409	Sm/Su	14 328	23 943
August	7 849	Sm/Su	20 905	31 924
September	12 228	Sm/Su	32 486	56 295
October	13 336	Sm/Su	43 687	57 750
November	10 851	Sm/Su	51 307	44 719
December	11 655	Sm/Su	88 547	95 719

The IT governance ensures the policies and strategies are implemented and followed. The IT governance is a part of the corporate governance [3], [13], [25], [26]. The corporate governance is on behavior of directors while the IT governance ensures the organization’s IT sustains and extends the organization’s strategies and objectives [3], [13], [25], [26]. The IT governance includes defining roles, responsibilities, reporting and handling issues. The term governance and management are usually a misconception [1]. The governance is on maintaining proper policy and procedures to ensure the IT is doing the right things whereas the management is about doing things right [1]. The IT governance is in the role of doing more with less. This is to maximize the existing resources and create additional value to the present services [27]. The ITSM framework is used to manage the quality of IT services which meet the business requirements [4], [12]. The ITSM includes the IT service providers on the interconnection with people, process and information technology. The ITSM delivers high performance and value creation to an organization. A good relationship between IT service provider and customers relies on the customers receiving IT service at an acceptable level of IT performance, and at an affordable cost [3], [5], [8]. Three

main areas for the ITSM implementation is affordable cost, IT performance and relationship [1]. These lead to a service level agreement between IT service provider and the customer.

THEORETICAL FRAMEWORK

The ITSM governance is about applying the right process and procedures in a transparent, reliable, honored, sincere manner, and accompanied by appropriate documentation [13]; [26]. The ITSM framework shown in Figure 2 is for the implementation and management of quality IT services that meet the needs of business [1], [14]. The ITSM components are the People, Process and Information Technology [1], [14]. The system management is a set of specialized organizational capabilities for providing value to customers in the form of services. In this framework, the gap is in the data or information which is used to identify the differences. A set of data or information is being used by a service provider and also customers. The IT governance claims that there must be a policy, procedure, and transparency in the management of the usage and service delivery as shown in Figure 3. The ITSM highlights that there must be people, process and information technology in the usage and service delivery [1], [14].

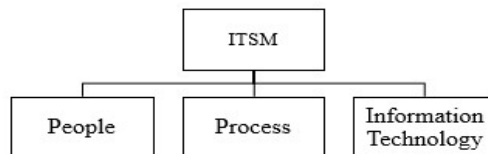


Fig. 2. ITSM framework

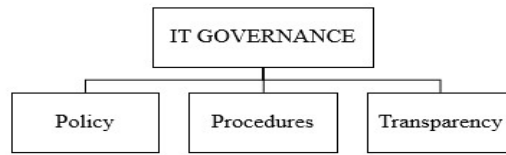


Fig. 3. IT governance framework

ITIL for Academic Libraries in Public Sector

This study presents the existing ITIL framework in a University library. This framework exists when there are IT service management and delivery in the library. In ITSM, the organization structure is important to determine the functions and role of an organization [24], [28]. The ITSM concept refers to people and automated measure that execute a defined process, an activity or combination of processes and activities [24]. Figure 4 illustrates the ITIL Organizational Structure and the interaction between the Service Provider, End-Users and Customers in the library [1], [24]. The organizational structure is very important in order to deliver IT services representing the

best practices [21], [22]. There are 3 main components in the structure - the service provider, end-users and customers. It is important in ITIL to give the exact definition of these terms. The service provider is referred to as an organization which supplies the IT services to one or more internal or external customers. The service provider is known as IT service provider in ITIL. There are 3 types of service providers [1]. Type one service provider is the internal service provider who is embedded within the organization. Type two service provider is who shares the IT services to one or more organizations and type three service provider is one who provides IT services to external customers. In a university library, the service provider is the type one.

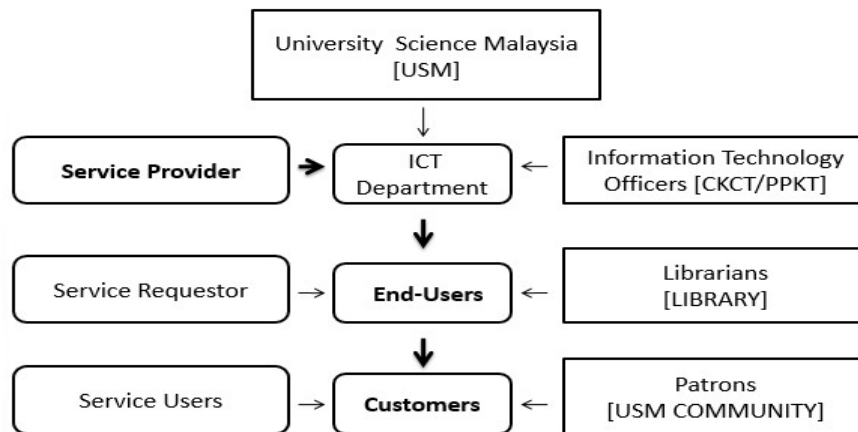


Fig. 4. ITIL organization structure in USM library

The Service Provider refers to the Information Communication Technology (ICT) Department that provides the ICT services. End-Users are the department or people who use the services on a daily basis. People refers to the internal department staff. Customers are the people/patrons within USM community. Practically Information Technology (I.T.) and Business do not understand each other. Hence, ITIL as the best practice framework is used for end to end services, non-proprietary (not tied to any vendor solution) and industry specific for I.T. and business [21], [22]. Figure 5 illustrates the ITIL Organizational Structure - Service Requestor flow and the interaction between

the Service Provider (CKCT/PPKT), End-Users (Digitization Division / Librarian) and Customers (Patrons). The communication flows down from Service Provider to Service Requestor in the library. The Digitization Division is led by a Librarian and an I.T. Officer. The ICT requirements are handled by the I.T. Officers whereas the library requirements are handled by the librarians. In this scenario, the services in the Library are known as Business. In ITIL, in terms of Library Services or Business requirements, I.T. has got “NO SAY” and the library does everything [1], [24]. IT Service is relevant in the Library as it will be carried out for a long period of time.

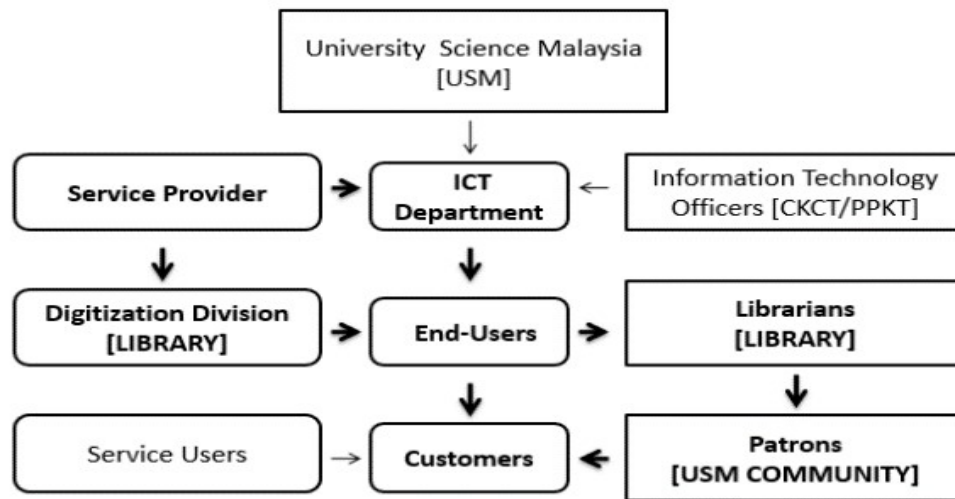


Fig. 5. ITIL organization service structure requestor

The discussion of IT service management and delivery in the library is based on the implemented ITIL framework as in figure 4. The discussion will include the interactive ITIL ball for the library IT service management and delivery. There are 5 main elements to be discussed for IT service management and delivery from the interactive ITIL framework which are the service strategy, service design, service transition, service operation and continual service improvement [3], [13], [14], [25].

Service Strategy

In this phase, the process of defining objectives, goals, processes and strategies of an organization (library) is being done. There are 5 strategies which are the demand management, strategy management, financial management, business relationship management and service portfolio management [1]. The Demand Management (DM) is a process that assists the I.T. Service Provider in understanding and influencing patrons' demand for services. The DM is closely related to Pattern of Business Activity (PBA) of the library. The library will have to document the PBA Profile which consists of Classification, Attributes, Requirements and Service asset requirements [24]. The PBA indicates the entire library demand and the support services to the Patrons. The strategy management is a process of looking at the long-term vision or services provided by the library in terms of ICT and other peripherals including databases. The chosen path and the forecast by the library will improve the Quality of Services (QoS) in the long run. The financial management is a process applied to the entire life cycle. The financial management is actually identifying the balance between the cost and quality of services. It also balances up supply

and demand between the I.T Service Provider and Patrons. The library will have to commit only the services that will be provided by the Service Provider. The business relationship management is a process of establishing and maintaining the business relationship between the Service Provider and Patrons based on understanding the services needed [24]. The outcome is to achieve a high level of Patrons satisfaction and to indicate that the Service Provider has met the Patrons requirements. The service portfolio management is a process that creates and maintains services according to library's need.

Service Design

In this phase the process of designing the services, processes and component (infrastructure) of an organization (library) is done. There are 8 types of service designs in the ITIL interactive ball which is the design coordination, service level management, service catalog management, supplier management, availability management, capacity management, information security management and information technology service continuity management [1]. The design coordination is a single point of coordination and control for all activities, the process in Service Design Pack (SDP). The library will produce the SDP based on service charters and change request, ensure appropriate SD and all services model. The Service Level Management (SLM) is the service at agreed level. The SLM is the actual performance report of the entire services by the library. The actual performance report is also known as Service Performance Achievement. There are four main documents or agreements in SLM. The agreement is divided into two categories as in figure 6.

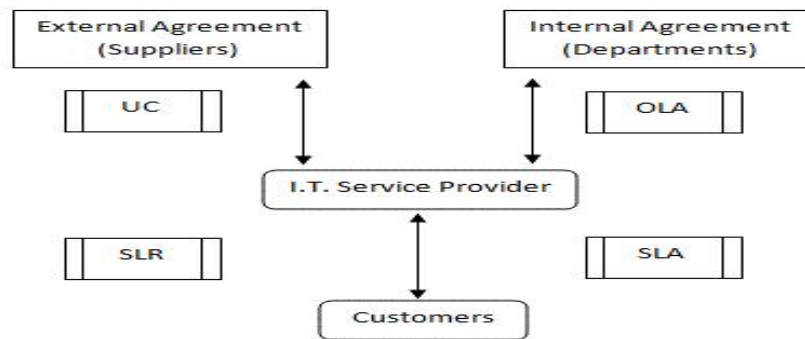


Fig. 6. Service level management-agreement

The first category is the internal agreement. The internal agreement is known as within department. The agreement includes the Service Level Agreement (SLA) and the Operational Level Agreement (OLA). The SLA is for department level. This agreement is signed between the Library (Digitization) and Customer (I.T. Service Provider). In this agreement, there is no legal terminology, performance and target-oriented and agreed upon by two entities. This agreement is reviewed regularly. The OLA is the agreement which is signed between the I.T. Service Provider and Library (Digitization). In this agreement, changes are allowed. The second category is the external agreement. The External Agreement also is known as suppliers. The agreement includes the Underpinning Contract (UC) and Service Level Agreement (SLA). The UC is an agreement which is signed between I.T. Service Provider and Vendor. Legal actions and rules are included in the UC. The SLR agreement is a template used to capture the document in order to produce SLA. The process of reviewing SLR depends on the needs and requirements. The most important agreement is the SLA. There are three types of SLA which are the service-based known as Best Effort [24]; it is for one service to all customers, customer-based for one customer to all services and multi-level SLA. The service catalog management is a part of a portfolio [1]. It consists of current services and all approved services. The main purpose of SCM is to manage information in the library.

The Supplier Management (SM) is actually determining the value for money in the library. The SM is the supplier policy and aligned with SLA. The SM is reviewed by the library regularly. The risk and impact analysis is mentioned in SM. The Warranty Processes (WP) are based on the availability management, capacity management, information security management and information technology service continuity management. The availability management is a process of optimizing the capabilities, delivering the cost effectiveness, sustaining the level of availability and also enabling the library to satisfy its

objectives. The capacity management is a process of identifying the current and future capacity for the library. The purpose is to justify the cost for the entire library. The Information Security Management is a process that aligns with I.T. Security, library security and the Information owned by the library. The purpose is to ensure that Information Security is effectively managed in all services and Information Technology Security Management (ITSM) activities. The ISM protects the information in terms of failure and inaccessibility. The Information Technology Service Continuity Management is actually the library Information disaster recovery. The library will have to perform the risk assessment and risk management in the ITSCM. In this level, the library will have to identify the most important service which leads to the key input to the library strategy.

Service Transition

In this phase, the information changes and controls the risk of deployment. The concept in ST builds, tests and deploys. There are 5 service transitions in the ITIL interactive ball for IT service management and service delivery which are the knowledge management, change management, service asset and configuration management, release and deploy management and the transition planning and support [1]. The knowledge management is a process or system for a better decision making.

There are two types of system which is the Data Information Knowledge Wisdom (DIKW) and Service Knowledge Management System (SKMS). This system helps library for a better decision making for the entire services available in the library. The Change Management (CM) is a process of improvement. The entire request for the change in the management and also the present management is controlled by the CM process. A documentation that keeps track of the CM is kept for addition, modification and removal of change in the library. The service asset & configuration management is a process that gives information on what are the Configuration Item (CI) and

Assets. The CI is the combination of a system and database. The system is known as Configuration Management System (CMS) and Configuration Management Database (CMDB).

The Configuration actually refers to hardware and software in the library. Both the systems support the entire library services in terms of information delivery to the patrons. The release and deployment management is a process meeting the end-users face-to-face. The patrons are met to get the output and enhance the entire library services.

Service Operation

In this phase, the process of reporting on operational data and design data is done and compared. The Service Operation (SO) is the actual day-to-day delivery basis of the entire service that is delivered at an agreed level to the patrons. There are 5 processes and 4 functions in the service operations [1]. The processes and operations are used to determine the type of IT service support and IT service delivery.

The processes are the event management, access management, incident management, problem management and request fulfillment.

The Event Management (EM) is the first process known as an entry point for all the other processes in SO. The EM monitors and controls the necessary facets of all I.T. infrastructures [29], [30]. The EM detects all changes in the services and delivers the actual operating performance. It monitors and controls and also inputs to all the other processes in SO.

Second is the Access Management (AM), a process to grant authority and rights to the patrons. This AM is to prevent accessibility to non-authorized information and services. The information and services are based on confidentiality, integrity and availability [31] from the library.

Third is the Incident Management (IM), a process to restore the normal service operation as quickly as possible, reduce the impact of downtime and maintain the quality and availability of the services. The IM is handled by the digitization division in the library. The main purpose of IM is to maintain the users' satisfaction level.

Fourth is the Problem Management (PM), a process to reduce the adverse impact on services of the incident and problems [31]. It is actually to prevent the problem from reoccurring and also eliminate the recurring incident. Two main concepts implemented in the PM is the temporary fix known as temporary resolution (Known Error) and temporary Overcome (Workaround). The important roles in PM are the Problem Manager and Technical Support group or Suppliers. Fifth is the request fulfillment to monitor and fulfill the Patron request on the services. The request is for the information, guidance and accessibility [11], [31]. The important role in RF is the service

desk, library staff, and external suppliers. Each role has its own request to be fulfilled.

The functions are the I.T. operation management, technical management, application management and service desk. The first function is the I.T. Operation Management (ITOM) which is to control the day-to-day management services and information and also facilitate the library infrastructures or facilities [29], [30].

The ITOM is also known as first line support. The support in the library is from Digitization Unit and I.T. Service Provider in the library. Secondly is the technical management function which is related to the entire hardware in the library. It mainly refers to the I.T. Infrastructures in the library. The support is the long term planning and usage of the hardware in the library. The services are support by the I.T. Service Provider and Digitization unit in the library.

Third is the application management function which is related to the entire application in the library. Whether the library purchases the system or builds it and the level of support to deliver the application services to the Patrons determine the AM throughout the library services. The application management technically refers to the software in the library which delivers the services and the expertise owned by the I.T. support staff in the library. Finally is the service desk function as the first level support to the library by the I.T. Service Provider. The SD is handled by non-technical staff in the library. The information and support delivered must be at their fingertips. The staff must be well-trained and good in communication skills. The SD is on a daily basis and the main purpose is to restore the normal services as quickly as possible [31].

Continual Service Operation

The Continual Service Operation (CSI) is a process applied at all the stages of the life cycle. The CSI happens at the entire three levels of management which is the Strategic, Tactical, and Operation (STO). The STO is set to be aligned with the library services in order to meet the Patrons' need at agreed level [1], [11]. The CSI must keep ongoing and sustained for a very long period of time. The Improvement in the service must be gradual, slowly and steadily managed. The CSI must be able to increase the users' satisfaction and bring value to the patrons, cost justifiable and also increase the quality of services [11]. The CSI is the opportunity and room for improvement and a registered log book.

CONCLUSION AND RECOMMENDATIONS

The ITIL is the best practice for service effectiveness and efficiency provided by the library. The statistics indicate the demand for systems are increasing as the information technol-

ogy influences library services. The adoption of ITIL requires the ITIL Certified Information Technology Officer to assist the library and service provider communities in shifting to a new paradigm. ITIL defines the roles and responsibilities of who is supposed to do what and what to do. The library is the service provider and very keen towards services thus the value of patrons, outcomes, costs and risks are high priorities. ITIL

for Malaysian Academic Libraries is by having the right process at the right place and a turnaround for conventional methods for service management and delivery.

Declaration of Conflicting Interests

This scholarly work has conflicts of interest.

REFERENCES

- [1] ITIL. (2011). *Foundation with case study (IV3-213 5.33) student Workbook* [Online]. Available: <https://goo.gl/n7XJwZ>
- [2] M. Ayat, M. Sharifi, S. Sahibudin and S. Ibrahim, "Adoption factors and implementation steps of ITSM in the target," in *Third Asia International Conference on Modelling & Simulation*, Bali, Indonesia, pp. 369-374, May 25-29, 2009.
- [3] G. Baioco, A. C. M. Costa, C. Z. Calvi and A. S. Garcia, "IT service management and governance modeling an ITSM configuration process: A foundational ontology approach," in *International Symposium on Integrated Network Management-Workshops*, pp. 24-33, June 1-5, 2009.
- [4] B. Barafort, V. Betry, S. Cortina, M. Picard, A. Renault, M. St-Jean and O. Valdes, *ITSM Process Assessment Supporting ITIL (TIPA)*. Zaltbommel, Netherlands: Van Haren, 2009.
- [5] F. Cervone, "ITIL: A framework for managing digital library services," *OCLC Systems & Services: International Digital Library Perspectives*, vol. 24, no. 2, pp. 87-90, 2008.
- [6] N. Ahmad and Z. M. Shamsudin, "Systematic approach to successful implementation of ITIL," *Procedia Computer Science*, vol. 17, pp. 237-244, 2013.
- [7] N. Ahmad, N. Tarek Amer, F. Qutaifan and A. Alhilali, "Technology adoption model and a road map to successful implementation of ITIL," *Journal of Enterprise Information Management*, vol. 26, no. 5, pp. 553-576, 2013.
- [8] A. Cater-Steel, M. Toleman and W. G. Tan, "Transforming IT service management-The ITIL impact," in *ACIS Proceedings*, Adelaide, Australia, Dec. 6-8, 2006.
- [9] N. Gama, M. do Mar Rosa and M. M. da Silva, "IT services reference catalog," in *International Symposium on Integrated Network Management*, Lisbon, Portugal, May, 8-12, pp. 764-767, 2013.
- [10] J. Iden and T. R. Eikebrokk, "Implementing IT service management: A systematic literature review," *International Journal of Information Management*, vol. 33, no. 3, pp. 512-523, 2013.
- [11] M. Marrone and L. M. Kolbe, "Uncovering ITIL claims: IT executives' perception on benefits and Business-IT alignment," *Information Systems and E-Business Management*, vol. 9, no. 3, pp. 363-380, 2011.
- [12] P. J. Brockwell and R. A. Davis, *ITSM: An Interactive Time series Modelling Package for the PC*. New York, NY: Springer Science & Business Media, 2012.
- [13] A. Nabiollahi and S. Bin Sahibuddin, "Considering service strategy in ITIL V3 as a framework for IT governance," in *International Symposium on Information Technology*, Kuala Lumpur, Malaysia, Aug. 26-28, pp. 1-6, 2008.
- [14] M. Ayat, M. Sharifi, S. Sahibudin and S. Ibrahim, "Adoption factors and implementation steps of ITSM in the target," in *Third Asia International Conference on Modelling & Simulation*, Bali, Indonesia, pp. 369-374, May 25-29, 2009.
- [15] R. Sharma, V. Madireddy, V. Jain and S. R. Apoorva, "Best practices for communication between client and vendor in IT outsourcing projects," *Journal of Information, Information Technology, and Organizations*, vol. 3, pp. 61-93, 2008.
- [16] K. Kanapathy and K. I. Khan, "Assessing the relationship between ITIL implementation progress and firm size: Evidence from Malaysia," *International Journal of Business and Management*, vol. 7, no. 2, pp. 194-199, 2012.
- [17] L. Hendriks and M. Carr, "ITIL: Best practice in IT service management," *The Guide to IT Service Management*, vol. 1, pp. 131-150, 2002.
- [18] Z. A. Mohideen and K. Kaur, "Digital library: Demands and expectations," in *4th International Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLIS)*, Noida, India, pp. 17-21, Jan. 06-08, 2015.
- [19] C. Keisch, D. Pondman, G. Kemmerling and J. Van Bon, *IT Service Management. An Introduction*. Zaltbommel, Netherlands: Van Haren Publishing, 2002.

- [20] A. Tanovic, I. Androulidakis and F. Orucevic, "Advantages of the new ITIL V3 model in the implementation of the IMS system," in *11th WSEAS International Conference on Applications of Computer Engineering (ACE12)*, Athens, Greece, pp. 183-191, March 07-09, 2012.
- [21] B. D. Goodman and S. N. Goldman, "Freeing creativity by understanding the role of best practices," in *IEEE International Conference on Engineering Management*, Hyatt Lost Pines, TX, pp. 308-311, July 29- Aug. 01, 2007.
- [22] S. Graupner, H. R. Motahari-Nezhad, S. Singhal and S. Basu, "Making processes from best practice frameworks actionable," in *Enterprise Distributed Object Computing Conference Workshops*, Auckland, New Zealand, pp. 25-34, Sep. 01-04, 2009.
- [23] J. Jarvelainen, "IT incidents and business impacts: Validating a framework for continuity management in information systems," *International Journal of Information Management*, vol. 33, no. 3, pp. 583-590, 2013.
- [24] H. Marquis, "ITIL: What it is and what it isn't," *Business Communications Review*, vol. 36, no. 12, pp. 49-52, 2006.
- [25] S. De Haes and W. Van Grembergen, "IT governance and its mechanisms," *Information Systems Control Journal*, vol. 1, pp. 27-33, 2004.
- [26] J. N. Rosenau, "Governance in the twenty-first century," *Global Governance*, vol. 1, no. 1, pp. 13-43, 1995.
- [27] M. C. Valiente, E. Garcia-Barriocanal and M. A. Sicilia, "Applying an ontology approach to IT service management for business-IT integration," *Knowledge-Based Systems*, vol. 28, pp. 76-87, 2012.
- [28] S. Graupner, S. Basu and S. Singhal, "Collaboration environment for ITIL," in *International Symposium on Integrated Network Management-Workshops*, pp. 44-47, June 1-5, 2009.
- [29] R. Esteves and P. Alves, "Implementation of an information technology infrastructure library process-The resistance to change," *Procedia Technology*, vol. 9, pp. 505-510, 2013.
- [30] R. Ramirez, N. Melville and E. Lawler, "Information technology infrastructure, organizational process redesign, and business value: An empirical analysis," *Decision Support Systems*, vol. 49, no. 4, pp. 417-429, 2010.
- [31] B. McNaughton, P. Ray and L. Lewis, "Designing an evaluation framework for IT service management," *Information & Management*, vol. 47, no. 4, pp. 219-225, 2010.
- [32] C. L. S. Tablatin, F. F. Patacsil and P. V. Cenas, "Design and development of an information technology fundamentals multimedia courseware for dynamic learning environment," *Journal of Advances in Technology and Engineering Studies*, vol. 2, no. 5, pp. 202-210, 2016.
- [33] F. B. Abdul Rauf, T. W. Hoe, and K. B. Samsudin, "A framework of educational augmented reality app for improving preschoolers creative thinking," *International Journal of Technology and Engineering Studies*, vol. 1, no. 2, pp. 31-41, 2015.

— This article does not have any appendix. —