Global Scientific JOURNALS

GSJ: Volume 8, Issue 9, September 2020, Online: ISSN 2320-9186
www.globalscientificjournal.com

ICT GOVERNANCE FOR SMALL MEDIUM ENTERPRISES (SMEs)

Ken Lim Kim Son[1][2017-2020]

[1] AeU, Malaysia, MMU, Malaysia

kennpc@outlook.com

Faculty of School Of Information & Communication, AeU Malaysia (2017)
Prof. Dr. Roshayu, roshayu.mohamad@aeu.edu.my
Mr. Ahmad Marzuki Ishak, esmi.marzuki@aeu.edu.my
Faculty Information Science and Technology, MMU Malaysia (2020)
Assoc. Prof. Ts. Dr. Md Shohel Sayeed, shohel.sayeed@mmu.edu.my
Dr. Nazrul, nazrul.muhaimin@mmu.edu.my

Abstract.

ICT is one of the fastest industries in the globe, the emerging and technology trends provide opportunities for the company for business systems and application management together with the control and security measurement. The emerging trends can be online service and online application, social media, cloud computing, bring your own device (BYOD) and etc. The ICT for business systems and applications management can be project management, software development, design, integration, process and analysis, requirements for system scoping, testing and implementation. The ICT services involve a company's IT infrastructure, capacity management, virtualization, networking, IT asset management, system design and development as well as communication together with the data and disaster recovery, backup contingency plans, redundancy and replication for resiliency and business continuity (GWA 2016). The ICT control for better use of information to work for more efficiently and meet its desired tempo. ICT security means for information and data protection from unauthorized access and prevents data leakage.

Keywords: ICT Demand and Supply. Governance. Operation. Tactic. Strategy. ISO.

2

1 Introduction

The overall idea of how an ICT demand and supply are depending on an organization to facilitate and realize of its criticality of ICT functions that would impact the business performance and business continuity. For instance, products and services for IT demand for business ideas and opportunities and IT supply with an ability to work on its resources and budget constraints.

The business is relying on the technology for growth and ICT demand is expected to increase tremendously when more ICT professional are demanded to accommodate the business growth that moving toward emerging and technology trends. ICT requires certain skills, whether creativity or innovative sufficient for business transformation (Niall Murray 2016). Based on the employment projection, it projected up to 20% growth of ICT demand. (Industry Projection 2016) in various areas especially in big data management, cloud computing and cyber security sectors (People Bank 2016). The highly skilled ICT professionals together with the IT changes and disruptions needs in an organization is expected with the competency of the ICT professional consists of their skills including technical and personal skills that complements the functions of ICT requirements. The planning and management in ICT for developments in technology and value chains together the IT lifecycle of an organization to change and to meet the technology trends. This has enabled growth and success of various application developers and solution integration providers to provide highly skilled professional to empower the end-user in a relevant technology development.

The framework in of Information Technology Infrastructure Library (ITIL) is a good example of good practices to address the demand in an effective ICT management. It brings the company in a good understanding of ICT process and standardizes the supply, plans, delivery and support of IT services to their businesses (TechTarget 2016).

The delivery of ICT products and services can be challenging and complex due to the high maintenance cost and its lifecycle chain. Technology trends are fast moving, the rapid change of technology resulting technology obsolete within a short period of time, an organization needs to focus more on the supply management to identifying the supply chains, data protection, integrity and smooth services with low budgets. The performance of the product and service must be measured in its quantitative including availability, response time and its continuity.

ICT demand and supply for an organization is a communication channel that can be structured and staffed by collaboration and support from all parties to meet the business objective. To start with the ICT demand and supply, an organization to identify products and services by evaluating its functionality and its lifecycle with improvement along the way by relying on the internal strength or an external source to improve it and certify it. The consideration of it functionality including research, plan, design, write, test, consulting and information technology system needs, hardware, software and applications to ensure that process orientation and task orientation meeting the condition of process effectiveness and achieve the control perspective for service delivery.

3

2 ICT Frameworks and Processes

The ICT frameworks and processes can be structured in the following: -

Planning to identify and define the ICT strategy including products and services following by managing its Service Level Agreement (SLA) at operational levels. Planning must include IT development that aligns with business plans and functions with architecture and application design for technology observation to achieve innovation and sustainable development target. E.g. resources that responsible for strategy and execution work with regard to the ICT support

Build & manage for ICT integration including system engineering, staging and testing of solution deployment to ensure service delivery, change support and incident management to detailed of all activities into documentation. Setting up information strategy to establish chain development, technology development, information and portfolio management and establish good processes.

Management in ICT strategy including security development, quality development, engagement with all levels, training, procurement, risk, process, business change and IT. The management is to ensure the facilities are available to users, business data management, operational supplier management and functional management in information specification and transition.

There are several factors that an organization needs to take into consideration when it comes to a decision for the ICT requirement for service delivery improvement such as the source and how to manage the risk of the supply. The ICT supply can be identified based on the product and service's capability and its capacity together with an adequate information through a thorough analysis of technology and environment factors before delegate people and process to a provision so to supports an organization's operation with sufficient storage, information and messaging management and security measurement for data protection. The critical success factor in the ICT supply can be measured based on the scope, quality and delivery, certainly involvement of risk assessment and mitigation during the planning phase. As part of the responsibility of ICT procurement, the company needs to measure it market capability and advise the sourcing model for the performance impacts, risks and dependencies for the growth. The company must frequently include ICT requirement in the board's agenda and discussed predominantly at the board level on the alignment of ICT strategy integration to business strategy to effectively and staffed the ICT functions.

To effectively staffed the ICT functions at the operational, tactical and strategic level depends on organizational controls that involve insight into the business operation and improve ICT processes for business. The ICT governance which also part of the ICT control helps to develop some foresight business objectives against the ICT strategy and performance, tactics and operations. It addressed a benchmark of ICT demand and supply for the company toward a positive level of business service, operation and

4

management. E.g. Control ICT for effective innovation, comply with legislation quickly and efficient ICT planning. It could be a challenging activity where it requires management involvement, information gathering, and observation of operational improvement but it gave direction to align with the objective of ICT demand and supply which results in whether in short term or long term for company's interests including minimal costs and efficiencies in business aspect, steps required for business improvement.

The framework of ICT demand and supply of operational, tactical and strategical explains briefly in the followings: -

Operationally – influence in core service in a business including the supply platforms, information and service management, information security, information exchange and collaboration services. How business data management influence operationally in both user management and functional management are the elements an organization needs to define for change and support in information specification requirements in preparing transition and develop an automated information system, support incident for problems, user communication, availability management and data management. The operation involves processes in impact analysis, design activity to decide on the required functionality, realize of change follow by testing the function that leading to function acceptably before the production implementation.

Tactically – how practical in ICT research and development, concepts, exercise and operation based on the ICT functions to meet the return on investment (ROI) and total cost of ownership (TCO). It involves planning and control based on the strategy for business information management annually that includes priorities information planning activities and the costs to execute to ensure responsibility for the project orientation and continuous activities; financial management including cost control for execution and monitoring of the cost assignment for information system and the procured to the relevant services; quality management to review the ICT facilities that meeting quality for the operation maintenance, quality and user satisfaction; control management to provision of information and ICT service requirements before making adjustment to the product and service to meet the satisfaction of the people who use it.

Strategically – to source and implement ICT functions effectively via tools, templates and good practices with detailed plans, scope, cost, time and resources and a proper documentation. The strategic in the ICT framework must meet the discipline in management with ICT governance in all ICT aspects. The monitoring, compliance and ICT management for efficient and effective use of ICT resources to meet the control, guideline, policies and procedures on the usage of ICT and to ensure that the usage being utilized ethically and consistently.

ICT demand and support must be aligned with a dynamic technology and business environment together with governance, agility, business informs, application and operation control, demarcation and source of service level to meet an organization's business improvement and continuity.

5

3 Certification entails with ICT

Certification is a recognition of products and services, an object, person and organization that meeting certain standard and able to demonstrate a good and reputable in deliver of products and services to the people. Certification provides independent verification of certain levels of expertise in a particular area, e.g. ISO9001 a title of a document that outlines the requirements an organization must maintain quality management system.

International Organization for Standardization (ISO) consisting of product, process and management standards aims to develop worldwide standardization by promoting adoption of an international quality standard for an organization to consistently meet the requirements that are set out in product and process standards. Why an organization chooses to do this is because international standards are the central cohesive source of support of our society, ensuring the safety and quality of products and services, facilitating international trade and improving the environment. Some organization chosen to do this because companies desire in gaining trust, gaining market share, comply with uniform and rigorous industry standard of best practices and pass a company backup verification. The standard shows the core principles account documentation, a chain of title, consumer feedback, complaint and dispute, a statute of limitation compliance, vendor management, credit bureau reporting, resale and other relevant operation procedures. Conformity to international standards helps to gain consumer satisfaction by ensuring the products and services safeness, reliability, good quality and environmentally friendly at the same time help businesses to control costs through system improvement and processes when the standard is met.

The certification can happen through an ISO standard structure which is also in processes and approach concept. A process approach to understanding and organizing company's resources and activities for operational optimization (Overman & Associates 2016). System approach to help management to determine interaction and sequence of processes when manage them as a system to meet customer satisfaction (Overman & Associates 2016) so as to achieve the desired result more efficiently. To improve processes and its effectiveness, it is recommended to use the Plan-Do-Check-Act (PDCA) cycle process. Plan to define and built up quality standard processes, Do by executing the plan, Check by setup measurements to identify compliances with the plan and Act by constant improvement of product and service performance to meet customer expectation.

Various types of certification are possible, giving examples for ISO27001, if the company to comply with various regulations, e.g. control and governance and data protection then ISO27001 to help in meeting requirements for security compliance that enables the company to do it in an efficient way. Not only that, ISO27001 is particularly good in differentiation, it enforces the company to identify the responsibility to strengthen the internal strength for precise decision in different aspects whether decision, or authority or information assets. The differentiation helps products and services in the current competitive market with a unique selling point to the consumers when

6

dealing with a customer's private and confidential information. Certainly, quality management system that improves company and product quality at all levels of processes in the entire company to meet the sales revenue stream and more business objectives

The standards element consists of quality management system, management responsibility, resource management and product realization, these are parts of rules and guidelines for specific technical specifications and criteria that may be part of the standard the company was chosen.

The implement of quality management system is company and top management decision and consideration for improvement in operation, strategy, employee and customer's expectation. ISO standards are being applied by companies for a result in aiming to improve the quality and profits and also customer requirements especially multinational company focused businesses. Not only that, required by regulatory for quality product, e.g. sensitive medical equipment; to gain market presence with a competitive advantage.

A brief summary of the key requirements is as follows: -

- **Quality Management System –** a process that ensuring of high quality and meeting customer requirements and expectation.
- **Management Responsibility** - Provide assurance to customers with a commitment. Define a vision and policy for all people stay informed.
- **Resource Management** - assign tasks to the right people with guidance and information sharing and collaboration, and interactive to create and maintain positive and harmony workspace.
- **Product Realization** - Clearly define the requirements and specification by understanding customers buying behavior, offer right product and design requirement, always align with product vendors and suppliers to ensure specification are followed.
- **Measurement, Analysis & Improvement** - Identify issues, risk assessment, continuous monitoring and measure customer satisfaction, an action for audit and compliance check, fix issues.

The company required to consider throughout the benefits and financial involvement when implementing ISO standard and obtaining ISO certification. ISO standards help transform the company's quality system to meet customer expectation. The company will enjoy its benefits such as good understanding and communicating to company's process, great culture and empower employee morale, improve operation consistency, focus management and staffs for efficiency, save cost. The Quality with improvement encourage for better financial returns, international quality recognition and create value for business opportunities. The costs of ISO implementation are quite substantial, the consideration to be taken in when implementing ISO including time, effort and cost to put in, but It can be offset by a better sales revenue, better productivity with reducing of defects and malfunction possibility.

7

The processes of certification using the Information Technology Infrastructure Library (ITIL) can be adopted for ICT operations. The ITIL is a methodology for managing IT as a service. It focuses on the users rather than on the technology. ITIL is frequently used as a method of preparation for achieving ISO20000 certification. ITIL method was formed based on the ISO20000 standard and the processes set up in corresponding to this method transiting to ITIL version 2 and then ITIL version 3. The ITIL structure can be established by measuring the achievement of processes and evaluation for improvement. Setting up of ITIL to establish the priority for customers and their satisfaction as well as the possibility in identifying the quality. ITIL version 3 views an operations organization from the products and services and lifecycle that delivered to customers. It was a phase for strategy determination, a phase of design, a phase of product and service in operation with improvement. The key benefits of ITIL are to increase staff retention, morale, support business change and continual improvement, enables flexibility in IT services whilst managing risk and to increase return on investment (ROI) and total cost of ownership (TCO) of IT and toward a transparent IT cost and assets.

Some example of certification is as follows: -

1. ISO 9001

The purpose of the certification is to satisfy customer requirement and meeting quality management system standards. It defines the rules and guideline for a quality management system to the company to provide assurance to the customer about the quality of their product and service. This certification requirement is applicable to all types of companies.

ISO 9001 defines the rules and guidelines for implementing a quality management system into organizations of any size or description. The standard includes process-oriented quality management standards that have a continuous improvement element. Strong emphasis is given to customer satisfaction. ISO 9001 registered companies can give their customer important assurances about the quality of their product and/or service (Chris Anderson 2016).

2. ISO20000

The standard for IT service management enables IT organizations to provide IT service management process aligns the needs of business and align with international standard. It helps the company to deliver managed services, identify performance to meet customer expectation and measure service. The certificate uses process-approach to continual improvement and its benefits the company to offer competitive differentiation by high quality and reliable services, assurance to customers that the service requirement is fulfilled, reduce the cost of conforming to the multitude of regulations, help leverage ITIL practices to optimize resources and processes.

8

3. ISO14001

The standard defines environmental management and good practices for global industries. The structure of ISO14001 is similar to the ISO9001 standard, it gives management a tool to control environmental aspects, improve performance and comply with the regulatory standard.

4. ISO/IEC27001

The standard is best known in the requirement for the information security management system (ISO Store 2016), it helps to manage the security of assets including financial information, intellectual property and customer details. The company can choose to implement ISO27001 to benefits the best practice and reassure customers the requirement is followed.

9

4 Review of ICT Governance & Improvement

It becomes imperative for IT Management personnel and those involved in ICT Governance improvement to have a good understanding of, and be able to deploy, suitable marketing and communication approaches to gain the trust and buy-in of stakeholders.

Critical to the success of ICT Governance initiative is an effective communication plan. The communication plan is based on a well-define influencing strategies.

These approaches although seem generic in nature may not fit any organizations. Every organization will have its own existing culture and choice of ICT Governance approaches.

Develop a presentation (diagrams and text) to explain the following:

a. Identify stakeholders' groups to be influence and their key messages.
b. Your choice of marketing and communication approach to gain stakeholders buy-in.
c. Explain the key communication messages you need to address.

4.1 Identify stakeholders' groups to be influence and their key messages

The key message of stakeholders to be influenced is the communication on the major objectives and IT Governance that brings values and benefits to the organization. Improper processes and lack of communication are the major causes of failures, with inadequate communication and a common understanding the requirements and issues.

Stakeholders Groups	**Key Messages**
Sponsor (Executive, CEO)	• Why IT Governance? To share benefits and objective of IT Governance initiative and successful delivery of the strategy and vision. • Launch IT Governance Project so to realize the benefits in return on investment (ROI) for shareholder value and leveraging the investment for better profits.
The management team (Executive, CFO, CIO, COO)	• IT Governance that brings ROI stakeholder value, decision and accountable for IT Governance that influence current and future capabilities to support business needs and company's growth. • To take ownership of IT Governance, share business and IT objectives and working towards company's goals for the investment in the IT Governance project, IT services and projects for efficient IT capabilities and cost-effective IT solution.

10

	• Support IT governance policy for long-term vision and contribution IT to the company's strategy. • Assurance of strategic alignment and contribution of IT Governance for value generation, information security, risk management, capital management and IT processes and performance. • Championship for IT Governance within an organization for an organization's IT management and governance. • Responsible to convinced that investment in IT management and Governance create value for the organization. • Awareness of IT related risks with IT Governance and control of IT activities. Transparency in IT decisions to reduce risks and failure on technology dependencies. Also to ensure IT complies with policy and align with relevant regulatory. • Advise on the IT costs and benefits, incorporate of governance requirement into the purchase process • Reducing the gap between the IT team, other teams and management for a common understanding of value delivery by technology, governance and control. • Intergrade governance principles into induction and performance appraisal measurements.
IT Manager / IT Governance Manager / Core team	• Direct reporting to CIO to the decision management for IT and business strategies and operational alignment • Work toward company's goals in IT Governance implementation. • Influencing strategy and IT Governance presentation to the CIO and the management. • Involving the business in IT decision for technical obstacle and encourage share responsibility for IT outcome with feedback and suggestion via satisfaction surveys to rectified IT problems that probably impact to the business operation. • Standardized processes and consistent approach on the initial governance and control framework. • Project team form, strengths and weaknesses analysis and identified and considered external case studies that impact IT Governance. • Define critical success factors, communication plan, with relevant work breakdown structure for a common understanding, forecast IT Governance project based on maturity assessments via control framework. • Manage risk, standardize processes with consistent approaches, comparison and recommend of external best practices, e.g CMMI, Cobit. • Profession in IT service delivery with performance improvement in risk mitigation, continuous efficiency and quality

	improvement, increase assurance in governance and control and effective IT measurements. • IT trend realization, Agility to response to the IT change that influence and improve business performance and continuity. IT balance business scorecard that influences and brings value to the company and sound management discipline and control are needed for IT complexity in the current fast changing and unique conditions. • Formulate sustainable approach for current and subsequent IT Governance projects. • Integrate existing and planned governance practices, support customer's governance approach. • Define plan and deliverable, undertake core tasks, process report and provide training and development to ensure adequate education and communication at all levels. • Communication of governance and control between users for them to understand business needs for improvement in alignment between IT and business.
IT Strategy Committee	• IT strategy on IT value, risk and performance for IT developments, alignment of IT with business direction and meeting IT objectives to the management. • Contribution of IT strategy to the business objectives including risk, return and competitive aspects of IT investments. • Progress on major IT projects and achievement of strategic IT objectives through effective IT resources, skills and infrastructure strengths or leverage on external advisors for IT governance guidance • Steering committee sign-of annual Governance plan, awareness of IT-related issues with support from the management board, recognize IT Governance like ITIL/ISACA brands iscomple the IT Governance solutions.
Internal stakeholders- team member, managers & internal customers	• Team members – clear understanding of responsibility and a pleasant working environment. • Managers – clear communication to the members, and help to complete projects, a model of good practices to teams, understand business decision and networking opportunities for long-term planning through an effective IT governance. • Customers – act in a professional way of conduct, clear understanding and consistent manner at all the time from a good reputable company.
External stakeholders – customers, industry experts &	Organization follow the good IT practices, framework, solution and governance and control focused mainly in

12

leaders, auditors, government, shareholders & investors, community, suppliers, agents and trade union	• Customers – meeting their needs of the goods and services that company/organization offers, buying decision via word-of-mouth that influence others. • Industry expert – influence positively about the company or its products and services when requested to do so. • Leaders – influence the buying decision and willing to try out the company's products and services • Auditors – coordination with governance strategy with assurance on the control over IT and performance management system. • Government – legislate to govern what the company can do and influence on the governance • Shareholders and investors– good governance influence them to continue to provide funds and invests for the company • Community – may have interest in its building with a good reputation of the company • Suppliers – influence willingness in resource and goods allocation. • Agents – a good reputable company with good IT governance that they represent • Trade union – recognize the company that contributed to the pay and working condition of employees.

4.2 Marketing and communication approach to gain stakeholders buy-in

The marketing and communication approach to gain stakeholders buy-in is important in ICT Governance. A full support from the management especially the key stakeholders is required to implement and execute the strategic plan with a great idea put into the plan. A majority of the work done through performance management focuses on employees can't supplant the key aspect of the governance strategy.

The key stakeholders are the people and groups who can influence and affect the decision of the governance strategy. Stakeholder management forms up of stakeholder engagement with different departments in the relevant department's/company objectives. Effective stakeholder management helps in interpreting the environment factors, responding and influencing the business decision. It enables a constant methodology by ensuring an appropriate response in particularly to the company's issues that consider or impact the stakeholder's interests.

The model of engaging with stakeholders (figure 1) can be done through annual conference, meeting, the global forum, projects, join planning and capacity and etc.

13

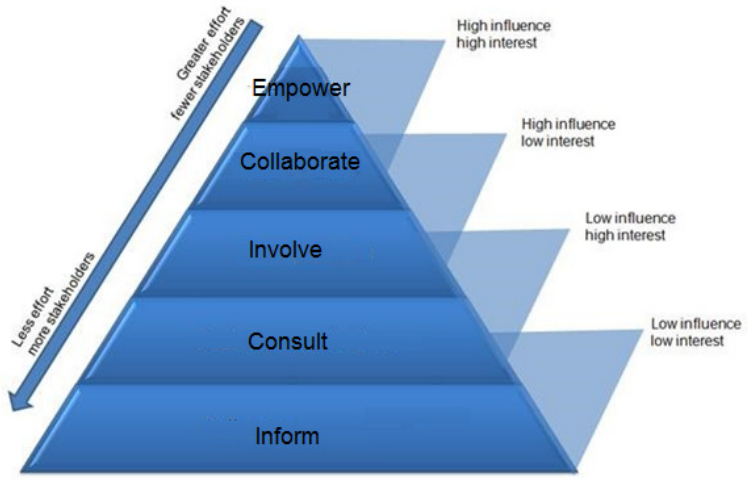


Figure 1: Stakeholders engagement model

Inform	Leverage on fact sheets, circulars, Newsletter to keep stakeholder informed so to provide balanced, objective, accurate with consistent information to help stakeholders to understand the problem, alternatives, opportunities and etc.
Consult	Leverage on public comment, surveys, websites to keep stakeholder informed, listen and knowledge to provide feedback and obtain feedback from stakeholder on analysis, alternatives to influenced on governance strategies outcome.
Involve	Leverage on the workshop, meeting and conference to work together to ensure stakeholder's concern and aspiration are directly reflected in the development and influenced the outcome. The objective is to work directly with stakeholders throughout the process to ensure that their concern and needs are constantly considered.
Collaborate	Leverage on tools, groups reference, simulate projects and facilitated a consensus building forum for decision-making for advice and innovation in formulating solution and incorporate the advice into the outcome to the maximum extent. The objective is to partner with the stakeholder including the development of alternatives and solutions, determine the preferred solutions with decisions.
Empower	Leverage on joint planning, provision of data, projects sharing, capacity planning even the governance to implement what have decided to support and complement the actions. The objective is to place a final decision making in the hand of the stakeholder. Stakeholders are encouraging to actively contribute to meeting the governance and control objectives and outcomes.

14

The following 3 perspectives to gain stakeholders buy in;

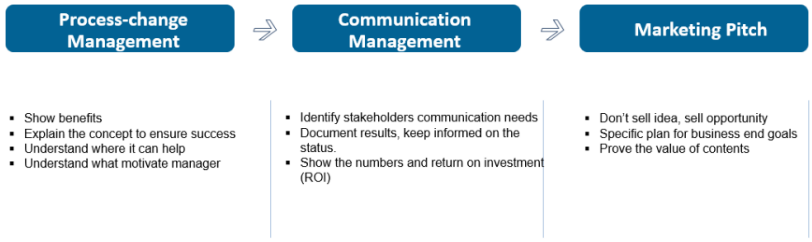


Figure 2: stakeholders buy in process (source: Todd Ballowe 2016).

Stakeholder management expose to some risks (figure 4) and challenges (figure 4) that would affect the engagement and communication process.

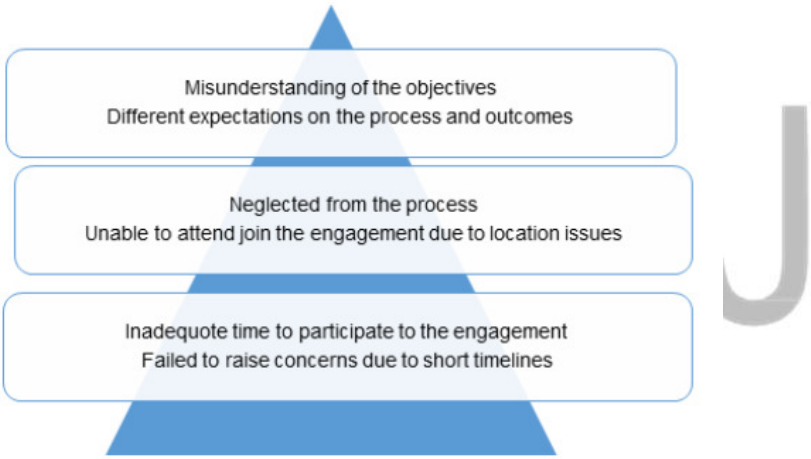


Figure 3: Common risk

15

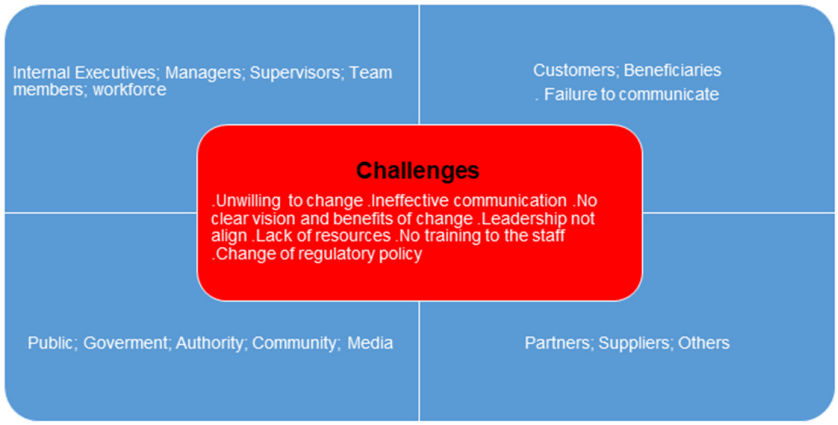
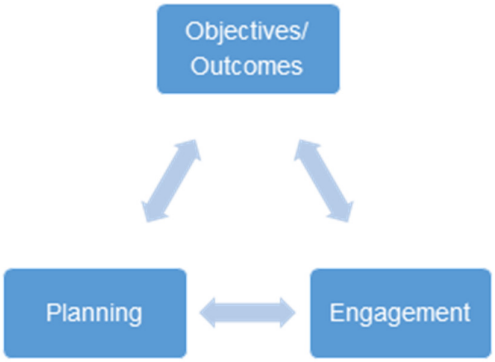


Figure 4: Challenges

Risks can be managed, stop or reduce and challenges can be managed and addressed through the strategic plans, here is the possible mitigation to address and minimize the potential risks and challenges.

a. Stakeholder engagement evaluation plan
b. Data collection – observation on attendance, timelines to meet the objective, obtain a benchmark for measurement, survey and questionnaires.



	Evaluation Questions	Evaluation Meth-ods	Evaluation Execution

16

Planning	• What planning process for the governance strategy? • What could have been improved differently upon the governance and control? • Was there sufficient budget and resource for the governance strategy planning? • Did we neglect any stakeholders?	• Fact sheets • Surveys • Forum • Meeting • Conference • Feedback sheets • Websites • Data collection • Interview • observation	• Conduct weekly meeting • Conduct monthly/quarterly conference • Conclusion of governance and control policies • Observation on the engagement process • Conduct one-to-one interview with stakeholders • Complete feedback sheet, survey, data collection on forum and websites • Collect and analyze data on number of stakeholders participated in the engagement activities
Engagement	• What are the engagement methodology? Will it work well? • What could have been improved by doing so? • Did we have sufficient budget and resources? • Were the stakeholders supportive throughout the engagement?		
Benefits/ Outcomes	• What was changed in governance and control policies? • How did commitment to the governance policy change? • How has the quality of services, projects improved? • How has the relationships with the stakeholder changed?		

4.3 Key communication messages

The key communication messages need to address are the implementation structures, processes and relational mechanisms in a company/organization in order to enable both business and IT professionals to execute their functions in support to business-IT

alignment and in the creation of business value within all IT-enabled business investments. The ability to direct and control the company or organization's use of information technology resources in line with its strategic goals.

A common understanding is required for effective communication. A two-way communication must be found between a business and IT for business performance and continuity. Business views the IT as a valued business function for communication among all stakeholders.

An effective communication can be established via the following workflow (figure 5) and processes (figure 6 & figure 7)

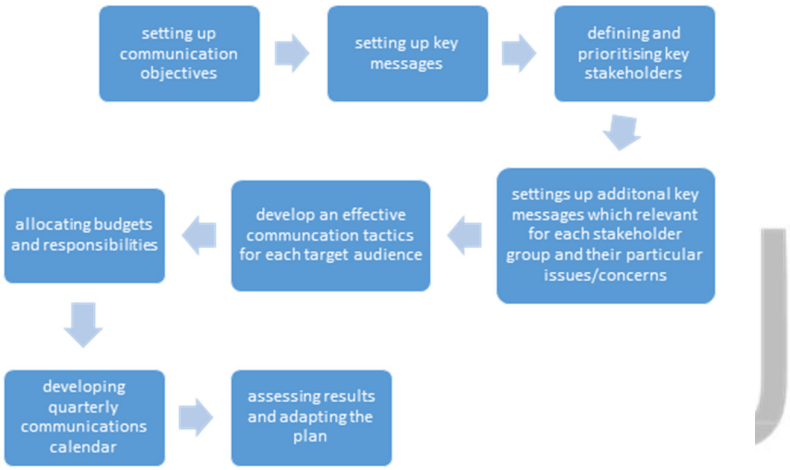


Figure 5: Effective communication workflow

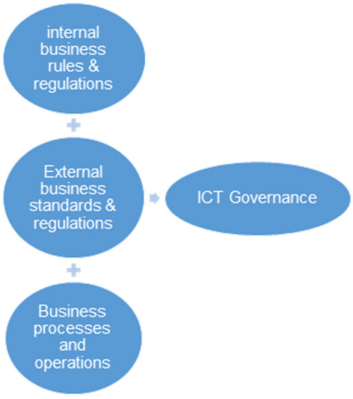


Figure 6: Key elements and communication to established ICT Governance

18

Internal business rules and regulations	The messages are to create rules and procedures to the operation aspects of the adoption of governance and control for effective management, appropriate controls on systems and processes, staff right and permission with the code of conduct to the standard set out by an organization to meet business performance criteria.
External business standards and regulations	The describes the roles and standard direction of business conduct to measures business requirement in the value of IT governance and control delivered by the organization to meet the external compliance, e.g. legal and regulatory requirements; gained trust from the suppliers; external audit requirements, etc.
Business processes and operations	To leverage on the governance and control for better communication and commercial effectiveness with best practice approaches in practical, advice and standards for business improvement and continuity.
ICT Governance	As per the diagram above, ICT Governance acts as the center pillar to standardizing business process and operations for performance and value and align IT with business strategy for business performance and revolution.

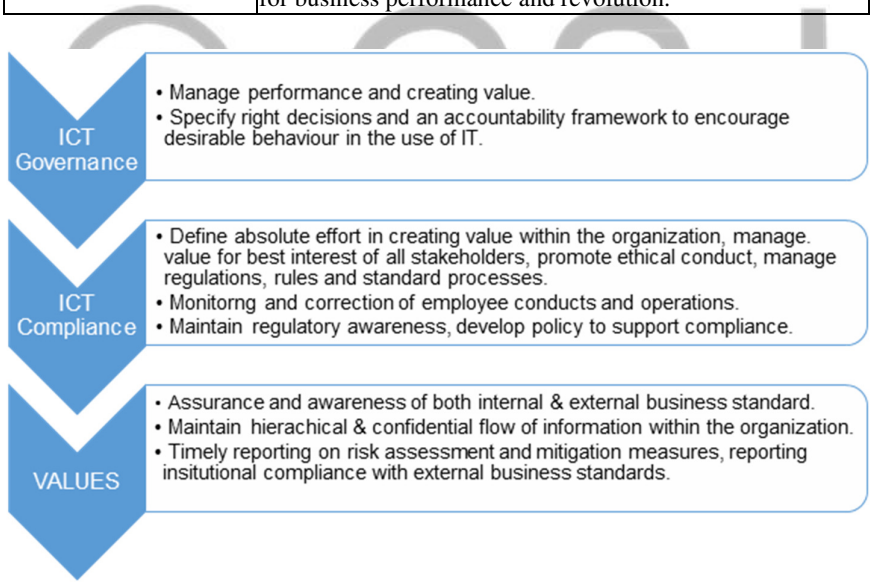


Figure 7: Key communication messages of ICT Governance, ICT Compliance and its values

19

5 Conclusion

There are growing threats to information security. Information sharing from public institution with a higher ICT governance maturity is encouraged. An effective and efficient management and decision-making achievement of the institution's objectives and the management of IT related risk is essential.

As a conclusion, the IT governance mechanism ensures all ICT needs, and objectives are meet. ICT governance also ensures a set of rules can be prioritized. As such, for compliance to be monitored to ensure of alignment of ICT direction and objectives. The process of ICT is evaluated, direct and monitor which the metric used to help the management to evaluate and monitor of IT related goals by providing direction based on the goals and evaluation metrics. Metrics gives enterprise a baseline that are useful for compliance and process effectiveness and measuring success against established positive ICT outcomes. The outcomes include the time taken, the people, resources and skills as part of the monitoring mechanisms for enterprise goals and objectives. Enterprises can use generic metrics that are provided by global standards and frameworks to define enterprise-specific metrics, which should be mapped to enterprise objectives and goals (Sunil Bakshi, 2020).

20

References

1. Ahmad Marzuki Ishak, AeU forum – Week2- Chapter 2 – IT Governance roles and
2. responsibilities, available at http://pls.aeu.edu.my/mod/forum/discuss.php?d=1971, accessed: 28 October 2016.
3. Boundless 2016. "Strategic, Tactical, and Operation Control" by Boundless Management 31 May 2016. Accessed from https://www.boundless.com/management/textbooks/boundless-management-textbook/control-8/types-of-control-62/strategic-tactical-and-operational-control-313-3960/
4. Burton. P., Wu, Y. & Prybutok, V 2010. Social Network Position and its relationship to performance of IT Professional. Pg. 2-17.
5. Chris Anderson 2016, What are 10 reasons why you need ISO 9001 certification? Available at https://www.bizmanualz.com/obtain-iso-certification/what-are-10-reasons-why-you-need-iso-9001-certification.html
6. Dejan Kosutic 2013, Four key benefits of ISO 27001 implementation, http://advisera.com/27001academy/knowledgebase/four-key-benefits-of-iso-27001-implementation/, accessed: 30 October 2016
7. Dan Gilmore 2007, The top 10 supply chain technologies and strategies for 2007. Available at http://www.scdigest.com/assets/FirstThoughts/07-01-25.cfm
8. Dillardm J, The big sky associate 2015. The data analysis process – 5 steps towards better decision making, 2, Pg. 1-18
9. Endeavor Management 2014, IT Governance – The role of the Board of Directors, retrieved: http://www.endeavormgmt.com/wp-content/uploads/2015/04/Information-Technology-Governance-The-Role-of-the-Board-of-Directors-.pdf, Pg. 2-6
10. GWA 2016, Government of Western Australia, Information and Communication Technology (ICT) – *Strategic Framework,* retrieved: https://www.dlgc.wa.gov.au/Publications/Pages/ICT-Strategic-Framework.aspx, Updated: 12 April 2016
11. Henderson K.J 2012. *Small Businesses- the disadvantages of IT in Business*, 30 April 2012.
12. Industry Project 2016, *Employment Projection, by Australian Government – department of Employment*, available at: http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections, 12 August 2016.
13. ISO Store 2016, ISO/IEC 27001 – Information security management, available at: http://www.iso.org/iso/home/standards/management-standards/iso27001.htm, accessed: 3 November r 2016.
14. IT Governance Institute, IT Governance Global Status Report 2008. Accessed: http://www.pwc.be/en/multimedia/it-governance-global-statut-report-pwc-08.pdf, Pg. 8- 55
15. Jason, 2016. 13 strategies to get buy-in for your great ideas [art of buy-in 3/3] http://www.jasonshen.com/2012/13-strategies-to-get-buy-in-for-your-great-ideas/. April 2016.
16. Jen Neibuhr & Stefan Stroh, PWC 2016, Strategy & IT Demand Management, available at http://www.strategyand.pwc.com/global/home/what_we_do/services/it/service-areas/world-class-it/display/it-demand-management
17. Mathew Magee, Petr Marounek, Lynn Muelle & Andrew Phillipson February 2008. IBM IT

18. Governance Approach – *Business Performance through IT Execution,* available at http://www.redbooks.ibm.com/redbooks/pdfs/sg247517.pdf, An introduction to governance Pg. 1-5, Governance vs Management Pg. 16-24, IT governance control strategies Pg. 53-59, Overview of the approach Pg. 87-90
19. Michael Gentle 2007, A New Model for IT Demand Management, available at http://www.cio.com/article/2437921/leadership-management/a-new-model-for-it-demand-management.html, 9 Oct 2007.
20. National Computing Centre, Oxford House London. Available at https://www.isaca.org/Certification/CGEIT-Certified-in-the-Governance-of-Enterprise-IT/Prepare-for-the-Exam/Study-Materials/Documents/Developing-a-Successful-Governance-Strategy.pdf. Pg. 4- 68.
21. Niall Murray, 2016. What Skills Do ICT Companies Need Most? Available at: http://www.collinsmcnicholas.ie/author/niall-murray/, 18 August 2016.
22. OECD 2015. Legal Affairs – Internal Rules and Regulations: Governance Structure & Code of Conduct. https://www.oecd.org/legal/internal-rules.htm, accessed: November 2016.
23. Overman & Associates, LLC. Quality & ISO explained, available at http://www.overmanassoc.com/quality_iso/process/index.php
24. People Bank 2016. 2016 Asia Forum on Cyber Security & Privacy: *Security and Privacy for Cloud Computing in the Digital Age*. http://apide.org/report-2016-asia-forum-on-cyber-security-privacy/, accessed: 5 November 2015.
25. Seek Learning 2015, Information and communication technology: Hot in 2015, https://www.seeklearning.com.au/study-and-career-advice/seek-job-trends/industries-that-are-hiring-in-2015/ict, Viewed: 30 October2016
26. http://www.landell.com.au/images/documents/Landell_ICT_Supply_Design_and_Sourcing.pdf
27. SlideShare 25 March 2016, *ICT Governance*, http://www.slideshare.net/SkypeID_virtualbraininc/ict-governance-60021724, Pg. 2-32
28. *Skills Panorama 2015, Analytical Highlights – ICT professional skills opportunities and challenges* at http://skillspanorama.cedefop.europa.eu/en/analytical_highligths/ict-professionals-skills-opportunities-and-challenges#_edn4.
29. *Sunil Bakshi, 2029. Performance measurement metrics for IT Governance. ISACA Journal/issues/2019/vol3/small business interruptions.*
30. Thomas J.Casey & Hnning Hagen, 2015 Technology Industry Trends – *Value & Innovation.* http://www.strategyand.pwc.com/perspectives/2015-technology-trends
31. Todd Balowe 2016. On Strategy -3 perspective for getting buy-in from management, at http://onstrategyhq.com/resources/3-perspectives-for-getting-buy-in-from-management/, accessed: 4 November 2016
32. Tom Harnish 2014, Convince Your Boss http://www.howtoconvinceyourboss.com/craft-your-pitch/, accessed: 5 November 2016
33. Tommy Doc, Effect of Technology on supply and demand curves, available at http://smallbusiness.chron.com/effects-technology-supply-demand-curves-30626.html published by Hearst Newspapers 2016.
34. UKEssays 2015, Strategic Operational and Tactical Level Information Technology Essay, https://www.ukessays.com/essays/information-technology/strategic-operational-and-tactical-level-information-technology-essay.php published: 23 March 2015.

22

35. Vaughan Merlyn 2012. The keys to IT Demand Management available at http://www.themerlyngroup.com/2012/08/27/the-keys-to-it-demand-management/, 27 August 2012., accessed: 15 November 2016
36. Xanthos, IT Governance Ltd 2003-2016, ISO/IEC 20000: The International Standard for Service Management at http://www.itgovernance.co.uk/iso20000.aspx, accessed: 30 October 2016