AN IMPROVEMENT OF NETWORK FACILITIES INSTALLATION PERMIT APPLICATION PROCESS AT SABAH STATE OFFICE MCMC

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A project report submitted in partial fulfillment of the requirements for the award of the degree of Master of Business Administration

International Business School
Universiti Teknologi Malaysia

JANUARY 2022

DEDICATION

To my beloved parents

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful.

All praise to Allah and His blessing for the completion of this research. I thank God for the opportunities, trials, and strength that have been bestowed upon me in order for me to complete this action research.

To begin, I would like to express my appreciation to my supervisor, Hj SLAE Zaiful Hasmi Bin Mohd Hashim for his guidance, thoughts, tolerance, continuous encouragement enabled me to successfully finish my action research project. Having him as my supervisor has been a pleasure and an honour.

I would like to convey my appreciation to Universiti Teknologi Malaysia (UTM) and my faculty, Azman Hashim International Business School, for allowing me to do action research as part of my Master of Business Administration degree and for assisting me with facilities and online resources.

I want to extend my sincere appreciation to the MCMC Sabah State Office Director, Tuan Izani Othman for his continuous support and understanding. Not to forget, special gratitude to all my MCMC Sabah State Office colleague for agreeing to participate in my action research. Their help and support in data collection, as well as their engagement and participation in the action research intervention.

Last but not least, I would like to thank my family and friends for their unending encouragement and support in pushing me to do my best, as well as for recognizing my efforts. May God grant the above-mentioned individuals success and honor in their lives.

ABSTRACT

This study focuses on improvement of Network Facilities Installation Permit (NFIP) application process at Sabah State Office MCMC. There are three objectives of the study; to identify the issues and challenges in the current, to implement intervention action to improve the existing process and to evaluate the impact of the intervention implemented in improving the Network Facilities Installation Permit (NFIP) application process in Sabah State Office. Two interview sessions were conducted involving one assistant director (executive level) and the other one was head of branch office (manager level). The data obtained from the interviews was analysed using thematic analysis manually. NFIP dashboard was developed using Microsoft Power BI as the cycle one intervention action. A set of questionnaires adopted from Technology Acceptance Model (TAM) is distributed to 17 respondents to assess the perceived ease of useful, perceived usefulness and intention to use the developed NFIP Dashboard during pre-intervention and post-intervention. The data obtained from the survey was analysed using SPSS for descriptive analysis, normality test, reliability test and t-test analysis. Based on the analysis result, there is significant difference between pre and post intervention of NFIP Dashboard as intervention action to improve NFIP application process in Sabah State Office. The intervention implemented in action research cycle one will be improved and will be measured again in the action research cycle two. The improvement of NFIP application process will eventually assist to expedite the rollout of telecommunication infrastructure in Sabah.

Keywords: Process improvement, office management, information system, process application

ABSTRAK

Kajian ini memberikan fokus kepada penambahbaikan di dalam proses permohonan Permit Pemasangan Kemudahan Rangkaian di Suruhanjaya Komunikasi dan Multimedia Malaysia, Pejabat Negeri Sabah. Terdapat tiga objektif kajian iaitu; untuk mengenal pasti masalah dan cabaran dalam proses sedia ada, untuk melaksanakan tindakan intervensi untuk memperbaiki proses yang sedia ada, dan untuk menilai kesan intervensi yang dilaksanakan dalam meningkatkan proses permohonan Permit Pemasangan Kemudahan Rangkaian (NFIP) di Pejabat Negeri Sabah. Dua sesi temu ramah dijalankan melibatkan seorang penolong pengarah (peringkat eksekutif) dan seorang lagi adalah ketua pejabat cawangan (peringkat pengurus). Data yang diperoleh dari temu bual dianalisis menggunakan analisis berdasarkan tema secara manual. Papan pemuka NFIP dikembangkan menggunakan Microsoft Power BI sebagai tindakan intervensi kitaran pertama. Satu set soal selidik yang mengguna pakai Technology Acceptance Model (TAM) diedarkan kepada 17 responden untuk menilai kemudahan yang dirasakan, kegunaan yang dirasakan dan niat untuk menggunakan NFIP Dashboard yang dikembangkan sebelum dan selepas pelaksanaanya. Data yang diperoleh dari tinjauan dianalisis menggunakan SPSS untuk analisis deskriptif, ujian normaliti, ujian kebolehpercayaan dan analisis ujian-t. Berdasarkan hasil analisis, terdapat perbezaan yang signifikan antara sebelum dan selepas pelakasanaan NFIP Dashboard sebagai tindakan intervensi untuk memperbaiki proses permohonan NFIP di Pejabat Negeri Sabah. Intervensi yang dilaksanakan dalam kitaran penyelidikan tindakan pertama akan diperbaiki dan akan diukur lagi dalam kitaran penyelidikan tindakan kedua. Peningkatan proses permohonan NFIP akhirnya akan membantu mempercepat pelaksanaan infrastruktur telekomunikasi di Sabah.

Kata Kunci: Penambahbaikan proses, pengurusan pejabat, sistem informasi, aplikasi proses

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LIST OF ABBREVIATIONS

MCMC	-	Malaysian Communications and Multimedia Commission
NFP	-	Network Facilities Provider
NFIP	-	Network Facilities Installation Permit
SBSO	-	Sabah State Office, MCMC
OSA	-	One Stop Agency
TIC	-	Tower Inspection Checklist
TAM	-	Technology Acceptance Model

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The discussion on this chapter consists of case company introduction, external and internal environmental analysis, SWOT analysis, problem diagnosis, theoretical and practical gaps, research questions, research objectives, researcher's role and ethics.

1.2 Case Company Introduction

Internet connectivity plays a vital role in our daily lives nowadays. As the technology is evolving rapidly, the internet connectivity is not only used to communicate between to individual from different places but cover almost all of our day-to-day activities from the minute we wake up in the morning until the time we return to bed at night.

Telecommunication infrastructure is the physical infrastructure that is responsible to connect the internet throughout the telecommunication network. The telecommunication infrastructure can be installed on the land surface such as three-legged tower, lattice tower, monopole, and rapid assembly pole. Apart from that, there are telecommunication infrastructures that is installed on existing building roof-top equipped with boom antenna.

In November 1998, Malaysia approved a convergence regulatory approach for the communications and multimedia industries. The Communications and Multimedia Act of 1998, which established a new regulatory licencing framework for the industry, and the Malaysian Communications and Multimedia Commission Act (1998), which established a new regulatory body, the Malaysian Communications and Multimedia Commission, were both enacted to give effect to the new regulatory model. The Telecommunications Act (1950) and the Broadcasting Act (1988) were repealed when the Communications and Multimedia Act (1998) was enacted on 1st April, 1999.

MCMC Sabah State Office (SBSO) is located in Menara MAA, Api-Api, Kota Kinabalu, Sabah and started its operation in 1st July 1999. There are three branch offices under the state office; Keningau Branch Office (KGUBO), Sandakan Branch Office (SKDBO), and Tawau Branch Office (TWUBO). Sabah State office main function is divided into two department; Development Department and Regulatory Department. Development Department oversee two units; Infrastructure Planning & Implementation Unit (IPIU) and Management, Services & Advocacy Unit (MSAU). Regulatory Department oversee another two units; Quality Monitoring & Assignment Unit (QMAU) and Regulatory & Compliance Unit (RCU). The organization chart for Sabah State Office is shown in Figure 1.1.

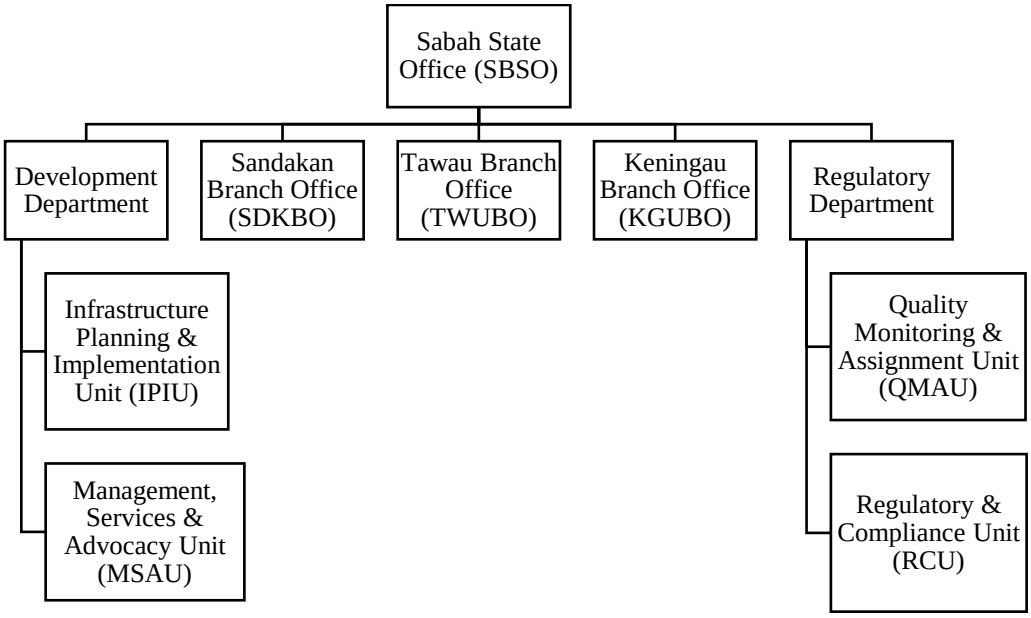

Figure 1.1: Sabah State Office Organization Chart

1.2.1 External Environmental Analysis

The external environmental analysis emphasizes on identifying and evaluating trends and events beyond the control of a single organization. The external environmental analysis for this study is evaluated based on PESTEL as shown in Table 1.1

Table 1.1: PESTEL Analysis

Factor	Opportunities	Threats
Political Direction of the organization is determined by the current government. Changing of government will affect the structure and operation of the organization.		✓
Economy Good economy condition increases the ability for the government to allocate more budget on infrastructure.	✓	
Social Most of the millennial are more tech savvy compared to baby boomers, gen-Y and gen-Z.	✓	
Technology Advance technology may reduce manual labour and repetitive works.	✓	
Environment Telecommunication device and equipment consists of lithium and microchip that is indisposable.		✓
Legal The source of power for MCMC comes from Communications and Multimedia Act 1998.	✓	

Based on the evaluation, there are four factors showing opportunity which are economy, social, technology and legal factor. Political and environment factor on the other hand is evaluated as threats.

1.2.2 Internal Environmental Analysis

There are four factors have been considered for internal environmental analysis related to the research topic. The evaluation of each factor is shown Table 1.2.

Table 1.2: Internal Environmental Analysis

Factor	Strengths	Weaknesses
Management Strong Management in Sabah State enables the staffs become independent and multitask.	✓	
Financial To apply for budget, proposal must be submitted to headquarters and the approval process is lengthy.		✓
Operation Due to tremendous workload at certain times, processing NFIP application has become low priority.		✓
Information System Staffs in Sabah State Office is digital literate	✓	

Management and Information system factor are evaluated as strengths but financial and operation factor are evaluated as weaknesses.

1.2.3 SWOT Analysis

Based on the analysis done for external environment and internal environment, SWOT analysis is conducted in this study. Table 1.3 shows the detail of the strengths, weaknesses, opportunities and threats.

Table 1.3: SWOT analysis

Strengths	Weaknesses
• Strong Management in Sabah State enables the staffs become independent and multitask. • Staffs in Sabah State Office is digital literate	• To apply for budget, proposal must be submitted to headquarters and the approval process is lengthy. • Due to tremendous workload at certain times, processing NFIP application has become low priority.
Opportunities	**Threats**
• Good economy condition increases the ability for the government to allocate more budget on infrastructure. • Most of the millennial are more tech savvy compared to baby boomers, gen-Y and gen-Z. • Advance technology may reduce manual labour and repetitive works. • The source of power for MCMC comes from Communications and Multimedia Act 1998.	• Direction of the organization is determined by the current government. Changing of government will affect the structure and operation of the organization. • Telecommunication device and equipment consists of lithium and microchip that is indisposable.

1.3 Problem Statement

In the context of Sabah, Network Facilities Providers (NFP) has to obtain the approval for the telecommunication infrastructure building plan from local authority prior the installation of the structure. The application of the building plan cannot be submitted directly to the local council but has to be made through the one stop agency

(OSA) appointed by the Sabah state government. WHSB Trading Sdn Bhd is appointed since 2005 to process the application.

As a requirement, each application submitted must include comment from four technical agencies below;

i. Malaysian Communications and Multimedia Commission (MCMC)
ii. Sabah Electricity Sdn Bhd (SESB)
iii. Civil Aviation Authority of Malaysia (CAAM)
iv. BOMBA

As stated in the above, Malaysian Communications and Multimedia Commission (MCMC) Sabah State Office is one of technical agencies responsible to provide the comment in the form of official letter named "Surat Ulasan" to the NFP for each application. Hence, MCMC Sabah State Office (SBSO) will be the case partner for this study.

Currently, there is no clearly defined process flow of Network Facilities Installation Permit (NFIP) application in Sabah State Office. All the application only submitted to Sabah State Office by the service providers in the form of hard copy. The conversion to softcopy will be done by the assigned person-in-charge in SBSO for each application received. Only then, the application will be sent to the designated officers in SBSO or branch offices for further process. The process involves quite number of documents and manual data entry. Since there is no clearly defined process flow on the NFIP application process, there are few problems occur as listed below;

i. As the email is the only medium being used to handle application in the current practice, there were cases that the applications were missed out by the assigned officer.
ii. It is difficult to monitor the timeline in between the date of application received until the date of "surat ulasan" is provided.
iii. It is inconvenience to extract information from the past NFIP application data.

1.3.1 Problem Diagnosis

To diagnose the current problem in Network Facilities Installation Permit (NFIP) application process in Sabah State Office, the researcher uses Ishikawa cause and effect diagram. There are four factors being considered to be included in the diagram which is people, process, management, and equipment as shown in Figure 1.2

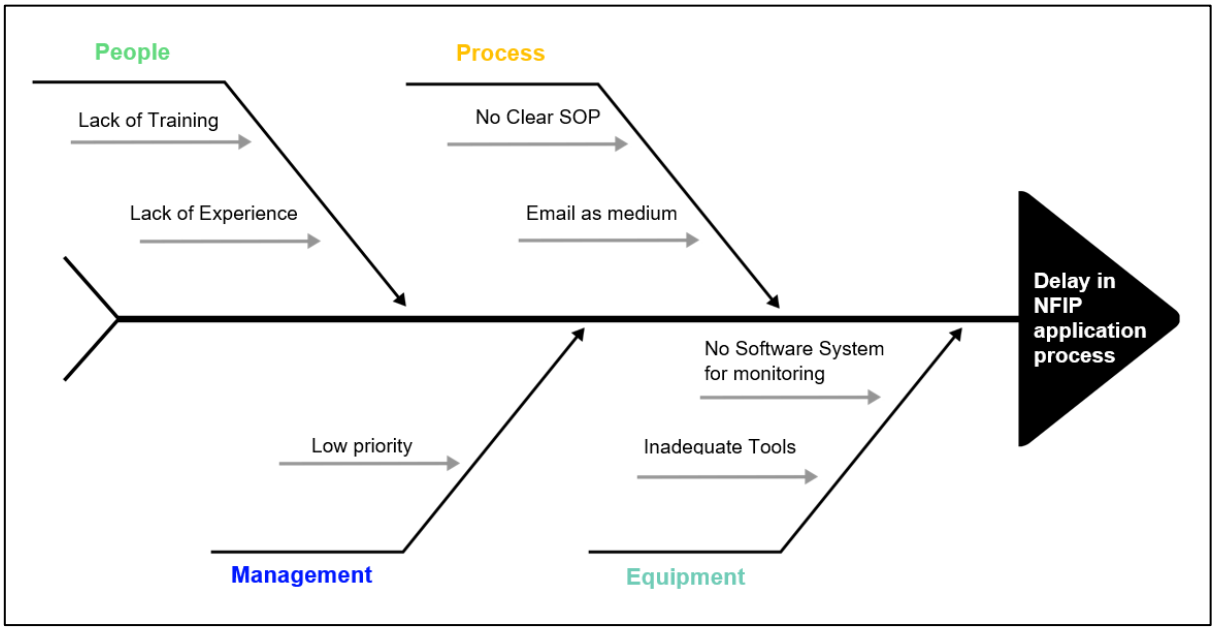

Figure 1.2: Ishikawa Diagram for NFIP application process

The first factor considered is manpower. Newly recruited officer usually does not equip with knowledge in completing new task. This is because most of them are fresh graduates or individuals with less than three years working experience. In the current moment, there is no specific module or guidelines given to these officers for them to handle NFIP application. Normally, they will be given hands-on training by the senior officer during their probationary period, but it is not mandatory. There is no proper training module for newly recruited officers to handle NFIP application until now.

The second factor is work process. There is no clear standard operating procedure (SOP) to handle the NFIP application as far as the researcher concern. Person in charge in Sabah State Office will received the application in hardcopy from Network Facilities Provider (NFP) and scan all the required documents into softcopy.

The application the send to the responsible officers via email. Due to that, there is possibility of delay in the application process when the responsible officers overlook the NFIP application.

There are two main departments and four units in Sabah State Office (SBSO). Apart from overseeing the telecommunication infrastructure development in Sabah, the state office also covers others scope of job such as customer complaint, regulatory compliance, advocacy as well as resource monitoring. SBSO also deals with state agencies as strategic partner to speed up the rate of telecommunication infra readiness in Sabah. Due to heavy workload at times, task like handling NFIP application has become low priority.

The fourth factor is equipment. NFIP application process will be treated slightly different based on the type of application. If the application falls under Universal Service Providence (USP) initiative under MCMC, the officer has to visit the proposed location to check its suitability based on criteria such as coverage objectives, geographical condition and population. Lack of equipment for site survey such as digital measuring tape and drone often reduce the quality of their findings from the visit. In contrast, if the NFIP application is under commercial, then the officer will only make the evaluation based on required documents attachment consists of Tower Inspection Checklist (TIC) and locality plan as well as technical drawing endorsed by professional engineer.

1.3.2 Theoretical Gaps

There are limited number of studies available on the chosen research topic. Based on Web of Science, there are only 96 academic records found based on topic category as shown in Figure 1.3.

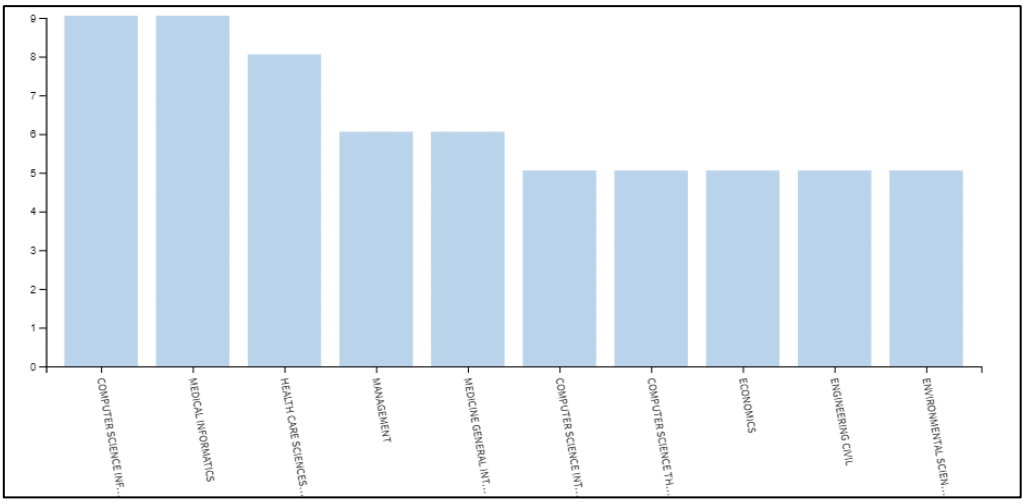

Figure 1.3: Web of Science academic records based on topic category

Other than that, most of the academic records based on country category in Figure 1.4 shows that there are no academic records conducted in Malaysia found in Web of Science on the research topic related by using keywords "process improvement", "office management", and "information system".

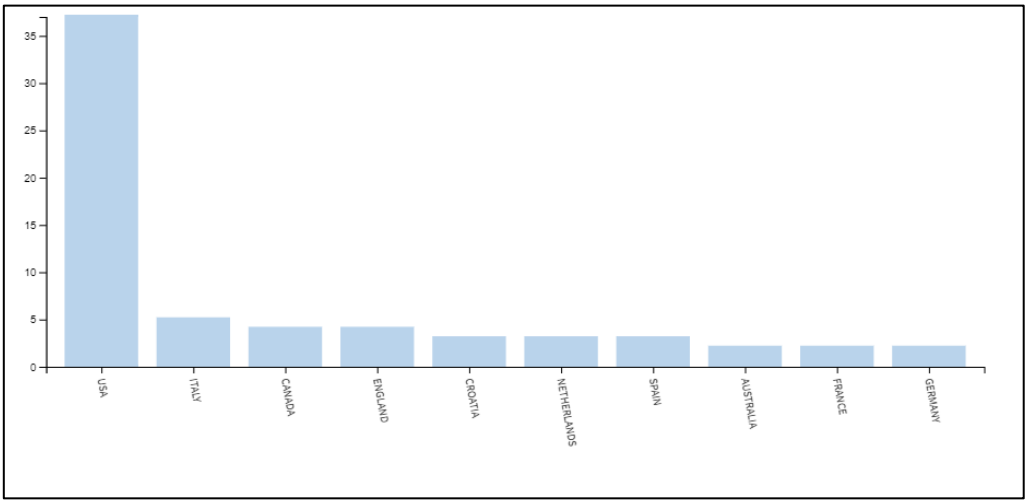

Figure 1.4: Web of Science academic records based on Country

1.3.3 Practical Gaps

There is no study or initiative formally conducted in SBSO to address the issue of NFIP application process at the current moment. Based on observation in the current process, there officers came up with their own initiative but the reason is more on reporting purpose rather than improving the process itself. The task is considered

business as usual and not given priority compared to other scope of jobs under infra development.

1.4 Research Questions

A well-formed research questions are essential for the action research success. The nature of related activities engaged like data collection and analysis will be determined from the research questions. For this study, there are three research questions identified as follows;

1. What are the issues and challenges in the current process of Network Facilities Installation Permit application?
2. How to improve the process of Network Facilities Installation Permit application?
3. What is the impact of the intervention proposed on the Network Facilities Installation Permit application process?

1.5 Research Objectives

Research objectives are the concise statement of what the researcher expects to achieve from the study. It should be clear and achievable as the objectives will provide answer for the research questions formulated earlier. There are three research objectives set out in the study;

1. To identify the issues and challenges in the current process of Network Facilities Installation Permit application in Sabah State Office.
2. To implement intervention action to improve the existing Network Facilities Installation Permit (NFIP) application process.
3. To evaluate the impact of the intervention implemented in improving the Network Facilities Installation Permit (NFIP) application process.

1.6 Researcher's Role

To ensure the success full execution of the study, there are number of roles that the researcher will play from the beginning until the study is completed. The researcher has to identify the personnel involves in the NFIP application approval process within the organization. Current process of application handling has to be examined thoroughly together with all the documents and record involves. During the process, the researcher must aware that the participants involved in the study are working as well and any activity planned involving them must be schedule in advance.

1.7 Research Ethics

Any information and data obtained during the study have to be treated with ethical responsibilities and confidentiality. The researcher shall not disclose any sensitive information in regard with the organization involves in the study. Only related data which is approved by the management will be used and the data obtained must be interpreted honestly without bias. Intervention action proposed by the researcher must be practical for implementation considering the time factor and the organization capability. The action proposed implementation stage must be discussed in detail with the personnel involved in the process to ensure that it is still under their scope of job.

1.8 Significance of the Research

The research is significant in theory in its contribution to the body of knowledge. In practice, the research is expected to improve work process in the organization within the scope of the study.

1.8.1 Significance to Theory

Contribute to body of knowledge in the topic of process improvement in organization. From the theoretical gap discussion, there are limited number of academic journals and research papers that cover the research topic. The outcome from

this research will be beneficial as reference and guide in future research within the similar environment or demographic settings.

1.8.2 Significance to Practice

The proposed research is important in improvement of the NFIP approval process in SBSO in general. The study will be used to identify and examine all the factors that causing the delay in the NFIP application process and proposed the suitable intervention action for implementation. The improvement in the process within SBSO will be indirectly speed up the further process of the NFP in obtaining the telecommunication infrastructure plan approval from local authorities once the application is submitted through OSA. As the government agency that foresee the telecommunication industry, it is the aim SBSO to ensure the rollout of telecommunication infrastructure is smooth especially now, where the internet connectivity demand has rapidly increasing.

1.9 Definition of Terms

Table 1.4: Definition of the term

Term	Definition
MCMC	Malaysian Communications and Multimedia Commission.
NFP	Network Facilities Provider. Service provider in telecommunication industry that is licensed and registered to MCMC.
NFIP	Network Facilities Installation Permit. Comment made by SBSO in form of letter for NFP as one of the requirements for local authorities.
SBSO	MCMC Sabah State Office. State office consist of one main office located in Kota Kinabalu and three other branch offices located in Sandakan, Tawau and Keningau.

OSA	One Stop Agency. The company appointed by Sabah State Government to receive the telecommunication infrastructure application.
TIC	Tower Inspection Checklist. A checklist submitted by the NFP in NFIP application together with cover letter and drawing.

REFERENCE

Ali et al. (2019) Evaluating the intended use of Decision Support System (DSS) via Academic Staff: An Applying Technology Acceptance Model (TAM)

Arbabi, H., Salehi-Taleshi, M. J., & Ghods, K. (2020). The role of project management office in developing knowledge management infrastructure. Engineering, Construction and Architectural Management, 27(10), 3261–3287. https://doi.org/10.1108/ECAM-11-2019-0600

Chalupa, S., Petricek, M., & Ulrych, Z. (2021). The Use of Business Process Management in Hotel Direct Sales Improvement. TEM Journal, 10(1), 215–220. https://doi.org/10.18421/tem101-27

Communications and Multimedia: Facts and Figures, 2Q 2020 https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/2Q-2020-C-M.pdf

Coghlan and Brannick (2005). Doing Action Research in Your Own Organization, Sage Publications.

Chua, Y. P. (2011). Kaedah Penyelidikan. Selangor: McGraw Hill (Malaysia) Sdn. Bhd.

da Costa, J. M. H., Amaral, C. S. T., Fernandes, S. da C., & Rozenfeld, H. (2019). A new way to diagnose the new product development process based on recurring current reality trees. Business Process Management Journal, 25(4), 667–687. https://doi.org/10.1108/BPMJ-01-2017-0020

Dasgupta (2002). Eighth Americas Conference On Information Systems 1149measurement Of User Satisfaction Withweb-Based Information Systems:An Empirical Study.

Davis (1993) User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. Int. J, Man-Machine Studies 38,475-487.

Doll, W.J., and Torkzadeh, G (1988). The measurement of end-user computing satisfaction. MIS Quarterly, 12, 259–274.

Doll et al. (2004) The Meaning and Measurement of User Satisfaction: A Multigroup Invariance Analysis of the End-User Computing Satisfaction Instrument.

Kanwal et al. (2008), Telecommunication Infrastructure Development and Economic Growth: A Panel Data Approach. Pakistan Development Review Page 711-726.

Lim (2008). Validating an End-User Computing Satisfaction Instrument: A Confirmatory Factor Analysis Approach Using International Data. Journal of

International Technology and Information Management. Vol 17, Issue 2, Article 6.

Marinov, O., & Tsankova, R. (2011). Administrative Management Processes Improvement Through Collaboration Technologies Implementation. National and European Values of Public Administration in the Balkans, 4, 52–59.

Minehane (2019), ITU Digital Infrastructure Policy and Regulation in Asia-Pacific Region. https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/SiteAssets/Pages/Events/2019/RRITP2019/ASP/ITU_2019_Digital_Infrastructure_5Sep2019FNL.pdf

Nadiri, I. M., & Nandi, B. (2003). Telecommunications infrastructure and economic development. In Traditional Telecommunications Networks (Vol. 1, pp. 293-314). Edward Elgar Publishing. https://doi.org/10.4337/9781781950630.00019

Nowotarski, P., Paslawski, J., & Skwarek, J. (2019). Waste Reduction by Lean Construction-Office Building Case Study. IOP Conference Series: Materials Science and Engineering, 603(4). https://doi.org/10.1088/1757-899X/603/4/042061

Praharaj et al. (2017), Innovative civic engagement and digital urban infrastructure: Lessons from 100 Smart Cities Mission in India. Procedia Engineering 180 Page 1423 – 1432.

Smaizys, A., & Vasilecas, O. (2009). Business rules based agile ERP systems development. Informatica, 20(3), 439–460. https://doi.org/10.15388/informatica.2009.259

Terpend, R., & Shannon, P. (2021). Teaching Lean Principles in Nonmanufacturing Settings Using a Computer Equipment Order Quotation Administrative Process. Decision Sciences Journal of Innovative Education, 19(1), 63–89. https://doi.org/10.1111/dsji.12227

Tomasino, A. P., Fedorowicz, J., & Williams, C. B. (2017). Public sector shared services move out of the back-office: The role of public policy and mission criticality. Data Base for Advances in Information Systems, 48(3), 83–109. https://doi.org/10.1145/3130515.3130521

Vucina, D., & Fabac, R. (2017). Organizational Resilience and Risk Management Improvement - How to Reduce and Prevent Fire Hazard Using Simulation

Scenarios. Economic and Social Development (Esd 2017), September 2017, 494–506.

Zhang (2015) PPP application in infrastructure development in China: Institutional analysis and implications. International Journal of Project Management Volume 33, Issue 3, April 2015, Pages 497-509.