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DEVELOPMENT OF AN ONLINE RESERVATION AND MONITORING SYSTEM FOR THE USE OF TWC DORMITORY, FUNCTION ROOMS AND VEHICLES

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List of Acronyms and Abbreviations

APACC	Asia Pacific Accreditation and Certification Commission
ASEAN	Association of Southeast Asian Nations
e-	TESDA Online System
TESDA	
FASSU	Finance and Administration Support Services Unit
ICT	Information and Communications Technology
IT	Information Technology
KPI	Key Process Indicators
NCR	National Capital Region
OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
TechVoc	Technical and Vocational
TESDA	Technical Education and Skills Development Authority
TWC	TESDA Women's Center

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Research Summary

The Development of an Online Reservation and Monitoring System for the Use of TWC Dormitory, Function Rooms and Vehicles increase the efficiency and timeliness of services and improve the business process of the TWC. The development of the System involves studying the reservation, occupancy and use monitoring needs, current business processes and systems design in place at the TWC, and develop a system that increases and improves the business process of the organization. At the end of the study, the most appropriate, efficient, and useful system should be in place for TWC to manage its reservations, occupancy and usage of facilities.

In conducting this action research, the research team employed desk review and use of available secondary data, one-on-one structured or semi-structured interviews, focus group discussions, and the direct observation method. The sponsors, the systems designer and implementer, process owners, and the users were consulted and involved in determining the system design. The data content was analyzed, existing policies were reviewed, the results were contextualized based on the stakeholders and gender, and SWOT and risk analysis were conducted over the course of the study.

The study found that there was a need to capture what the business user needs to do and what the software needs to do to support the business user. In designing the technical details and design of the system, some of the issues that surfaced were the lack of technologies to provide better benchmarking for the process/system, the lack of dedicated personnel to oversee the research and development of the system, and the need for process owners to be more involved in developing the system, among others.

In conclusion, the critical factors needed to ensure the success of the TWC systems approach are the presence of: drivers of reform from without and within the organization, an overall vision and strategy, the ability to manage a project effectively, effective change management, design, requisite competencies, and adequate funding and technological infrastructure.

Further, the research recommends for the TWC Leadership to continue championing and promoting research and development, allocating resources for the maintenance, expansion and roll out of the systems proven to be efficient and effective to the TWC, and supporting innovative approaches to systems development and promotion of information systems.

Chapter 1: Introduction

1.1 Rationale

Almost all governments are moving towards digitalization and automation of services to provide more efficient and effective ways of delivering services to citizens. The use of information and communications technology can bring about differentiated experiences in actualizing better government performances both in its internal and external operations and business processes. When the performance areas of government become aligned in actualizing public good, the resulting benefits can include cost reductions, revenue growth, greater convenience and increased transparency. (World Bank cited in ICTD UNAPCICT 2008)

The World Bank (2000) defines e-Government as the use by government agencies of information technologies, such as use of the internet, wide area networks, and mobile computing, that have the ability to transform relations with citizens, businesses, and other arms of government.¹These technologies can serve a variety of different ends: “better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management.” (World Bank, 2000)For the OECD, the term “e-Government” focuses on the use of new ICTs by governments as applied to the full range of government functions. In particular, the networking potential offered by the Internet and related technologies has the potential to transform the structures and operation of government. Hence e-Government holds tremendous potential to strengthen targeted service delivery to women (Huyer 2010 cited in Gurumurthy, IT for Change, 2016) and men.

The TWC has made significant strides in advocating for women empowerment and gender mainstreaming since its establishment in 1993.It aims to become a leading Knowledge Hub on Women Empowerment in TVET in ASEAN. This is in line with the proposed expansion of the TWC, in preparation for the Philippines’ leadership role in ASEAN 50, to grow as the ASEAN Women Research and Development and Vocational Training Center.

However, there is a need to strengthen the TWC’s research and development function due to its limited number of personnel and capacity. Likewise, the APACC recommends that TWC develop and conduct action researches that will “find solutions to existing problems in the workplace or environment or searching for a clarifying explanation of an observed phenomenon”.

In preparation for the TWC’s APACC accreditation in 2018, it sought to take proactive measures by conducting researches in partnership with external researchers who will assist and guide the R&D staff members in the research processes. In so doing the TWC expects to improve its R&D capacity and specifically:(1) increase the participation of the R&D staff in research and development; (2) develop and undertake action researches; (3) utilize the research outputs within the institution, community and industry; (4) publish the research outputs in the TWC newsletters, research journal, and the website; and (5) Enhance the capacity of the TWC R&D staff in the conduct of action researches through technical assistance of an external expert.

¹ The World Bank, “Definition of e-Government”, <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/EXTEGOVERNMENT/0,,contentMDK:20507153~menuPK:702592~pagePK:148956~piPK:216618~theSitePK:702586,00.html>

The TWC sees the potential benefits of using information, communications technology in its operations and service delivery. While it requires more capacity (resources, time and effort) to be able to actualize these benefits, it has gradually and willfully implemented creating and developing its online systems. One of these include the online reservation and monitoring system for the use of the dormitory, function rooms and vehicles.

This research was done in collaboration with the TWC officials, the ICT administrator, the Research and Development staff, the process owners and users of the TWC administration department and the dormitory staffs.

1.2 Problem Statement and Objectives

The main research question of this action research is: What is the system that is most useful and appropriate for TWC in the reservation and monitoring of occupancy and usage of its facilities. Thus, the principal research objective is to assess the existing systems and identify the most appropriate and useful and more efficient for TWC in its reservations, occupancy and usage of facilities. Specifically:

1. To identify and assess the most appropriate system useful for TWC in the reservations and monitoring of occupancy and usage of its facilities;
2. To document and assess the requirements and development of the TWC system;
3. To identify the criteria used in the selection and development of the system;
4. To document the business processes that are undertaken to ensure an efficient and cost-effective system;
5. To document and assess the testing and training undertaken of the new system; and
6. To document/identify the future requirements in relation to the maintenance and upgrading of the system.

1.3 Theoretical and Conceptual Framework

The study delves on the e-Government framework and the processes of systems development. The research is a descriptive study that aims to describe the business process, systems development, and use of the system.

The framework

The study anchors on the e-Government framework and systems development concepts and theories.

E-Government is a relatively new concept which refers to the use of ICTs to improve the activities of a government agency or organizations. The action research being undertaken by TWC is covered by this concept.

The system being proposed and will be developed will be tested whether it will increase efficiency and timeliness and improve the business process of the organization. The conceptual framework of the action research is shown in Figure 1.

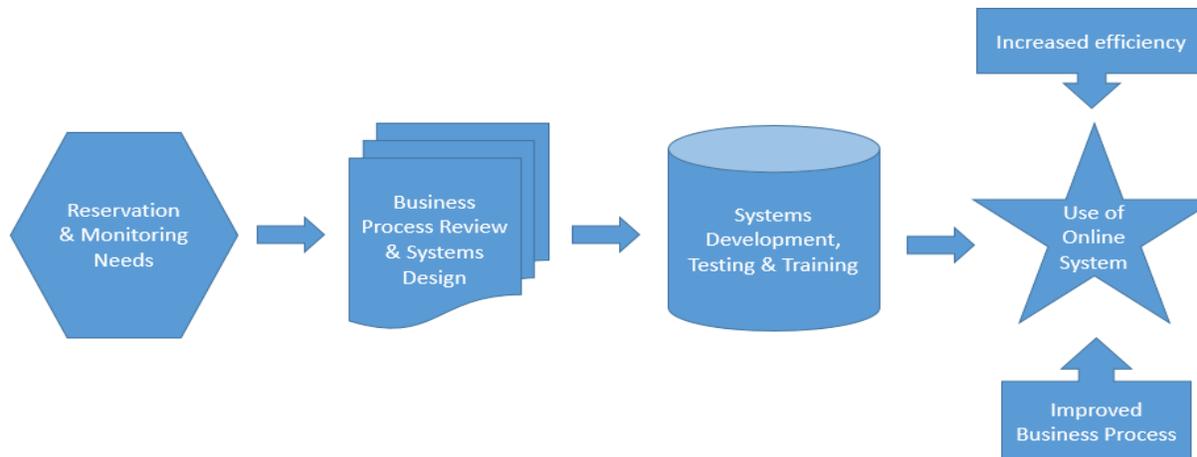


Figure 1: Conceptual Framework

Definition of concepts

Reservation, occupancy and use monitoring needs. The TWC identifies the need to develop a system that will enable users to reserve in the dormitory and room facilities, as well as monitor the occupancy and use of these facilities including the vehicle reservation and use.

Business process review. Business process refers to the set of activities and tasks which are linked to deliver a service or product to clients. In this research the business process involves the document forms for reservations and use of the facilities such as the dormitory, rooms, and vehicles.

Systems design. Systems design refers to the definition of the architecture, modules, interfaces, and the data for a system to meet specified requirements. Operationally the systems design refers to the illustration and documentation of the design to show the systems elements and how the system will be developed using software programs and applications, the required data, as well as relationships from one system to another. The design shall also cover the necessary steps in the systems development cycle including the procurement of goods and services that may be required in the process.

Systems development and testing. Systems development is defined here as the actual creation and implementation of a new software application that is customized as a database system for the reservation, occupancy and monitoring of use of the dormitory and room facilities and vehicle usage. Once the actual systems and modules are in process and developed, these will be tested by the developers and users to ensure that these meet the systems business requirements.

Systems training. If the systems have passed the testing, the information on use are disseminated through training.

Increased efficiency and improved business process. Upon development, testing, and use, the system will be assessed to show its actual rate of efficiency – time, motion and costs - to compare with the manual process by process owners both the deployment and monitoring group as well as the users, specifically the clients who will make reservations of the facilities.

1.4 Scope and Limitations of the Study

The study covers the reservation systems for the TWC rooms, dormitory, and the vehicles. The research activities were limited to the meetings conducted, the benchmarking activities, the observation on the module development of the system, and the user testing. The research was conducted from the months of August to December 2017.

While the research activities were planned to visit a number of agencies and institutions for the benchmarking activities, only two responded and accommodated the request for observation and downloading of similar systems.

The research was also limited by the busy schedules of the TWC staff because of other important planned institutional activities during the research time frame.

1.5 Report Organization

The report outline is organized as follows

The Introduction/Background and Purpose Section of the Evaluation provides an overview of the study and discuss the purpose and intended audiences of the research, and the key questions as identified by the TWC researchers.

Review of Related Literature offers a wide range of discussion on the e-Government framework that guided the research study.

The Research Approach and Method Section contains a brief summary of the approaches and methods to be used in the research as well as additional information, including instruments.

The Findings Section presents the empirical facts and other types of evidence the researcher(s) collected on the observations of the systems development process.

The Conclusions and Recommendations Section presents the interpretations or judgments about the research findings based on the key questions, and enumerates potential actions offered to be taken based on the results of the research.

The Annexes shall include available supplementary information on the evaluation itself, further description of the data collection/analysis methods used, data collection instruments, summaries of interviews, statistical tables, and other relevant documents.

Chapter 2: Review of Related Literature

This chapter offers a wide range of discussions and studies on e-Government and how these studies are related to this research.

2.1. Definitions of e-Government

There are many definitions of e-Government. The UN defines it as the utilization of the Internet and World Wide Web for delivering government information and services to citizens.² For the World Bank, as mentioned earlier, it is the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. And for the OECD, the term “e-Government” focuses on the use of new ICTs by governments as applied to the full range of government functions. In particular, the networking potential offered by the Internet and related technologies has the potential to transform the structures and operation of government.³ Broadly, e-Government can be defined as the application of ICTs to enhance the performance of government functions and services. More specifically, e-Government is “the use of digital technologies to transform government operations in order to improve effectiveness, efficiency and service delivery.”⁴ Accordingly, e-Government should leverage ICTs to help the public sector operate more efficiently and provide better services to internal constituents, citizens and businesses.

The government of the Philippines has long been planning and implementing e-Government through the automation of its front and back end applications.

2.2. Benefits of e-Government

The OECD enumerates the benefits of e-Government as:⁵

- e-Government helps improve efficiency in government. ICTs are a necessary enabler of reforms to the ways in which public administrations work. Improving internal operating systems—financial systems, purchasing and payment arrangements, internal communications and sharing of information—and programme processing and delivery arrangements can generate operating efficiencies and improve performance.
- Enhanced quality of service has been a major component of public administration reform over the past two decades, and the use of ICTs to generate improvements in services has been a primary driver for e-Government activity. In particular, the use of the Internet has given a major boost to customer focused, seamless services, which aim to transcend the structure of public administrations. Online services are increasingly seen

² UN Division for Public Economics and Public Administration and American Society for Public Administration, *Benchmarking E-Government: A Global Perspective - Assessing the UN Member States* (2002), p. 1, <http://www.unpan.org/Portals/0/60yrhistory/documents/Publications/Benchmarking%20E-Government.2002.pdf>

³ OECD, “e-Government: Analysis Framework and Methodology”, OECD Public Management Service, Public Management Committee, 13 December 2001, p. 2, [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=PUMA\(2001\)16/ANN/REV1&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=PUMA(2001)16/ANN/REV1&docLanguage=En)

⁴ Mark A. Forman, “e-Government: Using IT to transform the effectiveness and efficiency of government”, presentation dated 15 June 2005, p. 4, [http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/FormanEgov\(6_05\).ppt](http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/FormanEgov(6_05).ppt)

⁵ OECD, *The e-Government Imperative*, OECD e-Government Studies (Paris, 2003), pp. 28-29 <http://pavroz.ru/dov/egovimperative.pdf>

as part of a broader services strategy, with important customer and efficiency benefits. As users of public services are often obliged to interact with government, user dissatisfaction with the quality of government services can quickly become a major political issue.

- ICTs can support more effective outcomes in key policy areas such as health, welfare services, security and education. Ultimately, governments and public administrations exist to deliver policy outcomes, and ICTs are a major enabler across all major policy areas. The use of the Internet to deliver value in these areas is a major preoccupation in member countries.
- Better governance arrangements in themselves will promote economic policy objectives. More specific effects may range from impacts on ICT production, e-commerce diffusion and business productivity to indirect effects such as reduced fiscal requirements owing to more effective programmes and efficiencies flowing through to the broader economy.
- e-Government can help forward the reform agenda. When aligned with modernization goals, implementing e-Government can help administrations focus on the additional changes needed to meet service delivery and good governance concerns. At the same time, it provides some valuable reform tools and builds support from high-level leaders and government employees for achieving those objectives.
- Through citizen engagement, e-Government can improve the overall trust relationship between government and public administrations. e-Government, by improving information flows and encouraging active participation by citizens is increasingly seen as a valuable tool for building trust between governments and citizens.

In summary, e-Government can offer a number of benefits, including better quality government services, higher efficiency, less costs, a lower administrative burden on citizens and businesses, shorter processing times, increased citizen participation in the decision-making process, and enhanced transparency.

2.3. e-Government and Good Governance Principles

E-Government must operate within the framework of good governance. The latter is also referred to as the Good Governance Principles. These principles include¹. Legitimacy and Voice – participation and consensus orientation; 2. Direction – anchored on a strategic vision; 3. Performance – centered on responsiveness, effectiveness and efficiency processes; 4. Accountability – accountability and transparency; 5. Fairness – covering equity and the rule of law.⁶

On **Legitimacy and Voice**, participation refers to the idea that all men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their insights; and consensus orientation sees the mediation of differing interests to reach a broad consensus on what is in the best interest of the group and, where possible, on policies and procedures.

⁶www.goodgovernance.org.au/about-good-governance/what-is-good-governance/

Direction in good governance takes a serious look on strategic vision where leaders and the public have a broad and long-term perspective on good governance and human development, along with a sense of what is needed for such development.

Performance anchors on responsiveness where institutions and processes try to serve all stakeholders; and on effectiveness and efficiency where processes and institutions produce results that meet needs while making the best use of resources.

Accountability is focused on decision-makers in government, the private sector and civil society organizations that are accountable to the public, as well as to institutional stakeholders. Likewise, accountability refers to transparency which is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.

On **Fairness**, the concepts of equity where all men and women have opportunities to improve or maintain their well-being; and in the rule of law which upholds the legal frameworks that are fair and enforced impartially, particularly the laws on human rights.

Having these principles in mind, Good Governance requirements in e-Government therefore outlines the organization and leadership imperatives for efficient, effective, reliable, sustainable and secure governance and management of ICT services. It is specifying decision rights and accountability framework to encourage desirable behavior in the use of ICT in the organization.

Leadership comprises the decisions stated at the high-level on how ICT is to be used by the organization in order to bring about the business and service principles in pursuing the social and economic development goals. Good governance requirements in e-Government also must cover the Architecture that signifies the decision on the integrative model and the set of performance, process, data, application and technology reference standards to guide the organization to logically mapped out the requirements and metrics to be implemented in the solution development and delivery of ICT services. It must also include the ICT Infrastructure where decision on the integrative, standard-based and strategic approaches to acquire and construct the ICT foundation of the organization's operating platform, network, application, databases, security and business continuity. Furthermore, Application Solution Needs must be based on decisions about the suitable ICT application to be acquired or developed to enable the technology mediated process to create, capture, share, and re-use information, and to mediate communication, transaction and interactivity.

2.4. e-Government and Gender Equality

For the scholars and policy practitioners, e-Government is certainly much more than the narrow idea of the use of the Internet and other ICTs by government agencies *“for delivering government information and services to citizens”*.⁷ They subscribe to an extended idea of e-Government – one that aligns with the idea of e-Government as the use of a wide range of digital technologies by government agencies, to restructure social relationships – between government and citizens, government and businesses, and within the various arms/wings of government (World Bank 2009, cited in Ju Choi and Zoo 2011). In this vision, e-Government comprises the *sum total* of efforts by government agencies for *“... (making) governments more accountable, transparent, effective and responsive to citizens’ demands;...based on a citizen-centered approach that tailors services to people’s needs rather than to the needs of the agency*

⁷ UN 2005, cited in Jain Palvia and Sharma 2007, pg. 1 cited in Anita Gurusurthy et al, 2016

*delivering them*⁸. Here, e-Government is viewed as comprising not only supply side issues such as the 'push' for e-services, but critical demand side-efforts for citizen uptake and engagement.

e-Government efficacy, especially to meet the goals of women's empowerment, is contingent upon sensitivity and sophistication in the design of service delivery. The connectivity architecture is an important ingredient in this mix, and serves both institutional and individual capacities. Thus, "*....(t)he mobile is but one part of the menu, with a wide-ranging complex of servers, apps, platforms, wired and wireless connectivity, human organization and contextual priorities and much more, powering what we see as 'use'*".⁹ For the majority of the world's marginalized women, situated in developing country contexts, the ability to access the full range of opportunities in the emerging digital eco-system hence requires adequate attention in e-Government initiatives to the connectivity architecture.

2.5. e-Government, Barriers and Critical Success Factors

E-Government is a platform for government to realize the value for money and right service to speak the results required by open government and of development goals (MDGs and SDGs).

Critical processes of e-Government require governance and management, assessment and planning, financial management, solution development and project management, implementation monitoring and evaluation, and continuous improvement.

On one hand the barriers to e-Government¹⁰ include:

- Leadership failures resulting in slow and patchy progress to e-Government;
- Financial inhibitors limiting the flow of investment to e-Government innovation;
- Poor coordination across jurisdictional, administrative and geographic boundaries that holds back e-Government networking benefits;
- Workplace and organizational inflexibility impairing adaptability to new networked forms of information sharing and service provision;
- Lack of trust heightening fears about inadequate security and privacy safeguards in electronic networks;
- Poor technical design leading to incompatibilities between information and communications technology (ICT) systems or difficult-to-use e-Government services and digital divides and choices, where inequalities lead to differences in motivations and competences that constrain and fragment e-Government take-up and fail to address particular user needs.¹¹

On the other hand, the Critical Success Factors in e-Government solutions¹² are:

- **External pressure** - Driver for reform from outside government, e.g. from civil society
- **Internal political desire** - Driver from key government officials for reform and for achievement of e-Government goals

⁸ Huyer 2010, pg. 1 cited in Anita Gurumurthy et al, 2016

⁹ Gurumurthy and Chami 2014, pg. 2 cited in Anita Gurumurthy et al, 2016

¹⁰ Breaking Barriers to eGovernment study (2007): <http://www.egovbarriers.org/>

¹¹ Ibid.

¹² Cited in John Macasio's powerpoint presentations on ICTD training.

- **Overall vision and strategy**- Overall vision and master plan for good governance and for e-Government, identifying 'where we want to get to', seeing IT as the means not the end, and integrating IT with broader reform objectives
- **Effective project management** - Including the use of rigorous process of development and identification in consultation with stakeholders, the use of PM methodologies to ensure results and benefits to government, beneficiaries and stakeholders.
- **Effective change management** - Including leadership with a project champion, use of incentives to create commitment to and ownership of e-gov project, and stakeholder involvement to build support and minimize resistance
- **Effective design** - An incremental/piloting approach with feasible objectives and quick, scalable outcomes; participatory involvement of all stakeholders, leading to designs that meet real user needs and match real user contexts.
- **Requisite competencies** - Presence of the necessary skills and knowledge, especially within government itself; need both management and IT skills and knowledge
- **Adequate technological infrastructure** - Presence of the necessary skills and knowledge, especially within government itself; need both management and IT skills and knowledge
- **Adequate Fund** - Source of fund to initiate, implement and sustain e-Government Solutions framework.

2.6. e-Government and Policies

For e-Government to happen, policies need to be in place. The screen shot below shows the "Policy Triangle of ICT services; these are the business policies, information policies, and technology policies.

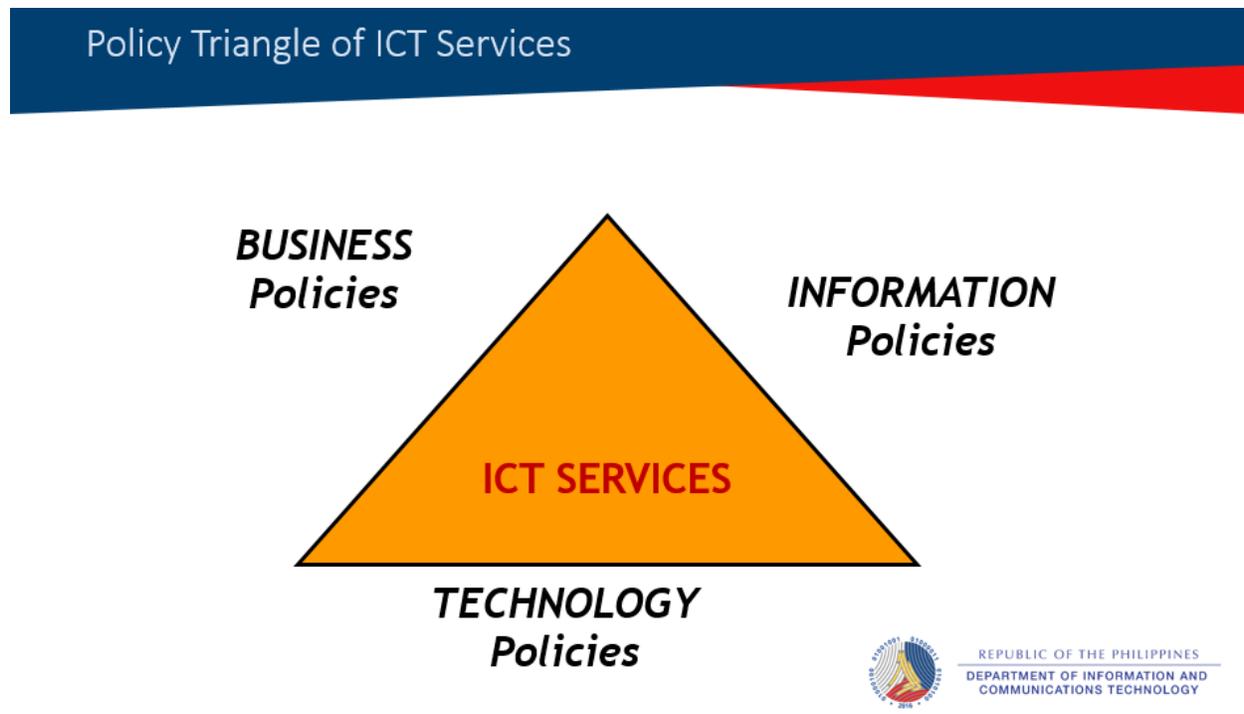


Figure 2: Policy Triangle of ICT Services

From the above diagram, ICT solutions must be supported by policies specifically to be able to:

- Enable mandate, policies, strategies, standards and governance to bring the value of e-Government to programs and projects for reform and development agenda
- Redirect business process improvement of agencies to match performance driven objectives for the internal and external customers.
- Connect the citizen to the network of engagement, participation and productivity.
- Be connected to the platform where citizen finds presence, meaning, expression, dialogue and transaction.
- Realize citizen centric and open systems to bring information, transaction, participation and communication anywhere, anytime, and in any device.

2.7. The TESDA Roadmap

The TESDA Roadmap provides the outcomes and strategic guidelines for its plans of action. The outcomes relevant to this study pertains to O2: Leadership, Management and Innovation. Under this outcome category are the strategies: S1 Implement Good Governance Systems and under this strategy are two main programs: the ICT enabled systems such as the e-TESDA and the TechVoc Information System. The development of applications for more efficient and effective reservation and monitoring processes are considered to be relevant projects in the delivery of the TWC administrative processes.

Chapter 3: Methodology

This chapter covers the discussion on the research methodology. The sections include the method of research, the data collection method, analysis, and procedures of the research.

3.1. The research method used

The study is an action research that aims to document the processes and activities involved in the business process review, systems design and development, and actual use of the system. Action research as a method is outcome based with the purpose of improving the organizational systems. It also calls for a participatory research as it involves several stakeholders such as process owners and users in the actual study.

3.2. Data gathering methods

In general, the following methods for gathering information and data were used: desk review and use of available secondary data, one-on-one structured or semi-structured interviews, focus group discussions, and the direct observation method.

1. **Desk review** pertaining to the available secondary data from TWC and external sources. Using content analysis, data that indicated and measure variability and evidence were culled from documents made available. In the course of observation and data analysis there were patterns and deviations that have emerged which were deemed important to uncover and seek explanations and relationships of variables in

- the study.
2. **One-on-one structured or semi-structured interviews** refer to in-depth interviews to individuals who have thorough knowledge about the activities. These include key stakeholders of the research foci.
 3. **Direct observation** of the actors in the documentation of systems design, development, testing, and training.

3.3. Sample Population and Sampling Frame

The samples included the sponsors, the systems designer and implementer, process owners, and the users (based on alpha users/beta users) in terms of navigating the system, when the system is being used in varying Internet connection speeds, accessibility to people with or without visual impairment.

Below are the main respondents and actors of the action research:

- Systems designer and developer
- Business process owners
- Systems users

The systems design were largely based on the review of the business processes in relation to the reservation and scheduling activities. Likewise, in the validation of activities user testing were conducted to test the use of the system.

3.4. Instruments and Data for Collection

3.4.1. Primary Data.

These data come from the respondents directly interviewed and observed, and those who participated in the user testing.

3.4.2. Secondary Data

Documents, reports, policies, and other related studies formed part of the secondary data. In the draft and final reports, the sources of the secondary data are provided in the Annex section.

3.4.3. Instruments

The research instruments included checklists for secondary data and interview schedules are provided below. Part of the instrument preparation is to ensure efforts toward ethical research consideration, specifically soliciting the informed consent from the respondents during the interviews and direct observations. The research team also observed gender fair language and the sex disaggregation of data.

Table 1 provides the interview guide questions and observation checklist. The guide questions are specifically outlined based on the main problem statement and objectives of the research. The questions are detailed according to the categories are drawn from the phases of the action research: the preparation phase, actual or implementation phase and future plans. The matrix also provides the source of data and information for these phases.

Table 1: Interview guide questions and observation checklist

Categories and Indicators	Source of Data	Interview Guide Questions
1. Preparation: Background and rationale of requirements definition or requirements	<ul style="list-style-type: none"> - TWC Sponsor - TWC systems developer, - TWC R&D 	<ul style="list-style-type: none"> - Why is there a need for this system? <ul style="list-style-type: none"> - Efficiency benefits? (time and motion) - Cost benefits? - What are the business requirements? - Who are the process owners? - What are the current business process and practices? - Who are the users? - Who are the systems developer? - What are policies for collaboration?
2. Actual implementation <ul style="list-style-type: none"> - Business process - Systems development - Testing - Training 	<ul style="list-style-type: none"> - Source of prototype and documentation from designer and developers, process owners and users 	<ul style="list-style-type: none"> - What are the systems requirements? Functional and non-functional requirements? Reasons for these requirements - What was the design? Platform? Modules? Program/applications? - What are the requirements? System Protocols? - What are the criteria used for procurement, access, and program application? - What is the timeframe of systems development, testing and training? - What were the challenges encountered in the development process and actual implementation? <ul style="list-style-type: none"> • In development, • in testing, • in training? - How do the process owners and users find the system during testing? During training?
3. Future plans	<ul style="list-style-type: none"> - Systems administrator, sponsors, process owners and users 	<ul style="list-style-type: none"> - What are recommendations for improvement? For maintenance (who and how)? - When is this planned to take place? - What is the budget allocated for this activity?

3.3. Data Collection Procedures

During data collection, the following were observed:

3.3.1. Conduct of Meetings with Research Sponsors and Systems Developer

The research involved the TWC officials and staff. Several meetings were conducted to discuss the research design, conceptual framework, the research methods, and implementation and testing of the system application or the ICT solution developed. These meetings were documented.

3.3.2. Bench marking

Benchmarking is a tool that facilitates the identification of possible projects for an organization by comparing and measuring an organization's policies, practices and performance against those of high performing organizations in a similar sector.

The benchmarking processes involved are:

- Identification of problems areas using a range of research techniques such as interviews, observations, focus group discussion, process mapping, quality control variance reports and financial ratio analysis. It is important to establish a baseline or the current status of the organization that will serve as a reference point for any improvement effort;
- Identification of organizations that are leaders in the area of interest, by looking at the best in the industry or in any country;
- Surveying the organizations identified for alternative measures and best practices, and
- Visiting the organizations identified to have leading-edge practices.

The research team followed research protocols such as informing the TWC and its concerned partners. Letters were prepared or sought from TWC to introduce the research team. If required and helpful, the guide interview questions were shared with implementing and partner organizations.

The research team visited a number of private and government entities with existing ICT solutions. These were the Southville International room and vehicle reservations and scheduling, the University of the Philippines for dormitory ICT applications. The TWC systems administrator and Research and Development staff were able to access the systems used by the agencies they visited.

3.3.3. Data Analysis

In general, the data analysis used was of a qualitative approach, where data was collected from qualitative method of data gathering, specifically the document reviews, in-depth interviews and direct observations. The data from the sources were collated and organized for disaggregation and consolidation of results. Triangulation and comparison of data were used based on the collated results of the data.

Disaggregation were based on the respondents' sex, age, and location of respondents. Triangulation were used based on the trends of indicators for the research categories.

The Research Team used the following methods to analyze and interpret the consolidated data:

1. **Content analysis** of meeting, interview, and observation documents and secondary data sources. The research team looked into data categories and indicators from gathered forms.
2. **Policy review** on policies and guidelines related to the research.

3. **Stakeholder and gender analysis** were used to contextualize the results as well as cultural analysis if applicable
4. **SWOT and risk analysis** were used to understand the efficiency and effectiveness of results when found applicable.

Chapter 4: Findings

This chapter covers the findings and analysis of the study. The report includes a discussion of the business process, and the systems design.

4.1. Preparation Phase

4.1.1. Requirement analysis

The TWC is a specialized training is a specialized training center well known for providing free quality skills training to women. Aside from training the center also has lecture and function rooms that are being used for events, training and lectures, presentation programs and the like.

The TWC Online Facilities Reservation System an online system designed to manage reservations made by clients/users of TWC facilities such as TWC Dorm, Function rooms/Hall and vehicles.

The objectives of the system are:

- To reduce the workload of staff needed to manage the scheduling of the facilities and vehicles;
- To improve customer service by using ICT resources
- Improve communications
- Eliminate scheduling conflicts;
- Save time and eliminate long process of making a request

4.1.2. Business Case Use

There is a need to capture what the business user needs to do and what the software needs to do to support the business user. Use cases must include technical detail and design documentation.

Use cases contain the following elements¹³:Table 2 provides a summary of the Business Case Use of the TWC Online Facilities Reservation System.

Table 2: Summary of Business Case Use

Element	Brief Description of Element	Actual systems use case
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¹³ <http://www.bridging-the-gap.com/what-is-a-use-case/>

Element	Brief Description of Element	Actual systems use case
Name	A clear verb/noun or actor/verb/noun descriptor that communicates the scope of the use case	The TWC Online Facilities Reservation System
Brief Description	A brief paragraph of text describing the scope of the use case	The client can reserve/book the usage of the facilities or vehicles through the TWC website anytime anywhere; Conflicts can be easily detected upon selecting the preferred dates; The system can quickly displace availability of the facilities and vehicles; User clients and guests can easily get a detailed confirmation of their reservations through their emails;
Actors	A list of the types of users who can engage in the activities described in the use case. Actor names should not correspond with job titles.	Process owners: - FASSU/Facilities Coordinator - FASSU Head - Dormitory Manager - IT Administrator/Developer Users: - IT Administrator/Developer - FASSU - TWC Dormitory Manager - TWC Driver - Clients
Preconditions	Anything the solution can assume to be true when the use case begins	- Internet connection - Web server and web space with valid URL - Email address of clients - System generated Reference code after using the system
Basic Flow	The set of steps the actors take to accomplish the goal of the use case. A clear description of what the system does in response to each user action	The set of steps the actors take to accomplish the goal of the use case. A clear description of what the system does in response to each user action. See screen shots for explanation.
Alternate Flows	Capture the less common user/system interactions	Capture the less common user/system interactions such as being on a new computer and answering a security question. See screen shots for explanation
Exception Flows	The things that can happen that prevent the user from achieving their goal	The things that can happen that prevent the user from achieving their goal such as providing incorrect user name or password. See screen shots for explanation
Post Conditions	Anything that must be true when the use case is complete.	Anything that must be true when the use case is complete. Discussions on maintenance is provided in succeeding sections.

4.1.3. Actors for Systems Design and Development

The actors of the actions research were consulted during the preparatory phase. Below is a description of each set of actors and their role in the preparation and creation of the systems design and modules.

4.1.3.1. *The business process owners*

The business process owners are responsible for managing and overseeing the objectives and performance of a process through KPI. A process owner has the authority to make required changes related to achieving process objectives.¹⁴

For the TWC Online Reservation System the following are the business process owners:

- FASSU/Facilities Coordinator. The responsibility includes
 - Monitoring the reservations of function rooms and vehicles.
 - Preparing the Billing Statement
 - Recommending approval to the FASSU Head of the free use/special discounts given to selected clients (e.g. TESDA NCR, Aboitiz, etc.)
 - Preparing reports in relation to the use of TWC Function Rooms and Vehicles
 - Preparing of trip tickets
- FASSU Head. The responsibility includes
 - Approval of free use and special discounts for the use of TWC Function Rooms, Dormitory and Vehicles
- The Dormitory Manager is the Administrator of the Dormitory Reservations; the responsibility includes
 - Monitors Check-in and Check-out of clients
 - Preparing the Billing Statement for the use of TWC Dormitory
 - Assigned rooms to the guests/client during check-in
 - Preparing reports in relation to the use of TWC Dormitory
- The IT Administrator/Developer is the IT Administration of the system; the responsibility includes
 - Preparing the system to access by clients via internet
 - Upload updates
 - Technical Support of clients
 - Back-up and maintenance of databases used

4.1.3.2. *The users and end-users*

A system user is a person who interacts with a system, typically through an interface to extract some functional benefit. User-centered design, often associated with human-computer interaction inside a wide range of generic systems.¹⁵ The users are also the group of persons who will ultimately use the system or software product or the actual beneficiaries.

The TWC Users of the online reservation system are the following:

¹⁴<https://www.techopedia.com/definition/4525/process-owner>

¹⁵ <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/end-user-development>

- IT Administrator/Developer
- Finance and Administrative Support Services Unit (Facilities Coordinator)
- TWC Dormitory Manager
- TWC Driver
- Clients

The clients are the customers or end users of the system. They are supposed to benefit from the system apart from other users who operate the piece of software.

4.1.3.3. *The systems developer*

The systems developer is the IT Administrator of TWC.

The systems development is not externally procured. It was done in-house by the TWC IT Administrator.

4.1.4. Process Flow

A business process follows steps and stages of tasks to complete a result. A process flow chart represents the business processes and are displayed visually. It is a type of diagram showing the steps as boxes of various kinds and their order by connecting them with arrows. This diagrammatic representation illustrates a solution model to a given problem. A process flow analysis can be conducted to understand the current condition of any processes. It draws upon waste elimination, value adding and visual management to map out an accurate representation of the current processes used to be able to identify areas for improvement of activities.¹⁶

The current process flow of the TWC Function Room Reservation is shown in Figure 3. There are several steps to take from start to tend of the business process. In the TWC Online Reservation System, there are several steps that are eliminated which are described in the succeeding discussions.

¹⁶ <https://crmbok.powerobjects.com/basics/business-process-flows/>

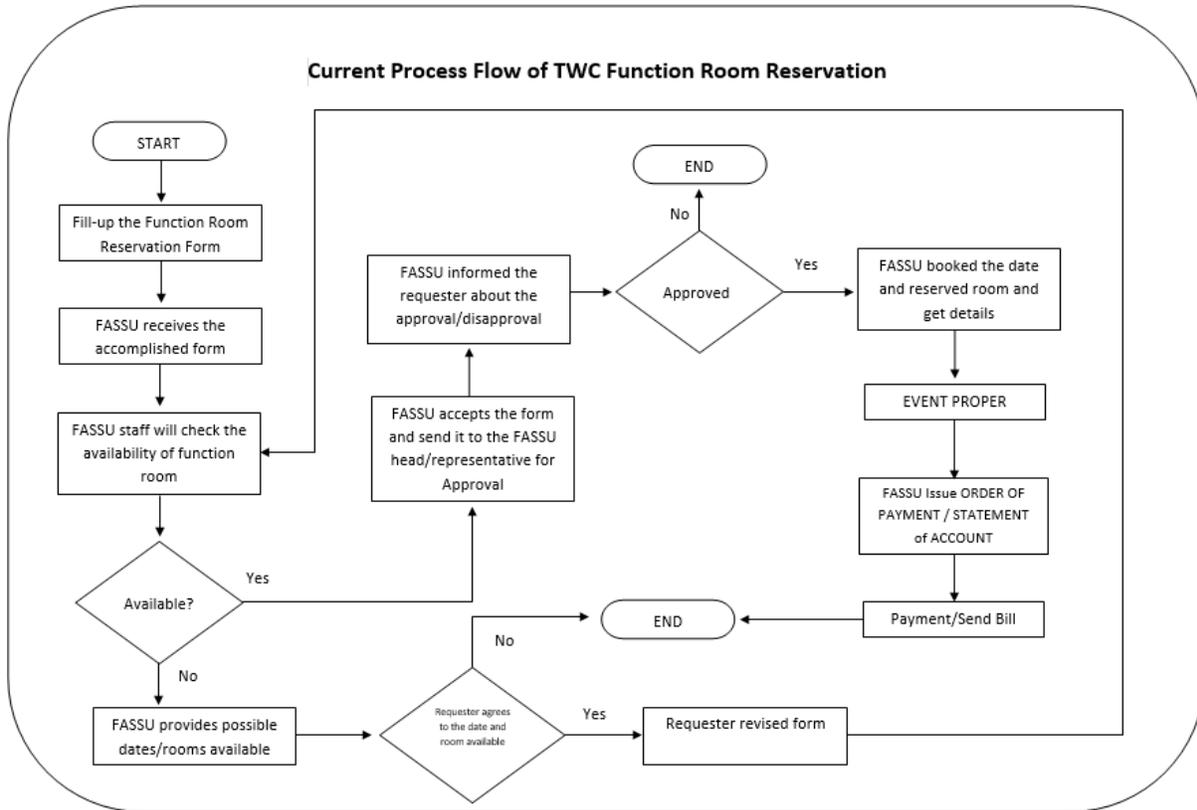


Figure 3: Process Flow of TWC Function Room Reservation

The current process flow of the TWC Dormitory Reservation is shown in Figure 4. There are several steps to take from start to tend of the business process. In the TWC Online Reservation System, there are several steps that are eliminated which are described in the succeeding discussions.

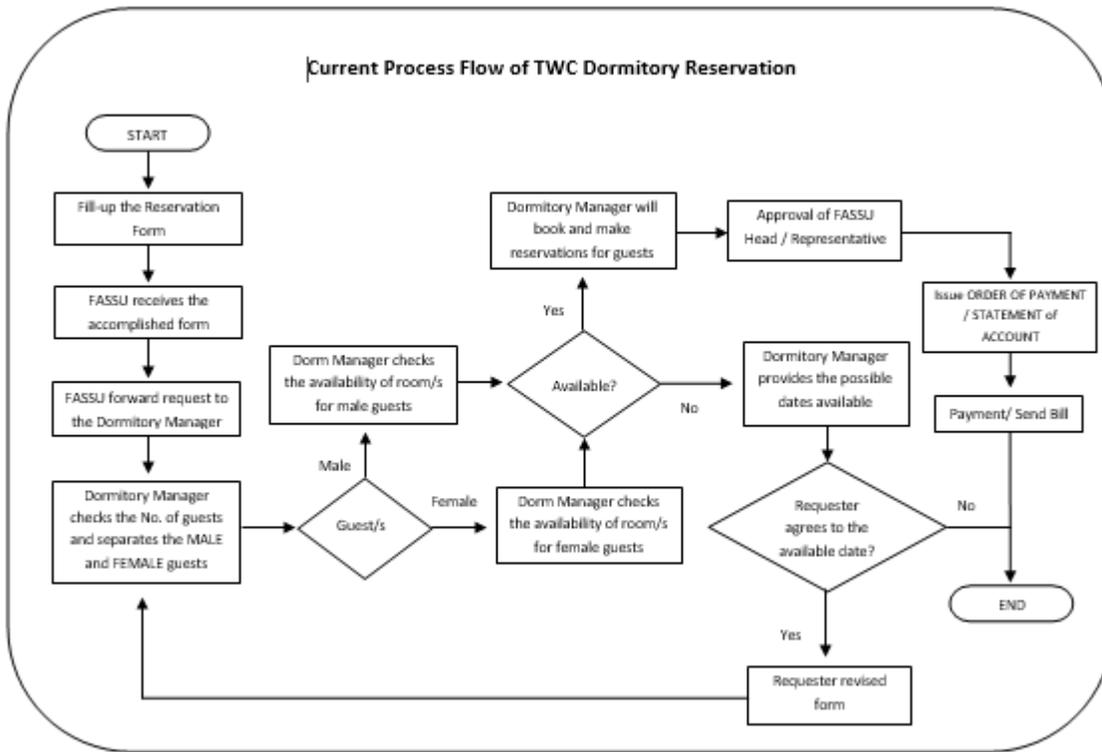


Figure 4: Process Flow of the TWC Dormitory Reservation

The current process flow of the TWC Vehicle Reservation is shown in Figure 5. There are several steps to take from start to end of the business process. In the TWC Online Reservation System, there are several steps that are eliminated which are described in the succeeding discussions.

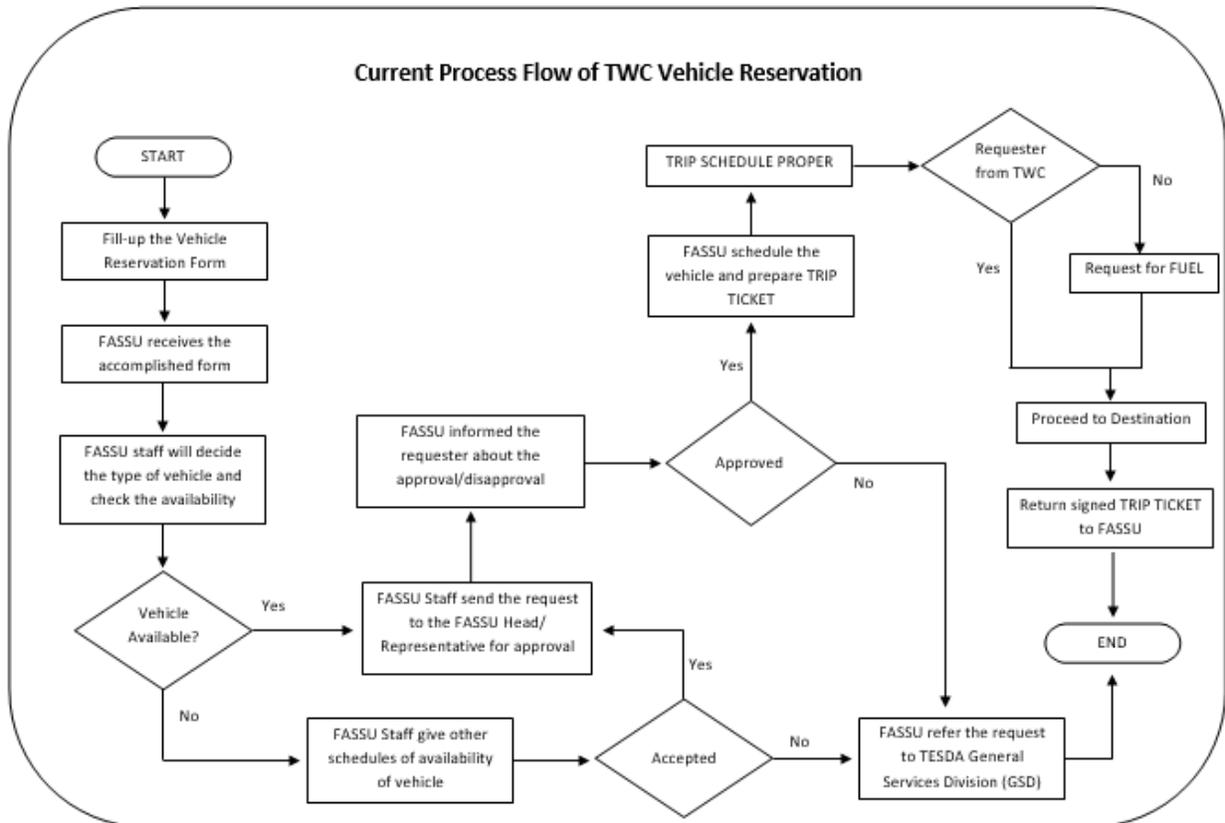


Figure 5: Process Flow of the TWC Vehicle Reservation

4.1.5. Benchmarking (South Ville model)

Benchmarking process includes the study on the Southville school scheduler. This can be accessed in the following link <http://www.southville.edu.ph/scheduler/Web/>.

The research team visited a number of private and government entities with existing ICT solutions. These were the Southville room and vehicle reservations and scheduling, the University of the Philippines for dormitory ICT applications. The TWC systems administrator and Research and Development staff were able to access the systems used by the agencies they visited.

The Southville International School and Colleges “Online Scheduler” is a reservation and scheduler systems; the way it is viewed are shown in the screen shots of Figures 6 and 7, the former without data and the latter with data. The application requires registration of users. It has several features and functions as shown below.

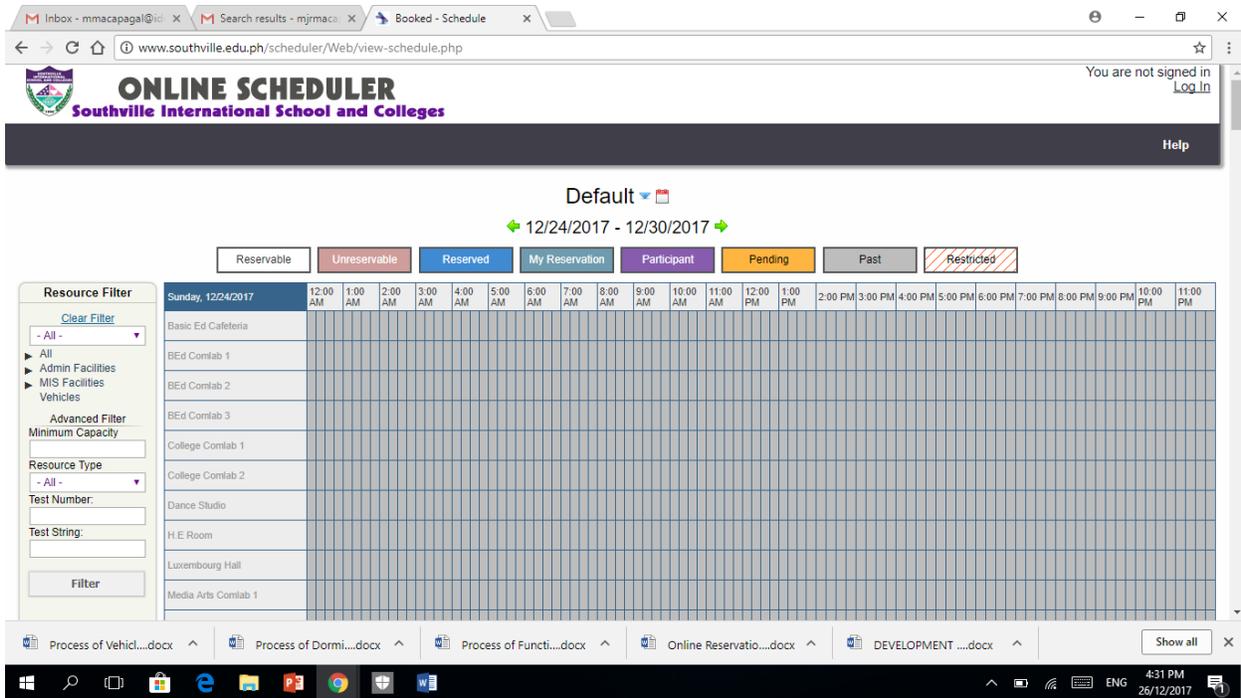


Figure 6: Screen shot of the Southville Scheduler without Data

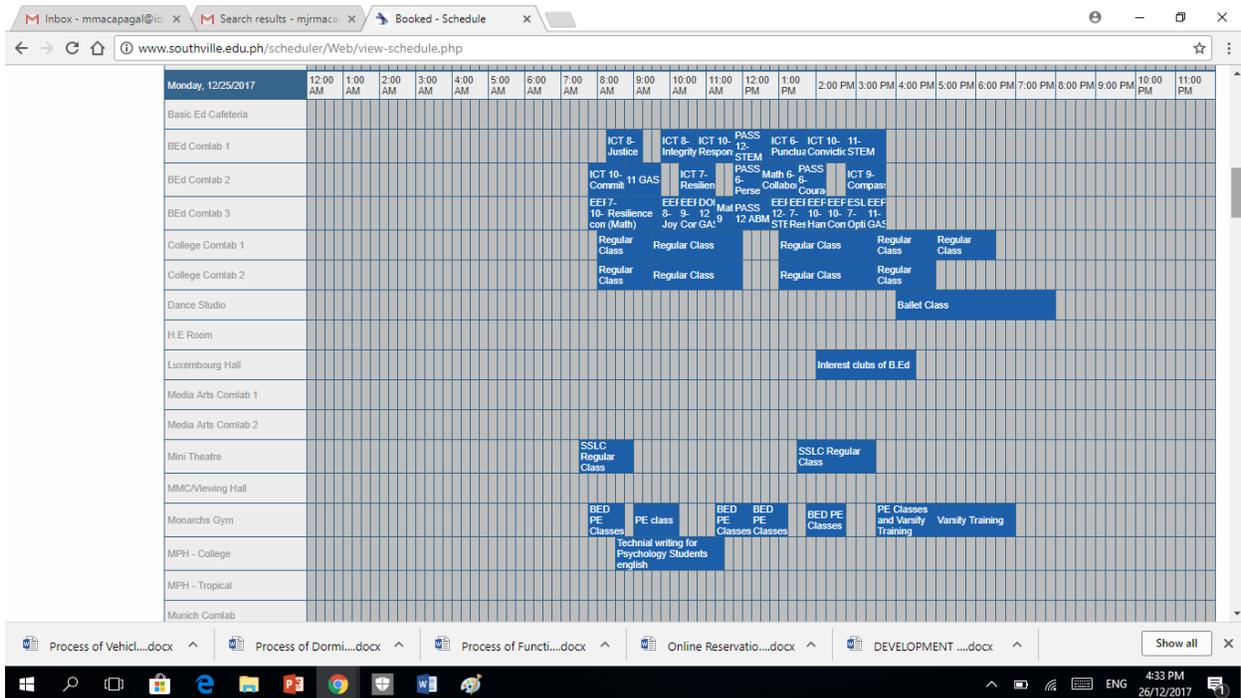


Figure 7: Screen shot of the Southville Scheduler with Data

4.1.6. Description of the TWC Online Reservation Technical Systems Requirements

This section describes the functional and non-functional requirements of the system, the data requirements, systems protocol, criteria for selection, and timeframe of development, testing, and training.

Functional and non-functional requirements: The term refers to a software engineering concept that shows and specifies what a system should be able to do to perform its functions. It is used to identify user requirements specifications in the software life cycle. It is a capability requirement that a product must have to make it function for the user. Some of the typical functional requirements are related to business rules, transaction corrections, adjustments and cancellations, administrative functions, authentication, authorization or the functions user is delegated to perform, audit tracking, external interphases, certification requirements, reporting requirements, historical data, and legal or regulatory requirements to name a few.¹⁷The non-functional requirements refer to specifications on how the system should behave, constrained upon the systems behavior. Typical non-function requirements involve performance, capacity, reliability, maintainability, security, manageability, data integrity, Interoperability, scalability, availability, recoverability, serviceability, regulatory, environmental and usability.¹⁸

The system requires the following to operate:

- Internet connection
- Web server and web space with valid URL
- Email address of clients
- System generated Reference code after using the system

For personal computers (PC) or laptops, the system can operate in the following:

- Operating System: Windows XP or higher/Mac-OS X – Leopard or higher/Linux (GUI Environment)
- Browser: Internet Explorer 10 or higher/Safari/Google Chrome ver 7.0.517 or higher/Mozilla Firefox ver 56.0.2 or higer

For Smart Phones, the system can operate in the following:

- Operating System: IOS, Windows or Android
- Browser: Internet Explorer/Opera/Google Chrome/Safari/Firefox

4.2. Systems Development

The TWC Online Reservation System is web-based application. Web applications are applications accessed by users over a network such as the Internet or the intranet. It may mean a computer software application that is coded in a browser supported programming language such as JavaScript, combined with browser rendered markup language like HTML and reliant on a common web browser to render the application executable.¹⁹The development of the system follows a release life cycle version which includes the:

- pre-alpha - requirements document, software design, and activities before testing;
- alpha - covers core application features but unstable;

¹⁷ Mark Kozak-Holland,2009 cited in Maria Macapagal 2013 published by APCICT Primer Series 2014

¹⁸ Ibid.

¹⁹ Norik Davtian, 2012 definition cited from Wikipedia retrieved 2012.

- beta version - the system may have complete set of features but some bugs are discovered and must be available only to controlled group of users with early access privilege to the system for the purpose of testing and feedback-
- release candidate version – system is stable, and no features will be added at this stage; the systems is available as an early preview to users for the purpose of identifying the last set of bugs in the system or understanding user behavior on a larger scale than the Beta user version. If user reviews are positive, the version could be published and may need publicity;
- Release versions may be stable but subject to further improvement, thus versions are numbered especially if there are major changes or new features added in the software.

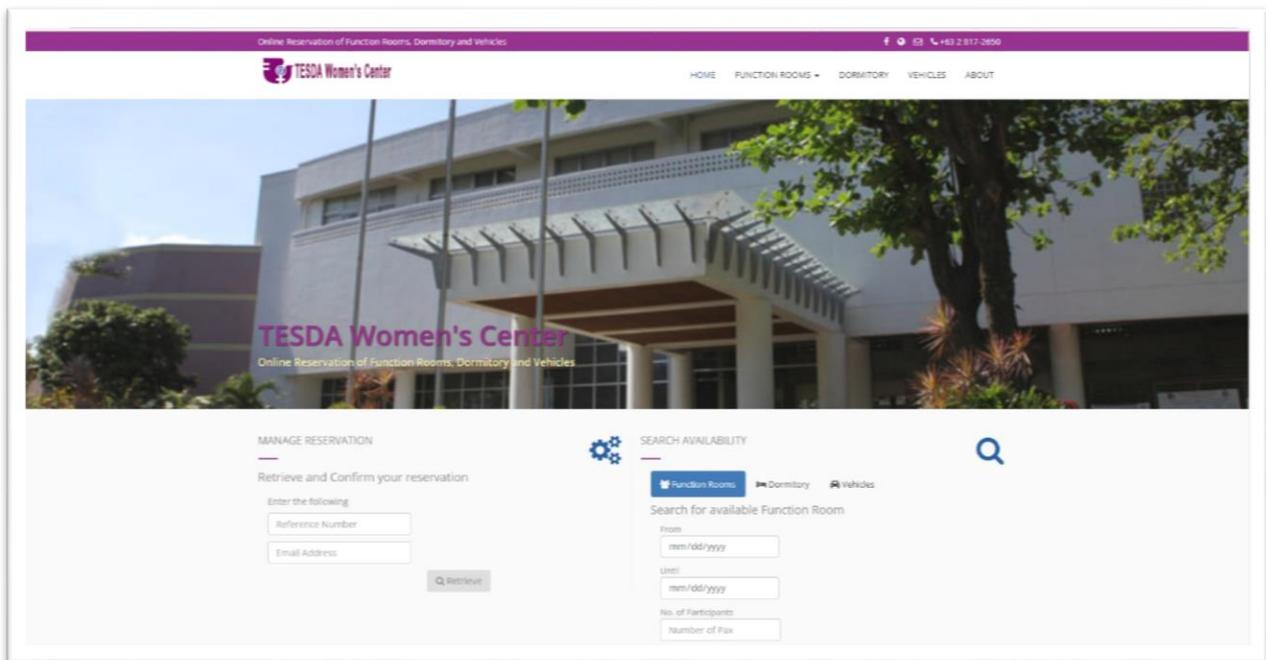
As of this writing, the reservation system application is still in the beta version.

4.2.1. The Home Page

Figure 8 shows the designed home page. Aside from the TWC Logo and photo of the building, it has featured the main menu options – the Home, the Function Rooms, the Dormitory, the Vehicles, and About (the application). Aside from the main menu the home page already directs the user to two major options: The Search Availability Option on the right side, and the Manage Your Reservation Option on the left side.

The Search Availability option provides the option of the facilities whether the function room or dormitory facilities or vehicles. The default however is the function room option. When option is chosen the date fields are for filling up; when it will be used in a time range (from and until). It has a drop-down option where the user can just click the choice dates. It also asks for the numbers of persons that will be attending and using the facilities.

Figure 8: TWC Reservation System Home Page Screen Shot



Zooming in the Function Room Search availability option, it also has time of event from start to end and the search button. When information is filled up and search button is pressed, the screen will be directed to the Function Reservation page (Figure 9).

SEARCH AVAILABILITY

Function Rooms Dormitory Vehicles

Search for available Function Room

From
12/27/2017

Until
12/29/2017

No. of Participants
25

Time of Event
08:00 AM Start
05:00 PM End

Search

Figure 9: Function Rooms Search Availability Screen Shot

The Reservation Details Page (Figure 10) provides a list of Function Room Options on the date of reservation. The page shows the time of the function, the function room, the capacity and if there is a scheduled activity on the said time. The page also shows the immediate succeeding date's schedule. Given the capacity and size of attending guests, the user may choose any of the vacant room by ticking the button. Once the vacant room is ticked, the page will be directed to the reservation blank field details for user accomplishment.

Reservation Details

Choose your preferred Function Room

December 27, 2017, Wednesday X

Time of Function: 08:00 - 17:00

	Function Room	Capacity	Schedule		
			Morning	Afternoon	Evening
<input type="radio"/>	Tandang Sora Hall Php 9,000.00	200 - 270	NORWEGIAN TRAINING CENTER by norwegian training center 08:00 am - 05:00 pm		Vacant
<input type="radio"/>	Marcela Agoncillo Room Php 3,000.00	50 - 70	SEMINAR ON ARTIFICIAL INTELLIGENCE by sdfgdafg 08:00 am - 05:00 pm		Vacant
<input type="radio"/>	Gregoria De Jesus Room Php 2,500.00	30 - 40	Vacant	Vacant	Vacant
<input type="radio"/>	Gabriela Silang Room Php 3,000.00	30 - 40	Vacant	Vacant	Vacant
<input type="radio"/>	Lecture Room 2 Php 2,800.00	20 - 30	Vacant	RESEARCH REPORTING by TWC 12:00 pm - 02:00 pm	Vacant
<input type="radio"/>	Lecture Room 3 Php 2,800.00	20 - 30	Vacant	Vacant	Vacant
<input type="radio"/>	Lecture Room 4 Php 2,800.00	20 - 30	Vacant	Vacant	Vacant

December 28, 2017, Thursday

Time of Function: 08:00 - 17:00

	Function Room	Capacity	Schedule
--	---------------	----------	----------

Figure 10: Reservation Details Page Screen Shot

The Reservation field details for accomplishment is the Title of Function. Type the title, and it will provide function room details as to the rate and estimated amount. Note that the Number of Participants, Date of Function and Time of Function fields are saved from previous accomplishments of the home page and availability page. The function room details page has another option that is the equipment request. The equipment for use is listed and by ticking the list and the quantity, it can provide you the estimated total amount if use is desired.

Title of Function

No. of Participants

Date of Function

Time of Function Start Time of Function End

FUNCTION ROOM DETAILS

	Date	Function Room	Room Rate
1	December 27, 2017, Wednesday	Gregoria De Jesus Room	PHP 2,500.00
2	December 28, 2017, Thursday	Gabriela Silang Room	PHP 3,000.00
3	December 29, 2017, Friday	Gabriela Silang Room	PHP 3,000.00
Function Room Rate			PHP 8,500.00

EQUIPMENT REQUEST

Optional

	Date	Equipment	Rate	Quantity
1	December 27, 2017, Wednesday	<input type="checkbox"/> LCD Projector	PHP 650.00	<input type="text" value="0"/>
		<input type="checkbox"/> DVD Player	PHP 500.00	<input type="text" value="0"/>
		<input type="checkbox"/> Whiteboard	PHP 200.00	<input type="text" value="0"/>
		<input type="checkbox"/> Sound System with 2 units of Microphone	PHP 500.00	<input type="text" value="0"/>
2	December 28, 2017, Thursday	<input type="checkbox"/> LCD Projector	PHP 650.00	<input type="text" value="0"/>
		<input type="checkbox"/> DVD Player	PHP 500.00	<input type="text" value="0"/>
		<input type="checkbox"/> Whiteboard	PHP 200.00	<input type="text" value="0"/>
		<input type="checkbox"/> Sound System with 2 units of Microphone	PHP 500.00	<input type="text" value="0"/>
3	December 29, 2017, Friday	<input type="checkbox"/> LCD Projector	PHP 650.00	<input type="text" value="0"/>
		<input type="checkbox"/> DVD Player	PHP 500.00	<input type="text" value="0"/>

Figure 11: Function Room Details and Equipment Request Summary Page Screen Shot

Zooming in the previous screen shot is the Equipment Request section described earlier.

RESERVATION DETAILS

Title of Function

No. of Participants

Date of Function

Time of Function Start Time of Function End

FUNCTION ROOM DETAILS

	Date	Function Room/ Equipment Requested	Rate
1	December 27, 2017, Wednesday	Gregoria De Jesus Room	2,500.00
		LCD Projector x 1 @ Php 650.00 per unit	650.00
2	December 28, 2017, Thursday	Gabriela Silang Room	3,000.00
		DVD Player x 1 @ Php 500.00 per unit	500.00
3	December 29, 2017, Friday	Gabriela Silang Room	3,000.00
		Total	PHP 9,650.00

CLIENT DETAILS

Figure 13: Reservation and Function Room Detailed Summary Screen Shot

On the same page of the Reservation Details appears The Client Details and Coordinator Details section has fields for accomplishments such as: Office/Organization, Address, Contact Number (for the Client Details) and the Name, Email Address and Contact Details for the Coordinator Details.

On the same page is the “Terms and Condition” link and button which has to be ticked before clicking the Submit Request box.

3	December 29, 2017, Friday	Gabriela Silang Room	3,000.00
		Total	PHP 9,650.00

CLIENT DETAILS

Office/Organization: TESDA Women's Center

Address: Gate 1 TESDA Complex, East Service Road, South Superhighway, Taguig City

Contact Number: 817-2650

COORDINATOR DETAILS

Name: Aries Glenn Montesines

Email Address: aglmontesines@tesda.gov.ph

Contact Details: 817-2650

TERMS AND CONDITIONS

I have read the Terms and Conditions

Figure 14: Client Details and Coordinator Details Summary Screen Shot

Once Submit Request is clicked the user will be directed to the Confirmation of Reservation page. This has the summary of all the details ticked and accomplished. A reference number is issued automatically. At the bottom of the Confirmation of Reservation page there is a note that says that this is not a Billing Statement. Also, once the request is submitted, the system will automatically send email message to the requesting party of the reservation request/ summary and reference number of the request.



TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

TESDA Complex, East Service Road, South Superhighway, Taguig City
NATIONAL CAPITAL REGION

TESDA Women's Center



ONLINE RESERVATION OF FUNCTION ROOMS

<http://twc.tesda.gov.ph/facilitiesreservation>

CONFIRMATION OF RESERVATIONS

TESDA Women's Center

Gate 1 TESDA Complex, East Service Road, South Superhighway, Taguig City
Attention: **Aries Glenn Montesines**

Your reservation of TWC's Function Room(s) has been confirmed.

Title of Event

TRAINEES ORIENTATION PROGRAM

08:00 - 17:00

No. of Participants

25

Reference Number



WS985D

Reservation Details			
	Date	Function Room/ Equipment Requests	Rate
1	December 27, 2017, Wednesday	Gregoria De Jesus Room	2,500.00
		LCD Projector x 1 @ Php 650.00	650.00
2	December 28, 2017, Thursday	Gabriela Silang Room	3,000.00
		DVD Player x 1 @ Php 500.00	500.00
3	December 29, 2017, Friday	Gabriela Silang Room	3,000.00
	Total		PHP 9,650.00

THIS IS NOT A BILLING STATEMENT

Figure 15: Confirmation of Reservation Page Screen Shot

At the home page, if the option required is the Dormitory, below is the screenshot of Search Availability for accomplishment of dates when room is needed, as well as the number of the

male guest, female guest, the type of room required. Tap the search button and the user will be directed to the Dormitory Page.

The screenshot shows a search interface titled "SEARCH AVAILABILITY". At the top, there are three tabs: "Function Rooms", "Dormitory" (which is highlighted in blue), and "Vehicles". Below the tabs, the text "Search for available room/s" is displayed. There are two date input fields, each with a calendar icon and the placeholder "mm/dd/yyyy", separated by the word "to". Below the date fields are two input fields for the number of guests, labeled "No. of Male Guests" and "No. of Female Guests", each with a person icon. Underneath, there is a section titled "Type of Room" with two radio button options: "Airconditioned Room" (selected) and "Regular Room". At the bottom left, there is a "Search" button with a magnifying glass icon.

Figure 16: Search Availability Dormitory Screen Shot

Back to the Home Page, if the option required is the Vehicle, below is the screenshot of Search Availability for accomplishment of date and time when the vehicle is needed, as well as the location for pick up and the destination. Tap the search button and the user will be directed to the Vehicle Reservation Summary Page.

Figure 17: Vehicles Search Availability Page Screen Shot

Figure 18: Sample – Filled-in Vehicle Search Page Screen Shot

The TWC Vehicle Reservation Page provides the summary of the date (highlighted) when needed, the vehicle type, the time of departure and destination. Note that the latter shows a map and the distance from the point of pick-up to destination. Further it has a remarks section

whether the option is only for drop off, for driver to wait, for pick up and return. If the summary details are correct, click the Submit Reservation button to direct the user to the Client and Travel field details for the user to accomplish.

TWC VEHICLE RESERVATION

27-Dec-2017 Wednesday | 28-Dec-2017 Thursday | 29-Dec-2017 Friday | 30-Dec-2017 Saturday | 31-Dec-2017 Sunday | 01-Jan-2018 Monday | 02-Jan-2018 Tuesday

**December 27, 2017
Wednesday**

Vehicle	Departure	Destination	Remarks
Toyota Hilux Plate No.: SEW 846 Capacity: 4	09:00	DICT Distance: 0 Kilometer(s) Estimated Travel Time: 0 minutes Requested by: Lucy Tabu Research TWC	Drop-off, Wait, Pick-up and Return

Submit Reservation

Figure 19: TWC Vehicle Reservation Summary Page Screen Shot

The Vehicle Request page provides fields to identify the Requesting Office, Travel Details, the Terms and Conditions and the Submit the Request Button. Once the request is submitted, the system will automatically send email to the requesting party of the reservation request/summary and reference number of the request.

REQUESTING OFFICE

Requesting Office	TESDA Women's Center
Division/Unit	Finance and Administrative Support Services Unit
Contact Person	Aries Glenn L. Montesines
Contact Number	817-2650
Email Address	aglmontesines@tesda.gov.ph

TRAVEL DETAILS

Date of Travel	2017-12-27
Origin	TESDA Women's Center
Destination	Landbank - FTI, Taguig
Departure	10:00 AM
Purpose	Purpose of Travel
No. of Passengers	4

Drop-off Only
 Drop-off, Wait, Pick-up and Return
 Pick-up and Return

TERMS AND CONDITIONS

I have read the Terms and Conditions

Figure 20: Vehicle Submit Request Page Screen Shot

4.3. Challenges encountered

The challenges encountered in the development process or actual implementation, and during the testing and training are as follows:

- In benchmarking only two institutions were able to respond to the visitation request and the disclosures about the systems developed. This limited the choices of the developer's to assess the best prototype that can be more useful to the TWC.

- The action research should have been treated as a project which requires focus due to the constraints of scope and time. Documentation of the research is also limited since it is dependent on the systems developer's inputs and outputs.
- The role of the developer is critical to the research project. The systems developer required more time to develop the system because of other work responsibilities in the organization. The developer is also the systems administrator of the TWC. Although he was given some leeway to schedule work responsibilities, the research work also demanded time and effort since actual implementation timeline was only for four months. Capacity and experience of the developer is still limited in e-Government perspectives and ICT for Development project management.
- The process owners need to be involved from the start of the project. While process owners were consulted in the charting of the business processes, the personnel fully involved in the research was not enough for the demanded output for the project.
- The systems at this point is still limited and may not be able to accommodate other clients or users outside of the TWC and TESDA Central, and NCR.
- Maintenance of the system requires more detailed planning and budgeting.
- There is a need to include change management in the detailed plan of the research process and systems development.

In the actual user testing activities, the process owners' and users' impressions and feedbacks are mostly in the actual usage of the system.

4.4. Future Plans

The maintenance and transactional features of the systems are one of the major plans for the systems expansion and upgrading. Aside from the technical work and design, the systems require involvement of process owners and more training of users.

Chapter 5: Conclusion and Recommendation

This chapter provides the conclusion and recommendations of the study. It answers the main and specific research questions posed in the inception report. The objectives of the study is to assess the system design that is most useful and appropriate for TWC in the reservation and monitoring of occupancy and usage of its facilities.

5.1. Conclusions

To answer the question, “What systems approach and design is proven effective to TWC use?” answers to specific questions were undertaken. Criteria is established for assessment main covers two general criteria and that is simplicity of the system and cost beneficial to the TWC. Criteria setting is relevant to the action research study. The list of criteria includes the definition of functional and non-functional requirements of the system. The study concludes that the systems design must consider and include the critical success factors of any e-Government systems applications such as:

Table 3: Critical Success Factors and Assessment of TWC systems approach

<i>Critical Success Factors</i>	<i>Assessment</i>
<i>External pressure</i> - Driver for reform from outside government, e.g. from civil society	The Ambisyon 2020 and the seal of Good Housekeeping promoted by the previous and current administration
<i>Internal political desire</i> -Driver from key government officials for reform and for achievement of e-Government goals	The TWC leadership believes in the principles of good governance and gender mainstreaming as well as provides the direction for this action research allocating time and resources for the research.
<i>Overall vision and strategy</i> - Overall vision and master plan for good governance and for e-Government, identifying 'where we want to get to', seeing IT as the means not the end, and integrating IT with broader reform objectives	The TESDA Roadmap provides the outcomes and strategy that includes the promotion of good governance system and the Strategies of establishing ICT-enabled systems for e-TESDA and the development of techvoc information systems.
<i>Effective project management</i> - Including the use of rigorous process of development and identification in consultation with stakeholders, the use of PM methodologies to ensure results and benefits to government, beneficiaries and stakeholders.	The research rationale and framework in itself promotes the ideals of project management. It is a start to model the promotion of effective project management. The process of identifying the criteria in consultation with stakeholders and beneficiaries marks the initial desire of moving towards good governance principles.
<i>Effective change management</i> - Including leadership with a project champion, use of incentives to create commitment to and ownership of e-gov project, and stakeholder involvement to build support and minimize resistance	Champions are present at the TWC; these are officials, section and department heads who are involved in the project. There is a need to build this further among other staff when the systems are rolled out and expanded.
<i>Effective design</i> - An incremental/piloting approach with feasible objectives and quick,	The framework promotes the incremental and pilot approach to systems development.

scalable outcomes; participatory involvement of all stakeholders, leading to designs that meet real user needs and match real user contexts.	Likewise, there is an attempt to involve stakeholders in specifically the leadership, process owners, and users in the process.
Requisite competencies - Presence of the necessary skills and knowledge, especially within government itself; need both management and IT skills and knowledge	The research is one of the attempts to build competencies in the institution specifically in the Research and Development section of the TWC.
Adequate technological infrastructure - Presence of the necessary skills and knowledge, especially within government itself; need both management and IT skills and knowledge	There is some presence of the skills and knowledge in management and IT, nevertheless there is still a need to build capacity (competency) among the TWC staff. In the IT section, the fact that the decision to build the systems in house provides some level of confidence in the IT skills of the staff.
Adequate Fund - Source of fund to initiate, implement and sustain e-Government Solutions framework.	The TWC is aware that they will need to allocate funds for maintenance and expansion of the systems initially developed. There is still a need to invest in infrastructures and capacity at the TWC.

1. Rationale of reservation systems development and use of a system to monitor reservation and use of its facilities. The development of the system underscores the following articulated in the objectives:
 - To reduce the workload of staff needed to manage the scheduling of the facilities and vehicles;
 - To improve customer service by using ICT resources
 - Improve communications
 - Eliminate scheduling conflicts;
 - Save time and eliminate long process of making a request
2. Process of the TWC development of the system. The TWC IT Administrator and Research and Development sections conducted benchmarking of similar systems in other jurisdictions specifically the Southville International and the University of the Philippines. They also used the in-house procurement of services where the systems developer is also the TWC IT Administrator. Furthermore, the Research Team held consultations with sponsors and process owners of the room, dormitory and vehicle reservations.
3. Criteria used in the program selection of and development of the system. Criteria is established for assessment main covers 2 general criteria and that is simplicity of the system and cost beneficial to the TWC. Criteria setting is relevant to the action research study. The list of criteria includes the definition of functional and non-functional requirements of the system. The study considers and include the critical success factors of e-Government systems applications in the assessment.
4. Business process activities undertaken to ensure efficiency and cost effectiveness. Analysis of the business process for the reservation systems were conducted. Cost effective analysis was also undertaken. The results were validated in the consultation processes with process owners and users as well as the TWC leadership.

5. Results of the testing and training of the new system. The feedback of process owners and users of the system were mostly on the actual usage of the system.
6. Future plans for the system. The maintenance and transactional features of the systems are one of the major plans for the systems expansion and upgrading. Aside from the technical work and design, the systems require involvement of process owners and more training of users.

5.2. Recommendations

- **For the TWC Leadership**
 - Continue championing and promoting research and development as well as building the capacity of the TWC by engaging the staff and trainers to participate and develop systems that will increase efficient and effective delivery of services – at the finance and administrative sections and operations sections.
 - Allocate resources for the maintenance, expansion and roll out of the systems proven to be efficient and effective to the TWC. Specifically, provide additional staff who will focus on the maintenance, expansion of the systems and establishment of help desks for the use of these systems.
 - Support innovative approaches to systems development and promotion of information systems.
- **For the IT Administrator/Developer**
 - Improve systems development approach through effective project management
 - Conduct regular consultations with process owners and users, and external resources such as ICT applications specialists for improving, upgrade, expansion, and roll out of the systems.
- **For the Research and Development Section**
 - Continue to conduct researchers to ensure innovation and improvement of the techvoc courses and information systems
 - Support and promote the utilization of the research findings and recommendations.
- **For the Process Owners and Users**
 - Help and support the IT administrator and staff, as well as the Research and Development personnel in promoting innovation and creation efficient and effective systems for the TWC

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