Chapter 3

RESEARCH METHODOLOGY

This chapter defines the research methods and procedures used to conduct the study. The methodologies will include areas such as Methods of Research, Research Instrument and Technique, Data Gathering Procedure, Statistical Treatment of Data, Development Flowchart, Data Flow Diagram, Entity Relationship Diagram, System Flow Chart, Use Case Diagram, Grant Chart.

3.1 Methods of Research

This study employs quasi-experimental method under quantitative research design. Johnson RB (2017) stated that, “Mixed methods research (“Mixed Methods” or “MM”) is the sibling of multimethod research (“Methodenkombination”) in which either solely multiple qualitative approaches or solely multiple quantitative approaches are combined.”

3.2 Respondents

The respondents of the study will be the community of the Research and Extension. This includes students, professors, staff/faculty members of the Technological University of the Philippines Taguig. These respondents are substantial to the study considering their knowledge in science and technology. The prepared survey questionnaires for the respondents will determine the effect of the integrated features to the system application and determine the oversight errors which are useful for the enhancement and development of the system.

3.3 Research Instrument

The researchers used survey questionnaires for collecting data. This data collection method enables the researchers to gain a relevant amount of information from a sample size in a short period of time.

A survey is one of primary methods for data collection. Survey involves questionnaires to be answered by the respondents, this can be through paper form or online. This method provides a low-cost and efficient way of collecting data. The survey used closed ended questions since the research is under the quantitative research design.

3.4 Data Gathering Procedure

The researchers employed survey questionnaires on students, professors and staff/faculty members at Technological University of the Philippines-Taguig as method collecting data. This data will be used to validate the effectiveness of the integrated features to the systems user-friendliness and its ease of access to the users. The data collected will be beneficial for the researchers.

3.5 Sources of Data

The primary sources of data were the results gathered from the survey issued to the respondents, specifically to the community of the Research and Extension. Websites, Journal, Articles were considered as secondary sources of data.

3.6 Locale of the Study

The study was conducted at Technological University of the Philippines-Taguig. The chosen respondents will provide significant data that will be beneficial to the researcher's development and the enhancement of the system.

3.7 Statistical Treatment of Data

The data collected from the respondents will be analyzed and summarized by the researchers. The researchers used mean and standard deviation as statistical tools to analyze results from the questionnaires that used Likert scale.

Mean

The following formula will be used to calculate the mean.

$$\bar{x} = \frac{\sum x_n}{n}$$

Where:

$\bar{x}$ is the sample average of variable x.

$\sum xn$= sum of n values.

n = number of values in the sample.

Standard Deviation

The following formula will be used to calculate the standard deviation.

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Where:

$\bar{x}$ = sample mean.

xi = sum of n values.

n = number of values in the sample.

3.8 Project Development

3.8.1 Modeling Tools

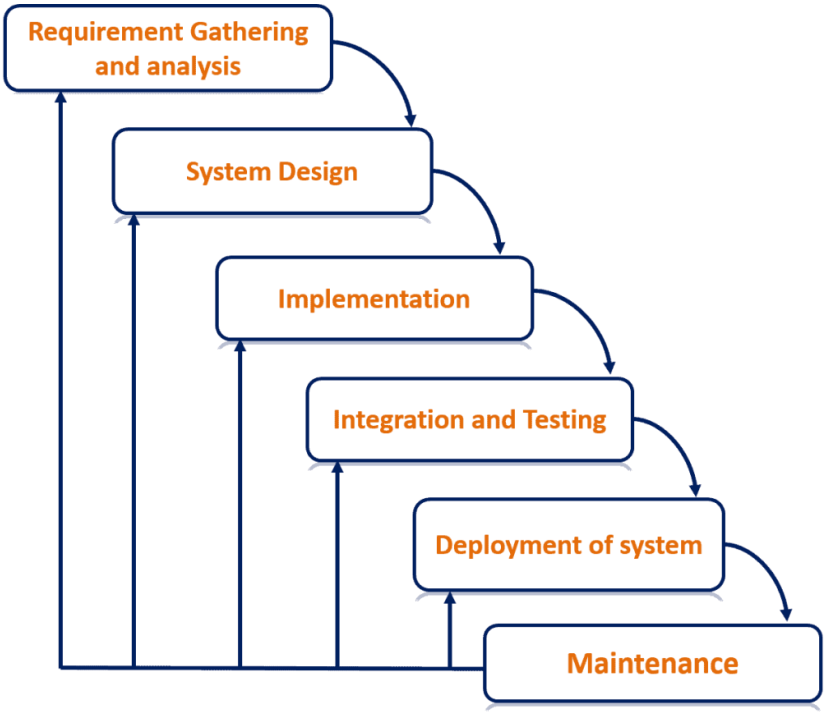

Figure 1. System Waterfall Model Approach

The researchers used Waterfall Software Development Life Cycle Model as shown in Figure 1. The waterfall model allows the researchers to accomplish stages of the system one by one, emitting mistakes that may occur due to the insufficient management of the project. This software development life cycle model also enables the researchers to carefully develop each phase before proceeding to the next phase if the previous phase is successfully accomplished.

3.8.2 Development Flow Chart

3.8.3 ERD Diagram

3.8.4 Use Case Diagram

3.8.5 Data Flow Diagram

3.8.6 System Flow Chart

3.8.7 Gantt Chart