P O L Y T E C H N I C U N I V E R S I T Y O F T H E P H I L I P P I N E S

e-Reklamo: A Complaint Management System
using Naive Bayes Algorithm

A Research

Presented to the Faculty of the

Polytechnic University of the Philippines

Quezon City Branch

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science in Information Technology

By

Gariando, Edmark R.

Las, Dominique L.

Marquez, Mark Christoffer D.

Yamat III, Hipolito V.

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By the Author:

Gariando, Edmark R.

Las, Dominique L.

Marquez, Mark Christoffer D.

Yamat III, Hipolito V.

ADVISER NAME

Research Adviser

Assoc. Prof. Demelyn E. Monzon

Research Professor

Polytechnic University of the Philippines – Quezon City Branch

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Group members:

Gariando, Edmark R.

Las, Dominique L.

Marquez, Mark Christoffer D.

Yamat III, Hipolito V.

Adviser:
Prof. Demelyn E. Monzon

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OTHERS:

Chapter 1

THE PROBLEM AND ITS BACKGROUND

Introduction

The evolution of technology has changed people's way of life. People can now readily interact, exchange information, and collaborate worldwide via websites, e-mail, instant messaging systems, social networking sites, and other internet-based communication tools. It significantly impacts academic growth and educational development of the students, and from many problems in the academic environment to create a social and practical educational system. Academic development is essential in an educational context because it supports social and practical learning systems. If an effective educational system is established, school officers must address the issue of the University's complaints management system.

Effective Complaint Management is essential for any organization that values customer satisfaction and retention. Organizations can improve customer loyalty and build a positive reputation by promptly addressing customer complaints and working to resolve them to the satisfaction of the customer. In contrast, neglecting customer complaints or failing to address them adequately can lead to customer dissatisfaction, ultimately resulting in a loss of business.

Positive relationships among students, parents, and school officials are essential for achieving and maintaining the highest educational outcomes. However, school officials are only sometimes optimal in carrying out their duties in school. It encourages the public to offer feedback or concerns so that school officials can enhance their services. Schools usually provide a platform for the public to make concerns, either directly through the complaint service counter or indirectly through the complaint officer's contact number.

Background of the Study

Childhood bullying is a significant public health issue that raises the risk of negative health, social, and academic outcomes in childhood and adolescence. All parties involved in bullying—bullies, victims, and bully-victims—experience these negative effects.

All kids should be protected in safe schools from dangers such as bullying, use of illegal substances on school property, exposure to weapons and threats, theft, violence, and other situations. Improved student and academic performance are related to school safety. Academic achievement is specifically correlated with emotional and physical safety at school. Students who experience physical or mental harassment run the risk of having low attendance, failing their courses, and dropping out of school.

The student and faculty members' problems experienced by each University are different, so each complaint/report submitted varies. Therefore, the first step of the complaint resolution process is classifying every complaint. It is intended to make complaint handling more effective and efficient. Classifying each complaint or report that comes in is undoubtedly a big task, especially if many of them come in simultaneously. Unfortunately, this can lead to less efficient performance for complaint management officers. As a result, it is required to automatically classify complaint reports so that the process becomes more accessible, faster, and more precise, making complaint management officers' performance time more efficient. This can be accomplished by employing machine learning approaches or a particular algorithm.

One of the main advantages of Naive Bayes is its simplicity and ease of implementation, making it a common choice for many classification tasks. It is also relatively fast and efficient, making it suitable for use in real-time applications. However, there are significant drawbacks to Naive Bayes. One of the key drawbacks is that it assumes feature independence, which indicates that the presence or absence of one characteristic does not affect the presence or lack of another. This can occasionally result in less accurate results than alternative algorithms that do not make this assumption.

In this study, the Naïve Bayes Classifier algorithm is used to classify complaints/reports. Naïve Bayes Classifier is a simple algorithm but can classify with high accuracy. Moreover, Naïve Bayes Classifier is known to have a degree of accuracy and works better than other classifier algorithms.

Theoretical Framework

Rawlsian Justice Theory

Rawlsian justice theory, commonly known as justice as fairness, is a political philosophy founded by philosopher John Rawls. The theory is founded on the premise that a fair society is one in which all citizens' basic rights and freedoms are respected, and in which the distribution of economic and social goods is ordered to benefit the least advantaged members of society. Rawls contends that a fair society is one in which the laws and institutions are decided behind a "veil of ignorance," in which individuals are unaware of their class, race, gender, natural assets, and abilities. This thought experiment is intended to ensure that the concepts of justice are chosen impartially, without favoritism.
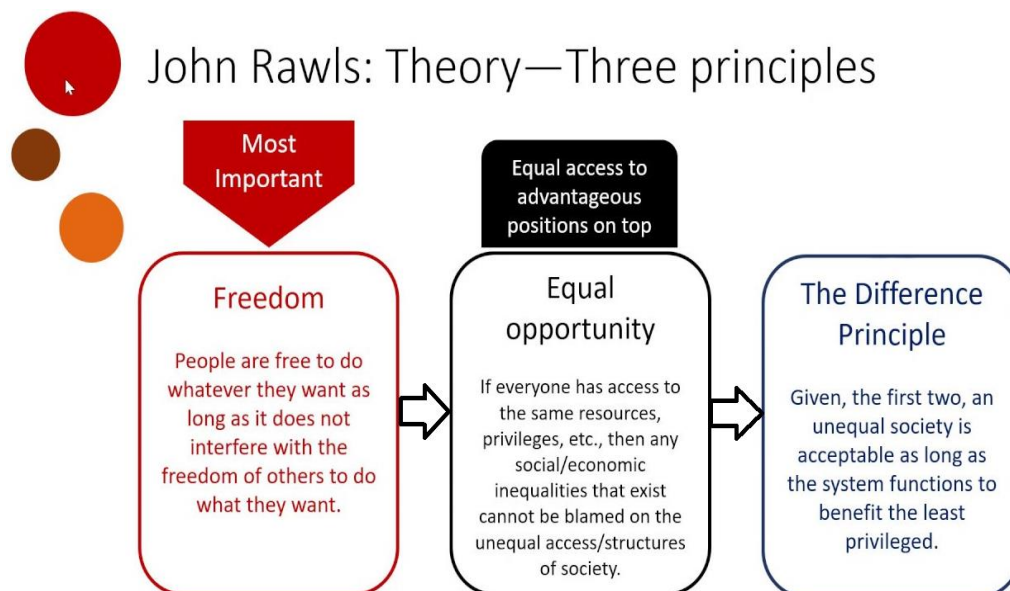
*Figure 1: **Rawlsian Justice Theory***

Digitalization Theory

The "digitalization of complaint theory" refers to the application of principles of social justice and fairness in the digital realm, particularly in the context of online interactions and the use of technology. This can include issues related to privacy, access to information, and the distribution of digital resources and opportunities. One aspect of the digitalization of complaint theory is addressing the "digital divide," which refers to the unequal distribution of access to technology and the internet.

It also includes ensuring that marginalized communities have access to affordable internet and devices. Another aspect of the digitalization of complaint theory is addressing online harassment and hate speech, which can disproportionately affect marginalized groups. This can include developing policies and tools to moderate online content and ensure that everyone can participate in online communities safely and free from discrimination.
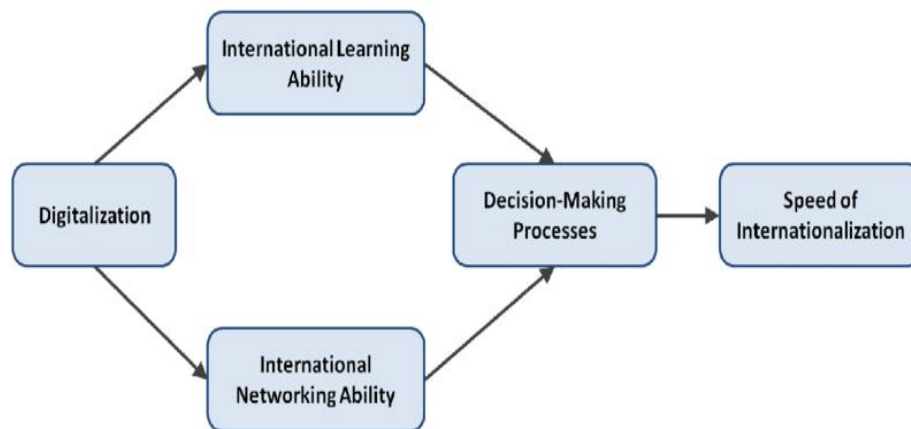
*Figure 2: **Digitalization Theory***

Technology Acceptance Model

The TAM (Technology Acceptance Model) is a theoretical framework that describes how people acquire and use technology. According to the paradigm, two important aspects influence a person's acceptance and usage of technology: perceived usefulness and perceived ease of use.
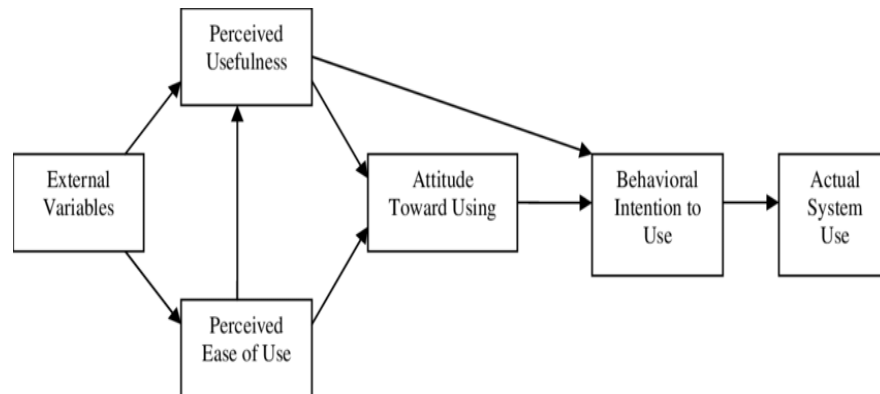
*Figure 3: **Technology Acceptance Model Theory***

Conceptual Framework

Based on the theories and models that are presented above, the conceptual framework is developed. The Input-Process-Output Model was used to conceptualize the model of the general system.
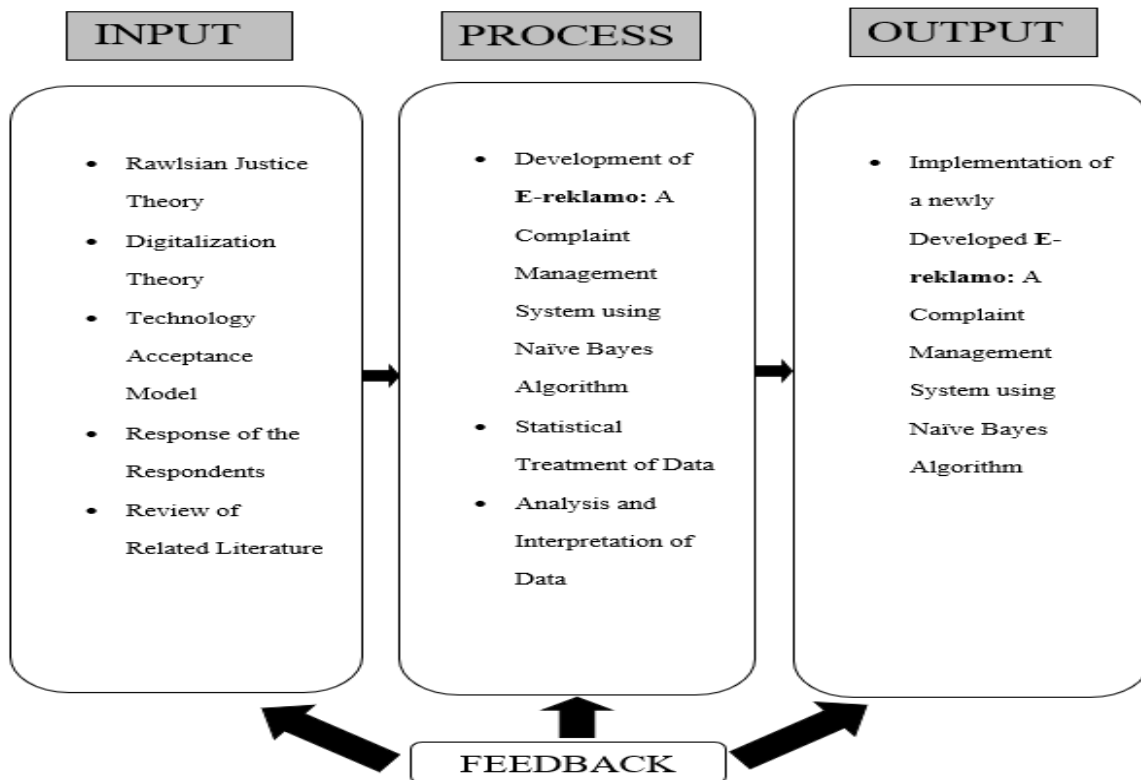
*Figure 4: **Conceptual Framework***

The Input in the Conceptual Framework consists of three theories such as Rawlsian Justice Theory, Digitalization Theory, and TAM Model. It is also having a response from the respondents which are the students, faculty members and department heads/administrators. The Review of Related Literature which is also considered to serve as a guide in conducting this kind of study.

For the Process, the researcher will develop a Web-based Complaint Management System using Naive Bayes Algorithm. After the development, the researcher will conduct and evaluate the data that is being gathered from different respondents. These procedures will be done to obtain the target outcome of the study.

And lastly for the Output, the researcher will implement the newly developed **eReklamo:** A Complaint Management System using Naive Bayes Algorithm.

Statement of the Problem

The research entitled *"e-Reklamo: A Complaint Management System using Naive Bayes Algorithm"* aims to evaluate the main problems and challenges that are being experienced by students. The researcher seeks answers on the following questions:

1. What are the benefits of using a complaint management system in a university?

2. What is the level of awareness of the respondents on monitoring complaints inside the university in terms of:

   a. Incident Report

   b. Familiarity with School Policies

   c. Immediate Reporting

   d. Response Time

3. What is the level of satisfaction of the respondents in the newly developed app "Complaint Management System" in terms of:

    a. Functionality

    b. Ease of use

    c. Usefulness

    d. Security

4. Is there a significant difference between the level of awareness and the level of satisfaction in the newly developed app "Complaint Management System"?

5. What are the possible recommendations to further improve the Complaint Management System?

Hypotheses

The null hypothesis of this study is as follow:

H_0: There is no significant difference between implementing a Naïve Bayes Algorithm in a Complaint Management System.

The alternative hypothesis of this study is as follow:

H_1: There is a significant difference in using Naïve Bayes Algorithm in a Complaint Management System.

Scope and Limitation

This study focuses on the implementation of the newly developed Complaint Management System to easily classify complaints from university personnel, including students, faculty, admin, etc. into predefined categories such as discrimination, academic issues, facility issues, and other safety concerns.

The respondents for this study are the people at the Polytechnic University of the Philippines - Quezon City Branch. Survey Questionnaire through Google Forms is the research instrument that is being used by the researcher to gather the necessary information needed in this study.

For the software development, the researcher will use the following: HTML, CSS, and JavaScript to conduct the front end of the system, while MySQL and PHP will serve as the back end of the proposed system.

Significance of the Study

The result of the study will benefit the following:

For Students. It can lead to improved problem-solving and resolution of issues, which can help to create a more positive and effective learning environment.

For Parents. It can provide a sense of trust and confidence in the school's ability to handle issues, which can lead to greater engagement and involvement in the educational process.

For Faculty Members. It can help increase their satisfaction in the workplace by addressing their issues.

For School Administrators. It can help to identify and address problems early on before they escalate, which can save time and resources. It can also improve the overall culture and climate of the school by creating a more open and responsive environment.

For Future Researchers. It can provide valuable data and insights about the issues and challenges that students, parents, and administrators face in the educational system. This can inform and guide future research, policy, and practice in the field of education.

Definition of Terms

To comprehend the words easily that the researcher used in the study, it is better to understand the different terms.

COMPLAINT - A statement that a situation is unsatisfactory or unacceptable.

THEFT - The action or crime of stealing.

ALGORITHM – It is a procedure used for solving a problem or performing a computation. Algorithms act as an exact list of instructions that conduct specified actions step by step in either hardware- or software-based routines.

NAIVE BAYES ALGORITHM - It is one of the simplest and most effective Classification algorithms that can make quick predictions. It is a probabilistic classifier, which means it predicts based on the probability of an object.

HYPERTEXT MARK-UP LANGUAGE (HTML) – A standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.

CASCADING STYLE SHEET (CSS) – CSS is used to style and layout web pages to alter the font, color, size, and spacing of your content, split it into multiple columns, or add animations and other decorative features.

JAVASCRIPT – A dynamic programming language that's used for web development, in web applications, for game development, and lots more. It allows you to implement dynamic features on web pages that cannot be done with only HTML and CSS.

MySQL – A vast amount of information in a corporate network to add, access, and process data stored in a computer database, you need a database management system such as MySQL Server.

PHP (**Hypertext Preprocessor**) - is a popular server-side scripting language primarily used for web development. It is a powerful and versatile language that is designed to be embedded within HTML code and executed on a web server. PHP code is processed by the server, generating dynamic web pages that can be sent to the client's browser for display.

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter provides the supporting details and information to fully understand the research. The researcher will present the relevant literature, studies, synthesis, and systems that the researcher used to strengthen the study.

RELATED LITERATURE AND STUDIES

Complaint Management

A literature review provides a summary and explanation of the entire and current state of knowledge on a particular topic as contained in academic books and journal articles. A complaint is a negative expression of a dissatisfied customer or consumer about the product, services, and organization's action. According to Kumar & Kaur (2019). It is an action taken by a dissatisfied individual, which involves communicating something unwanted or unacceptable regarding a product or service. It defines complaints as an attempt by the customer to change the unsatisfactory purchase experience. Complaint management is the process and procedure by which companies systematically handle customer problems.

This phenomenon is crucial because organizations have never taken complaints seriously and have always discouraged customers from filing complaints, causing further distress and discontent (Stauss & Seidel, 2019). Eventually by creating a complex system of complaint registering and handling dissatisfied customers. Customer complaints have increased in recent years due to the influence of social media. Lovely Singh Bhadouria, et. al. (2021) stated that a Complaint Management System is a modern product development tool that is widely used by all businesses and management. It offers an online solution to the public's problems, saving time and eliminating wrongdoing. The goal of the complaint management system is to make it easier to coordinate, monitor, track, and handle complaints.

According to Advocacy Research (2021), it is essential to register complaints before they can be managed. When you have a complaint, it is necessary to obtain the specifics and produce evidence when possible. According to Kolsky's data, most complainants either keep their dissatisfaction issues bottled up or discuss them with other individuals who may become disappointed. According to Surbhi (2018), management is the process of managing and controlling the operations of an organization, regardless of its form, kind, structure, or size. It is the act of creating and sustaining an atmosphere in which people of a company may collaborate and achieve business objectives efficiently and effectively.

We can define Complaint Management as the process of regulating concerns of dissatisfaction or unhappiness voiced by complainants. Complaint management allows for the effective handling and control of issues raised by complainants. Management guides a group of people working in an organization, directing their efforts toward a common purpose (Surbhi, 2018). It is quite difficult to understand what someone is thinking. It is possible that most individuals are content with your services, but some of them are not. Therefore, it is essential to create a functional complaint management system that ensures good rapport with the people. Complaint management requires the development of methods, as well as the determination of where complaints should be received, how to respond to input, and which departments or individuals the criticism should be delivered to (IONOS, 2019).

An effective Complaint Management System is essential for offering good complainant service. It assists in the measurement of complainant satisfaction and serves as a valuable source of information and feedback for service improvement. Complainants are frequently the first to notice when something isn't working properly (Ombudsman, 2020). Furthermore, it is worth noting that Complaint Management Systems are extremely important in organizations where complainants are prioritized because they help to understand what complainants are thinking, establish more friendship between administrator and complainant, and, most importantly, ensure maximum complainant satisfaction. The database in Complaint Management Systems keeps track of complainant

records and complaints. This can be used to improve the relationship between the complainant and the admin. Poor service organizations, according to Stone (2019), are difficult to conduct business with. They developed a complaint management system that can minimize customer dissatisfaction and encourages customers to participate in controlling the quality of the service provided.

The system's goal was to make complaints easier to organize, monitor, manage, and address, as well as to offer organizations an effective tool for keeping records of complaint data and using data to identify problem areas and improve service. The system includes two modules: one for the user and one for the administrator. As a result, the system has a client-server relationship. Each user has a distinct identity, which is represented by the user email ID.

Student Complaint Behavior

Universities are dealing with growing competition and declining enrollments, forcing higher education officials to look within to improve students service standard (Pavlov, 2020). According to DeSeCo, higher education institutions are dealing with a changing student culture, which is shown in part by a more consumer-minded student. Institutions, in general, attract a diverse group of students with a wide range of interests, experiences, and aspirations. When these expectations are not satisfied, today's students are more effective and smarter than their predecessors in filing complaints.

With increased enrollment competition, managing student satisfaction has become a great concern. Dissatisfied students, like those in most professional situations, have a variety of options and tools at their disposal, some of which can be detrimental to the university. When students file a complaint with an institution, the information gathered should be regarded as incredibly valuable data that can benefit the business (Collaborator, 2022).

In recent years, there has been a greater emphasis on the emotions that students experience when conflicts arise (Valente & Lourenco, 2020). According to Heath, H., and

R. G. Smith. (2019) When confronted with conflict or a general lack of communication, students may exhibit a variety of behaviors. When attempting to address a dissatisfying student experience, students may seek the assistance of a third party or pursue more legal procedures. These acts must not only be addressed, but their core causes must also be understood. Service failures can have a wide range of managerial consequences for academic leaders. There is an urgent need to understand how students react to negative events. This will ultimately help to provide students with the best positive experience, which is becoming an emphasized focus in a service setting like education, where students evaluate intangible services over time (Sutherland, 2018).

According to Yuke (2018), complaints that include external factors are sometimes the most difficult for institutions to handle. These practices can result in the student avoiding the institution, frustrated word-of-mouth talks, or complaints to outside agencies. Institutional expenditures related to complaints include the loss of one or more students as well as additional income loss to cover the cost of maintaining the student and the labor cost of dealing with the complaint itself (Garcia & Weiss, 2020). These occurrences can also provide important information, such as the reasons for a downturn in school performance, the root causes of these conflicts, and an awareness of the genuine expenses connected with managing complaints (Garcia & Weiss, 2020).

Academic leaders must be more straightforward about their intention to promote conflict resolution among students. This allows the institution to resolve challenges and develop long-term relationships (Keibel, 2021). There is widespread agreement that students are increasingly considering themselves as customers and aligning with the expectations of other service users. Satisfaction ratings with the student's experience focus attention and have been linked to students' post-consumption attitudes toward education in general. Student conflict and complaint behavior has evolved into a sophisticated relationship component with a greater emphasis on the student experience (Gamage, Dehideniya, Ekanayake, 2021).

Fairness and Loyalty as a Theory

Fairness and loyalty, as a theory, represent fundamental moral principles, as expressed in developmental and evolutionary approaches to moral cognition. Infants support both distributive and retributive justice. According to Carpenter & Bradley (2018) student communications, outlooks, and actions are influenced by the perceived service they receive. For example, when an institution properly communicates with a student about a topic, it can positively influence the outcome. When students view a proposed settlement to be a forced procedure, they will make more self-serving decisions rather than being more susceptible to compromise (Carpenter, Bradley, 2018; Khan et al., 2020).

If the student believes that more attractive options are accessible, they are inclined to escalate the situation. In the views of the student, an unfair decision puts into question the perspective of students, as consumers of education that are normally supposed to maintain (Khan et al., 2020). If the communicated explanation/resolution contains a perceived excuse or appears to justify a particular point of view, it can influence the entire process in either way. The more efficient and effective the communication process, the more likely the student will see conflict resolution as the sole realistic solution (Carpenter, Bradley, 2018; Khan et al., 2020).

SYNTHESIS OF THE REVIEWED LITERATURE AND STUDIES

A complaint is a negative expression of a dissatisfied customer or consumer about the product, services, and organization's action. It is also proof of customer dissatisfaction. Customer complaints have increased in recent years due to the influence of social media. The simplest definition of a complaint is 'it is a statement that something is unsatisfactory or unacceptable.

The Complaint Management System is a modern product development tool that is widely used by all businesses and management. It offers an online solution to the public's problems, saving time and eliminating wrongdoing. The goal of the complaint management system is to make it easier to coordinate, monitor, and handle complaints.

Chapter 3

RESEARCH METHODOLOGY

In this chapter, it discusses the Research Design, Research Instruments, Data Collecting Procedures, and Statistical Treatment used to analyze the gathered data. The researcher also discusses how they choose and how many respondents are needed in data gathering. After gathering the data, it explains how the instruments are formulated, necessary, and interpreted in the study. This section also describes the method used to conduct the study.

Research Design

The Research Design that the researcher used in this study is descriptive sampling and developmental research design. The methods in the study are quantitative and qualitative approaches along with the system development process.

Locale of the Study

The researcher collects the data from the population of Students, Faculty Members and Department Heads/Admin located at the Polytechnic University of the Philippines - Quezon City Branch. They are chosen to criticize the proposed system.

Population, Sample Size, and Sampling Technique

The population size is 80 estimated Students, 10 estimated Faculty Members, and 10 estimated Department Heads/Admin. Determining the number of population and using it to determine the sample size resulted in a total of 100 respondents.

Simple Random Sampling will be used to select the respondents in conducting the study and the researcher will choose them at random.

RESPONDENTS	SAMPLE	PERCENTAGE
STUDENTS	80	80%
FACULTY MEMBERS	10	10%
DEPARTMENT HEADS/ADMIN	10	10%
TOTAL	110	100%

SAMPLE SIZE

Figure 5: Sample Size and Percentage of Respondents

Research Instrument

The Research Instrument used in this study would be the Web-based Application that the researcher will develop, together with the Survey Questionnaire through Google Forms that is aligned to the Statement of the Problem. The researcher will use the Likert Scale Technique to give equivalent interpretations. The Scale, Range, and Verbal Equivalents for interpreting the weighted mean in terms of level of frequency are shown in the table below. The mean is calculated using the interval between the **highest (5)** and **lowest (1)** scores.

LIKERT SCALE	RANGE	VERBAL INTERPRETATION
5	4.50 – 5.00	Very Highly Satisfied
4	3.50 – 4.49	Highly Satisfied
3	2.50 – 3.49	Moderately Satisfied
2	1.50 – 2.49	Slightly Satisfied
1	1.00 – 1.49	Not Satisfied

Figure 6: Likert Scale Interpretation

Data Gathering Procedure

The Researcher will conduct a survey on the Students, Faculty Members and Department Heads/Admin. The Survey Questionnaire will be distributed the link of Google Forms and explain the important matters before they answer the questionnaire.

After gathering the needed data, the researcher will compute and interpret the results of the survey with the use of tables.

1. **Formulation of Data Questionnaire and Survey Forms**

   The researcher will evaluate the key problem to create a proper survey questionnaire which will help the respondents to answer it with ease.

2. **Validation and Distribution of Data Questionnaire and Survey Forms**

   The questionnaire that the researcher prepared will review and check it to ensure that the questionnaire is related to the study and produces the appropriate outcome. When the survey forms are approved, the researcher will distribute the survey link to the respected respondents.

Ethical Considerations

- Obtaining consent from participants to participate in a study by providing sufficient information, including its aim, methods, potential risks and benefits, and participants' rights.

- Preventing illegal access, use, or disclosure of participants' personal information and data.

- Assuring the study's scientific validity and that data is collected and processed in a thorough and unbiased manner.

- Making certain that participants are treated with dignity and that their autonomy is respected throughout the study.

Statistical Treatment

The following statistical tools will be used in the analysis and interpretation of data.

Sample **Size** is a frequently used term in statistics and market research. It is well known especially when you're surveying a large population of respondents.

$$\text{Sample size} = \frac{\dfrac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\dfrac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

*Figure 7: **Sample Size Formula***

Where:

n = Sample Size

N = Population Size

e = Margin of Error

p = Sample Proportion

z = Critical Value z

Percentage is another way of expressing a portion. It is equal to the proportion times 100. This was used to provide the relative distribution of respondents according to some variables.

$$P = \frac{f}{N} \ X \ 100\%$$

*Figure 8: **Percentage Formula***

Where:

P = Percentage

f = Number of Respondents

N = Total number of Respondents

A **Weighted Mean** is a kind of average. It will be used to describe the perception of the respondents on each indicator by assigning a particular value to a particular response**.**

$$W = \frac{\sum_{i=1}^{n} w_i X_i}{\sum_{i=1}^{n} w_i}$$

*Figure 9: **Weighted Mean Formula***

Where:

M = Weighted Mean

f = Frequency

x = Corresponding Remark

∑(fx) = Summation of the multiplied variables

n = Total Number of Respondents

A **T-Test** will be performed to determine whether there are any significant differences between users of the traditional Complaint Management System and users of the Complaint Management System using the Naive Bayes algorithm.

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\dfrac{S_1^{\,2}}{n_1} \quad \dfrac{S_2^{\,2}}{n_2}}}$$

*Figure 10: **T-test Formula***

Where:

t = T value

x̄1 = Observed Mean of 1st Sample

x̄2 = Observed Mean of 2nd Sample

s1 = Standard Deviation of 1st Sample

**s2**= Standard Deviation of 2nd Sample

n1 = Size of 1st Sample

n2 = Size of 2nd Sample

Software Development and Process

The researcher will develop a web-based system. In developing the system, the common mark-up and programming languages that the researcher will use are HTML, CSS, JavaScript, PHP and for the database is MySQL. Agile Software Development Life Cycle was used by the researcher to determine its effectiveness and improve the quality for the user.

Agile Software Development Life Cycle (**SDLC)** is the development methodology used in the study. **SDLC** is a method to design, develop and test high-

quality software. The primary aim of SDLC is to produce high-quality software that fulfills the customer requirement within time and cost estimates. In the study conducted by Naga Malleswari et al. (2018) it shows that the biggest benefits of Agile SDLC are flexibility, advanced collaboration, continuous improvement, user-friendly and changing processes.
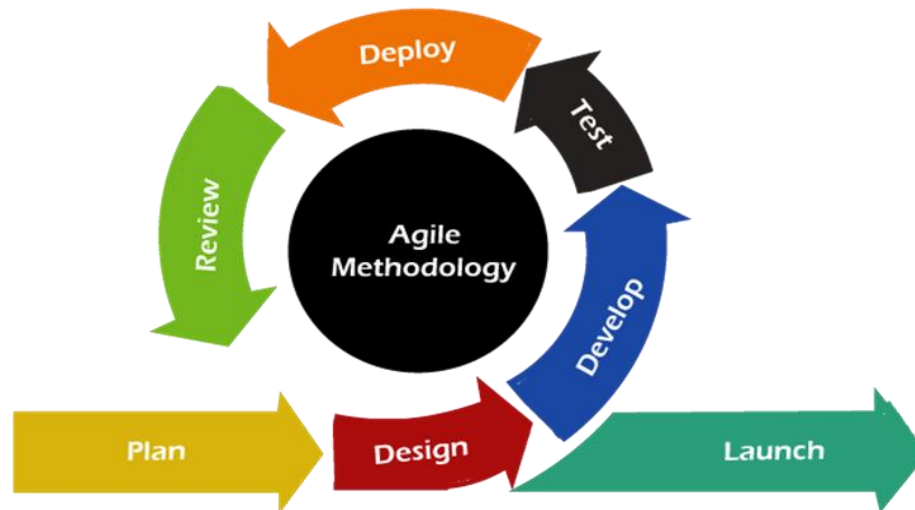
Figure 11: Agile Software Development Life Cycle Model

Planning - In this phase, the researcher must plan the requirements such as the steps in creating the system as well as the platform to be used to develop it.

Design – After the planning phase, the researcher will start to identify the project, understand the system, and how it will be designed so that it will fit for the user's requirements before it is implemented.

Develop – This is the process where the work begins, the researcher will develop the system by using the mark-up and programming languages.

Test – In this phase, the system will undergo the test procedure, investigate for possible bugs, and examine the performance of the system.

Deploy – This phase focused on how the application should be deployed to the respondents.

Review – The researcher will review the system by using the gathered information such as the feedback from different respondents and evaluate the results of the research.

Launch – It is the final step wherein it is fully investigated and there's no possible bugs on the system. It is ready to be used by different individuals.

References

- Keszya Wabang, Oky Dwi Nurhayati, Farikhin (2022). *"Application of The Naïve Bayes Classifier Algorithm to Classify Community Complaints*". Date Retrieved December 13, 2022,

  https://jurnal.iaii.or.id/index.php/RESTI/article/view/4498.

- Al-waeli, W. S. N., & Hassan, N. B. (2022). *"Student Complaint Management System"*. Date Retrieved December 14, 2022, https://publisher.uthm.edu.my/periodicals/index.php/aitcs/article/view/2440.

- Lovely Singh Bhadouria, et. al. (2021). *"Online Complaint Management System"*. Date Retrieved December 14, 2022, https://turcomat.org/index.php/turkbilmat/article/view/8766.

- Bailey, D. (2021). *"20 Statistics to Customer Experience Enlightenment. Unicom Teleservices"*. Date Retrieved January 12, 2023, https://www.unicomcorp.com/blog/customer-experience-statistics-infographic/.

- Stone, M. (2019). *"Literature review on complaint management"*. Date Retrieved January 12, 2023, https://link.springer.com/article/10.1057/dbm.2011.16.

- Ombudsman & Queensl. (2021). *"Complaints Management"*. Date Retrieved January 12, 2023, https://www.ombudsman.qld.gov.au/improve-public-administration/public-administration-resources/complaints-management.

- IONOS Inc. (2019). *"Complaint Management"*. Date Retrieved January 12, 2023, https://www.ionos.com/startupguide/grow-your-business/complaint-

management/.

- Pavlov, O. V., & Katsamakas, E. (2020). *"Will colleges survive the storm of declining enrollments? A computational model".* Date Retrieved January 13, 2023, https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0236872.

- Collaborator, L. D. (2022*). "4 ways to encourage healthy competition among students. LearnDash*". Date Retrieved January 13, 2023, https://www.learndash.com/4-ways-to-encourage-healthy-competition-among-students/

- Valente, S., & Lourenço, A. A. (2020). *"Conflict in the Classroom: How Teachers' Emotional Intelligence Influences Conflict Management".* Date Retrieved January 13, 2023, https://www.frontiersin.org/articles/10.3389/feduc.2020.00005/full.

- Heath, H., & Smith, R. G. (2019). *"Precursor Behavior and Functional Analysis: A Brief Review".* Date Retrieved January 15, 2023, https://pubmed.ncbi.nlm.nih.gov/31049979/.

- Sutherland, Patricia Lea (2018). *"The Impact of Mental Health Issues on Academic Achievement in High School Students".* Date Retrieved January 15, 2023, https://scholarworks.lib.csusb.edu/cgi/viewcontent.cgi?article=1723&context=etd.

- Keely Keller (2021) *"Resolving Conflict in the Classroom".* Date Retrieved January 17, 2023, https://www.learnersedge.com/blog/classroom-conflict.

- Gamage, K., Dehideniya, D., Ekanayake, S.(2021). "*The Role of Personal Values in Learning Approaches and Student Achievements".* Date Retrieved January 17, 2023, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8301052/.

- Killen, M., & Dahl, A. (2021*). "Moral Reasoning Enables Developmental and Societal Change".* Date Retrieved January 15, 2023,

https://journals.sagepub.com/doi/10.1177/1745691620964076.

- Carpenter, C., Bradley, P. D. (2018). *"The Utilization of a Formalized Complaint Management System as a Communication Tool to Foster Student Success"*. Date Retrieved January 18, 2023, https://www.igi-global.com/gateway/chapter/187814.

- Zeenath Reza Khan, Shivadas Sivasubramaniam, Pranit Anand & Ajrina Hysaj (2021). *"E'-Thinking Teaching and Assessment to Uphold Academic Integrity: Lessons Learned from Emergency Distance Learning"*, Date Retrieved January 20, 2023, https://edintegrity.biomedcentral.com/articles/10.1007/s40979-021-00079-5.

Group members:

Gariando, Edmark R.

Las, Dominique L.

Marquez, Mark Christoffer D.

Yamat III, Hipolito V.

Adviser:

Prof. Demelyn E. Monzon

Date: July 4, 2023

REMARKS:

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OTHERS:

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