**CHAPTER I**

**INTRODUCTION AND ITS BACKGROUND**

Technology gives so much impact in our world today. People are now aware of the thing called technology. Most of the people uses devices to make their work faster, easier and convenient. These are being used by companies whether it is small or big, in government offices, schools, churches, homes and even at the streets. Technology help people to make life convenient and comfortable. Our lives has change as our world continue advancing in technology.

An organization without communication is like a building with no walls. There are some disadvantages that exist without communication in an organization. According to the article of Emma (2018) entitled “Importance of Technology in a Workplace” workplace technology enhances training and development efforts. Technology is such an integral part of the 21st century workplace that any business and organizations without some level of technical savvy will likely fail. It is that critical. Technology make your business more efficient, at its most basic level, technology allows you and your employees to be more productive and efficient. It ensures computational accuracy and it is industry relevant, regardless of your industry or profession, there is technology honed to make what you do easier.

Communication Technology has become important in our daily lives. Both individuals and organizations use communication technology to get what they need. However there are still organizations that are still using the manual way which people are used to, because of that, they consumes a lot of time and effort just to get the file that they are needed. There are still organizations that are using the old manual way of transferring and receiving files. They use flash drive to copy files in other departments that consumes their precious time and cause delay of work due to their extensive building. In connection of these, the researchers recognized the use of computerized systems and one of those is the used of LAN based instant messaging system.

A LAN messenger is an instant messaging program designed for use within a local area network. LAN Messenger offer basic functionality for sending private messages, file transfer, chat rooms and graphical smileys. The advantage of using a simple LAN messenger over a normal instant messenger is that no active Internet connection is required and only people inside the firewall will have access to the system.

The researchers recognized this system because we all know that working in government offices is a really busy workplace. Every minute is important because they are giving service with their fellow citizens.LAN messenger will fulfill all the organization’s needs and bring all the organization’s communication to a single point that is why the researchers and the client believe that having this system is a great help in their everyday work in terms of personal communication, uploading, sending and downloading files without leaving their work station and without wasting their time and energy.

**Project Context**

LAN Messenger is chat system for intranet. LAN Messengers has been widely used by companies, business and organizations for office communications. Communication becomes easy and efficient by installing an instant messenger system inside an organization, In fact many organizations are using a LAN based messaging system to make their work faster.

Luisiana, officially the Municipality of Luisiana, is a 4th class municipality in the province of Laguna, Philippines. The Luisiana Municipal Hall was built in 1959. It has three floor building consist of 14 departments and it has a total of 158 employees. Each department has computers that the employee use. There are total of 45 PC’s in all departments. As of now employees are still using the old process of sending and receiving files although they use computer to store files, the employees use flash drive just to get the files that they are needed. They are facing this problem due to the weak connection of their internet provider. And because of using this method employees are having a hard time climbing stairs that causes delay of work because of the municipality’s wide building. Instead of working continuously they are inconvenienced which cause decreasing of their productivity.

Based on the information that the researchers have gathered, Luisiana Municipal Hall, (a) uses manual method of sending and receiving file by using flash drive. (b) Weak connection of internet provider causes delay of work and waste of energy due to climbing stairs whenever they need files from the other department. (c) Using an old method of sending and getting files can take time, energy which decreasing the productiveness of the employees and effort before they get the files or documents that they are needed. Based on the interview, the specific problems that the researcher has collected; (1) how will the employees work and send files without the need of internet connection? (2) how will the employees communicate with their coworker instantly? (3) how will they get a centralized network connection in the municipality’s building?

Problems have been identified through series of interview gathered by the developers. The municipal hall of Luisiana wants to fix their problem by having a system that can send files without the need of internet connection. In response to this goal the developers intended to create a LAN Messenger entitled ”LIM: Luisiana Instant Messaging” they want it to be LAN based so that they can still send files to other departments even if there is no internet connection. This is a reliable system that will provides benefits to the employees of the municipal hall. With LAN Messenger all PC’s are connected to each other, employees can send files through computers. The system was a big help in terms of sending files and office communication. This system is very useful to the employees of Luisiana Municipal Hall and the municipal hall as well.

**Purpose and Description**

Based on the information that has been collected, the researchers found out that the municipal hall of Luisiana needed a reliable system that will help them send files without the use of the internet and without wasting their time and energy. The researchers came up with the idea of creating a LAN Messenger, the purpose of the study is intended to design and develop a messaging system that will solve the problems encountered by the employees of the municipal hall. This system benefited the municipal hall and the employees as well. The main purpose of the software is that it can help the employees to make their work faster in terms of effective communication and sending files that leads into increasing of employee’s productivity.

The researchers believe that developing the system for the Municipality of Luisiana would be a great help to their everyday work. Thus, prompted the researchers to develop the LIM: Luisiana Instant Messaging utilize to send files within the municipal hall. Share files from PC to PC and PC has become easy. With a LAN messenger, transfer files are easy, and enjoy a high-speed for file transition.

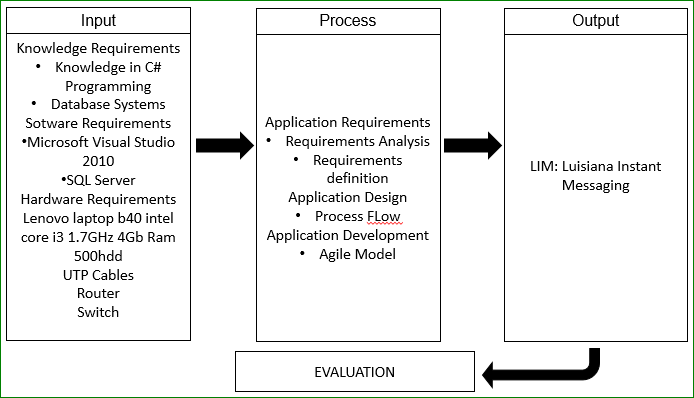
**Research Framework**

The developers developed a conceptual framework for the study” LIM: Luisiana Instant Messaging” to discuss further flow of the system.

**Conceptual Framework**

The study used the input, process, output (IPO) model in order to determine the effectiveness on the implementation of “LIM: Luisiana Instant Messaging”. Input is identifying the most applicable method to meet the identified needs, the process is accessing the implementation of the system and last is the output of works.

To fully determine the purpose of the project the researchers present the following:

**Figure1. Phase 1 of LIM Research Framework**. Shows the requirements that needs to develop a research study, the process that will use of the researchers, and the possible output of the developed system.

**Research Objectives**

The study aimed to d evelop a web based messaging system with LAN connection entitled: ”LIM: Luisiana Instant Messaging” that can help the employees of the municipal building of Luisiana, Laguna in sending files in each department in easier and faster way.

Specifically the study aimed:

1. To create LAN based messaging system that can access easily by the employees of Luisiana municipal hall with effective communication in sending their files, help them be efficient and increase their productivity.

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2. To make a network architecture to find the centralized network connection for the Luisiana Municipal Hall.

3. To evaluate the system based on Technology Acceptance Model.

**Significance of the study**

One of the main problem of Luisiana, Laguna Municipal Hall is the manual process of sending and receiving of files. Some of the effects of that manual process is that it is very time consuming which causes decreasing of employee’s productivity. The Luisiana municipal hall has been using the manual process of sending their documents. The project is entitled, “LIM: Luisiana Instant Messaging”, the purpose of this study is to help and make work of the beneficiaries easier and faster.

The system intended to produce a reliable LAN Messenger for the municipal hall of Luisiana. The following are the beneficiaries of the system.

* **Municipal Hall of Luisiana.** It will be benefitted in the study because the system is free and especially develop only for the municipal hall of Luisiana.
* **Employees.** This study will help the employees to easily send the files on other departments. There is no need for them to stand and get out from their office just to get the file that are needed in other department. The employees will be the main benefactor of this system for which they are the one who will use the system.
* **Researchers.** The study helps the researchers to gather important useful information that exploit their knowledge. By doing this study, the researchers improve their skills and learn new techniques in terms of developing the system, documenting the software and improve cooperation with each other.
* **Future Researchers.** This study can be used by the future researchers as guide of reference for their research study with the same concept. Those future developers who will use this system will be motivated and inspired to develop software that will be useful and will help in many ways.

**Scope and Limitation**

The study entitled ”LIM: Luisiana Instant Messaging” is a messaging system that is design to send files and documents which is needed by other departments for the employees and the municipal hall of Luisiana.

The coverage of the study includes the following:

* The study focused on the development of a LAN based system that is capable of sending, uploading, and downloading of files.
* The study accepts different documents formats such as Microsoft word, excel, power point, text file, acrobat-portable document format, and multimedia format with file extension of .jpg, .jpeg, .png, .gif.
* The study also includes the network architecture to get the centralized network connection for the municipal hall of luisiana.

However, the study also has its own limitations:

• The study does not work if the server has been turn off.

• The study does not work if the connection has been interrupted.

• The study is limited if there is signature involved.

• Sending of files is only limited to 50 mb.

• The content of the study will be limited; it will only be based upon the given information of the municipal I.T of the municipal hall.

• The researchers are not responsible for the cables that could break.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE AND STUDIES**

This chapter of the study entitled: LIM: Luisiana Instant Messaging contains the review of related studies and literature used by the researchers as reference. The researchers read published and unpublished materials such as books, journals, thesis etc.

**Foreign Related Literature**

The researchers browsed through the internet for the foreign literature. The following information was from foreign sources and the scope of each detailed literature is relevant to the study.

Based on the article of Ramesh P. (2016) entitled “Output Messenger: Simple LAN Messenger for secure office chat” The instant messaging software uses for Communication over Local Area Network is called as LAN Messenger. Any organization without effective communication may encounter various problem. Either small or medium business or organization, it is difficult to communicate with all employees at once. Using LAN Messenger can improve the office communication, it provides secured and reliable instant messages over the Local Area Network without Internet Connection. LAN Chat software will fulfill all the organization’s needs and bring all organization’s communication to a single point.

According to Higgins and Smith (2017) in the article entitled “How an effective office chat messenger increases staff productivity” Communication is the backbone of civilization. Communication has a huge impact in an organization. There are numerous research studies conducted that proves that a clear and frequent interactions between employees, their peers, and the management is very essential that’s why the email was launched. Although there have been speculations that office chat messengers disrupt the workflow, a recent study by Ohio State University proves it. The study shows that workers who use instant messaging in their job experience less interruption than the ones who don’t. It also shown that office messenger is far less disruptive than the other forms of communication such as telephone, email, and face to face conversations. It doesn’t take much effort to deduce that lesser interruptions mean increases productivity.

As mentioned by Pierce Ivory (2016) in an article "The Importance of Communication Within an Office Environment" open communication can go a long way towards improving employee morale and increasing productivity. Using software for office communication can improve office relations and boost efficiency. There are few primary reasons that communication is so important in a workplace: It improves productivity and efficiency, it can increase job satisfaction, it can reduce absenteeism and employee turnover. There are multiple solutions for improving communication in the workplace and one of those solution is through an implementation of a software in an organization for office communication.

As stated by George Root III (2018) in the article "The Importance of Communication Between Different Departments in an Organization' Communication is one of the organizational functions that helps a company to stay efficient and productive. One of the more important forms of organizational communication is inter-departmental communication. Flow of information within departments is important. Improving communication between departments improves the efficiency of the overall operation of the organization. Communication also avoid conflicts within an organization. A breakdown in communication at any point in the organization can result in conflict. When departments engage in conflict, the productivity of the entire organization is affected.

Stated by Ramesh P (2015) in the article “Benefits of Instant Messaging” Instant Messenger is a software that delivers messages to buddies and co-workers in real-time. Instant Messenger has a great number of advantages. Employees can feel free to communicate and gathers all under one virtual room. Instant Messenger can protect information because it offers security only people inside the firewall can get access to the system. Instant Messaging system is also a good service provider, it helps organizations to provide a good customer services. Instant Messaging system has all needed commutation parts like Chat rooms, Group chat, Announcements. Thus, phones call is not needed which will reduce telephones call costs. Instant Messenger unites employees in a virtual room and saves travel expenses and valuable time. Relationship Builder, Instant Messenger will bind each employee in one cord and maintain the collaboration equity among them which would build strong relationship among teams as well as individuals. Limited Interoperability, Instant Messenger prohibits chats from outside the concern network and allows the Remote employees to mingle with you through the permission will be set by system administrator.

**Local Related Literature**

The researchers searched through materials that is related to their topic.

As stated in the article of Giampaolo et.al (2015) entitled, “File System Management”, methods, systems and apparatus, including computer program encoded on a computer storage medium, for file management system. In one aspect, a method includes receiving a request at a cornel to perform a file operation on a particular file; file identifying a plug beat associated with the file; involving users space file handler to perform particular action when the flag beat is set; determining whether notification. Action has been performed by file handler is received; and allowing the file operation on the file when notification received.

In agreement in the article of Work Philippines (2017) entitled "The Workplace Revolution – a picture of flexible working 2017" One of the main enablers of flexible working is of course technology. A number of apps allow workers to remain connected and productive at all times from laptops, tablet computers and smartphones. Similarly, business people are making more and more use of solutions that let them access files and desktops remotely through Cloud systems. Technology already provides these workers with all they need to stay connected with their teams and access their files and documents wherever they are. Specifically, VoIP calls and instant messaging apps are increasingly used by workers on-the-go to keep in touch with colleagues and staff cost-effectively: all that is required is a fast internet connection to make them feel as though they are in the office. Without a suitably fast connection it is impossible for businesses to provide workers with access to servers in the Cloud or to desktops. VoIP and uploading of documents on file sharing devices are also cumbersome and time-wasting if the IT infrastructure isn’t up to speed. It is clear that the world of work and the workplaces of today are quite different to twenty years ago. It is not just technology that is facilitating this metamorphosis but it is people’s attitudes and mind-sets that have created the demand to work flexibly and promote agility. More than 20,000 business respondents from more than 100 countries were interviewed via an online survey during September 2016. These were sourced from Regus’ global contacts database of more than 2 million business-people worldwide, which is highly representative of senior managers and owners in business across the globe. Respondents were asked about their views on the effects of flexible working on workers, management and businesses. They were also asked about workforce composition and how the world of work has changed and is expected to change. Respondents also provided information about the mobile work technologies they used in the previous month and key enablers for remote work. The survey was managed and administered by an independent organization.

In compliance with TJ Pestano (2018) in the article entitled "How Technology is changing the Filipino Workplace" The trends in the digital workspace will definitely have an impact on Filipino employees and employers. Both of them need to be technologically ready and responsive to this new workplace culture to stay relevant in their industry. Unfortunately, studies show that organizations are not doing enough to help their employees cope with digital trends in the workplace. Approximately 47% of respondents in the study expressed the lack of company initiative in equipping them with technological know-how. Technology is meant to drive employees’ productivity, as well as enhance work processes that will help companies improve their products and services. That said, be sure that you have the right hardware or software solutions for your teams’ use. Otherwise, when employees feel that you’re incorporating technology without purpose other than to merely to keep up with trends, they might only regard it as a barrier that prevents them from working efficiently and choose to stay away from using technology to do their work altogether. Technology is now a necessity and no longer an option. But to reap its benefits in your organization, you first must develop a culture of readiness among your employees so that technology will become a useful instrument in achieving success in the workplace.

**Local Related Studies**

The following studies were searched by the researchers with the help of the internet which gave the researchers some details and information that were related to the study. Also, reading some thesis and projects gave them knowledge and information regarding the study.

According to Aclo, Afalla and Mercado (2017) in the study entitled “ASADO: Automated Student File and Document Organizer” The university LSPU-CCS in Sta.Cruz campus is having problems in compiling all the student’s school papers and are sometimes thrown in the garbage bin. So the researcher’s create a system that will solve the problem of the said college department. ASADO is an automated system that solves the problems in handling the compilation and storages of student portfolio. To create the system they used visual studio 2010 as programming language and SQLyog as database. The researchers used Agile software Methodology for an initial evaluation of the system; they also used Technology Acceptance Model to determine if the technology developed was compatible to its software. After implementing and evaluating the software they come up with a result that ASADO is a great help to the CCS department; it provides an organized storage and easy retrieval of files. Instructors can send files by using LAN connection. The system helps the students and the instructors in terms of sending and storing of files.

Based on Dionio (2015) in the study entitled ”A Prototype Intranet-Based Instant Messenger at Capiz State University, Mambusao Campus, Mambusao, Capiz, Philippines” The study was conducted to design and develop a prototype intranet-based instant messenger at Capiz State University, Poblacion Mambusao Campus, Mambusao, Capiz, Philippines and to determine its acceptability in terms of necessity, practicability and reliability. The software is designed as client-server system for the use of the students and employees to send, receive and check messages and to do chat. The users are allowed only to use the system that performs chatting, sending and checking of messages. The server system is designed for chatting, sending and checking of messages, to access students, personnel, departments and programs’ data entry, and to check the report. The system administrator is allowed to access all transactions in the server, the school administrator and the dean can perform only sending/receiving of messages, chatting and viewing of the reports, the faculty and staff can send/receive messages and chat only, the clerk who is the in charge in encoding is allowed only to access send/receive messages. To test its security, the software authenticates first the user if he or she was registered in the database before the user can access. The user cannot easily have access to the software without registering first to the data encoder of the department. The developed software can secure intranet-based instant messenger by authenticating the user’s membership from the database. The researcher tested the acceptability of the software by allowing the target clients to use the program. A survey of the necessity, reliability and practicability of the software was filled among the client. Based from the results, the researcher concluded that the prototype software for secure intranet-based instant messenger can be designed and developed. The developed prototype intranet-based instant messenger for CapSU Mambusao Campus was moderately acceptable in terms of necessity and practicability while acceptable in terms of reliability.

As stated by Bismanos et.al (2013) in the study entitled “Local Area Network Wired and Wireless Simulator” This is a type of networking that let the user choose a computer laboratory that sends data to the target PC. The system has different types of topologies which are bus, ring and star. It also has a wireless network. With the new friendly stimulation, it is possible to connect to the PC hub. With the help of the system, user can network to the computer in a short period of time. A computer network is nothing but a connection of two or more computers by a wire or by a wireless connection to exchange information. The two types of network that can be developed in home are wireless network and traditional wired network. With regards the problems of students in the ground of networking and connecting to the computer, the study can help the students of Our Lady of Fatima University Lagro in networking. The study focused on the simulation of computer network operation using system software. The main purpose of the study is to develop a system which will provide its beneficiaries with information about the different network topologies and how data is transferred within them. The proposed system solved the networking problem and will send data by clicking the send button. In order to estimate the existing and the proposed system, as well as to know which is better, the proponents conducted a survey. The respondents, who are the students of Our Lady of Fatima University, participated in the answering the survey and testing the system and resolve which is better that the existing system and proposed system. However, the user friendliness, effectiveness, accessibility, and the speed rated as strongly agree in proposed system.

Based on the study of Manipon, Montanez and Esguerra (2016) entitled, “E-DOMS: An Electronic Document Management System for the college of computer studies” College of computer studies is one of the department in Laguna State Polytechnic University Sta.Cruz Campus. The CCS dean’s office staffs is using the traditional way of recording they are using pens and papers in managing office documents like communication letters, student letters etc. There are times that some important documents are misplaced, which resulted hassle to the office staff because it consumes so much time and effort. The system was made to provide CCS associate dean’s office an automated and secured document management system. This can help the office in managing their document files and other important data. The system was developed for the benefit of the users. The one who serve as the administrator of the system is the owner who will maintain and manage the system.

Stated by Calma, Lazarondo and Sol (2016) entitled “OMS: Office Management Solution for CCS” Document management is how an organization stores, manages files and tracks it electronic documents. It is a software that controls and organizes documents of an organization. Document management systems are usually used on large business and offices. The project that was developed by the researchers entitled OMS: Office Management Solution for college of computer studies provides the college a more convenient way of tracking or searching documents would be having unique codes. It also help on organizing tons of documents and files. The department demanded that the system would also offer security to all the documents they created and received it also has the ability to print documents.

**Foreign Related Studies**

The following information was from foreign sources and the scope of each detailed study is relevant to the study.

As mentioned by Christopher, Etu and Jack (2016) in the study entitled “A Model of Local Area Network Based System for Inter-office Communication” In most organizations, information circulation within offices poses a problem because clerical offices and office messengers usually dispatch letters and memos from one office to another manually. Sequel to this circulation procedure, implementation of decisions is always difficult and slow. On the other hand clerical officers sometimes divulge confidential information during the process of receiving and sending of mails and other documents. The researchers develop a messenger software, and ensuring that the systems are linked for effective communication. The objective of the study is to design a messenger software that installed in an organization LAN for the purpose of information circulation, To build a model to ensure the security of messages transmitted on the system, To develop a model of a system that would keep track of information flow within the organization, and To incorporate a model for an electric bulletin board for the organization. They use prototyping model with JDK 1.6 version of java. The system was installed in a campus LAN with a cable network, and it worked efficiently except, of course, on some systems with bad LAN cable. The main objectives of the system was achieved.

Based on Abba et.al (2013) in the study “Development of LAN Chat Messenger (LCM) Using Rational Unified Process (RUP) Methodology with Object Oriented Programming” is a chat system via local area network. The functions of the system include voice call, send files, call history, save conversation, chat room, conference calls and so on. The procedures are generally designed to succeed at least two aims. First, they attempt to limit the harm to the network that valid clients may cause, for example, by mistakably downloading virus infected emails or by permeable secret business information to the outdoor world. Second, network edge security strategies can limit or sometimes eradicate difficulties produces by worms and other types of malware. Object oriented programming was used in the development of the system. They used Rational Unified Process methodology for the system. The LCM is established as a solution to some communication problems and reduces the use of resources including time factor of an organization’s internal communication. The proposed system enables users to communicate on networks outside internet boundaries. The proposed system can be a future replacement for many internet chat systems and will cost the organization lesser resources to implement. The strengths of the system identified by this study are: more communication opportunities within an organization without using an internet subscription; it can work on all Windows platforms provided that the client and server are using the same type of operating system; it provides users to make voice call and send files; it enables connected clients to save their chat conversations; it supports peer to peer and server-based modes; user interface is common and familiar; and users may create chat rooms for specific topics or users so if there is any urgent management announcement is easy to broadcast to everyone at once and to specific persons only.

As stated by Singh and Singh (2018) in the study" JABBER – Encrypted Client Chat Server Network" when you are chatting, everything you type will instantly be transmitted around the world to other users that might be watching their terminals at the time. Chatting is based on client-server model. Clients are programs that connect to a server; a server is a program that transports data, from a user client to another. There are clients running on many different systems that allow you to connect to a chat server. Presently the vast majority of the present talk systems are text-based informing and requires login to work on internet however none of them are appropriately secured that's why data packets transferred can be altered by different ways. This is a major threat in terms of security. In military services, the secure communication is the major concern. If the data packets are intercepted and altered by opposite group, they can lead to major damage. The privacy of a person is at major stake as cryptography can generate keys, but generating keys in a random order are a difficult.

As mentioned by Beharry and Pfano (2018) in the study “The effect of modern office technology on management performance: Durban Westville” In businesses, an effective way to improve productivity is to raise the level of technology. Modern office technological gadgets such as smartphones, faster Windows operating systems, laptops and tablets are being used by many managers and are helpful in terms of making their work very flexible and easy. This study is aimed to show that the availability of office technologies in businesses, and their use by managers increase management productivity. Businesses should procure as many appropriate modern office technologies as necessary in order to ease management tasks and to enable increased management productivity. The study explores the extent of the availability of office technology, its cost, benefits and the risks of use. Technology is important for management productivity, ICT has proven to be a very important factor to make communication smooth and effective. This is a quantitative study, and an appropriate quantitative data analysis approach is undertaken. Data were collected using a questionnaire, which was distributed to 67 participants who were randomly selected. The participants are business managers, mostly, top managers. The questionnaire had 31 structured close-ended questions. Using this method allows results to be easily interpreted and analyzed using statistical tests like Analysis of Variance (ANOVA), Pearson’s correlation, central tendency, T-test, and other tests. The study find that office technologies improve managers’ performance if they are effectively managed through improved communication between managers and other employees. Office technologies make work task easy, reduce costs and, at the same time, reduce the level of errors. With over 90% of respondents agreeing that modern office technology is important for business, the results show that the relationship between using technologies and managers’ performance is positive because many respondents use technology and also believe that it improves performance.

Based on the study of Davis (2015) in the study entitled “Document Record Management System (DRMS)” to predict the phenomenon of a new technology adopted with a group. TAM emphasized the acceptance and used of technology as explained by user’s internal beliefs, attitudes and intensions. Since DRMS was proposed various related researched explore the topic of technology acceptance and design. This research provides the foundations of understanding and identifying a user’s technology acceptance and use of technology for various disciplines in the field of online learning. DRMS has been applied to and considered in a number of e-learning acceptance research.

**Synthesis**

Based on the studies and the literature gathered by the researchers the system entitled “LIM: Luisiana Instant Messaging” have similarities and differences from other studies and research. The proponents analyzes articles, thesis, websites and system that they see to easily understand and make possible output of the system.

Based on the article of Ramesh P. (2016) entitled “Output Messenger: Simple LAN Messenger for secure office chat” The reason why LAN Messenger is you can communicate with all employees at once. You either run to discuss with your employees, or spend your precious time to have common meeting. You can use E-mails but it is a slow process, we know. To overcome this situation and improve the communication, you can prefer the LAN Messenger which will deliver the instant messages to your employees in no time and save your valuable time. Now, According to the study of Higgins and Smith (2017) in the article entitled “How an effective office chat messenger increases staff productivity” workers who use instant messaging in their job experience less interruption than the ones who don’t. It also shown that office messenger is far less disruptive than the other forms of communication such as telephone, email, and face to face conversations. It doesn’t take much effort to deduce that lesser interruptions mean increases productivity.

As stated by Bismanos et.al (2013) in the article Philippine E-Journals entitled “Local Area Network Wired and Wireless Simulator” A computer network is nothing but a connection of two or more computers by a wire or by a wireless connection to exchange information. In additional, Based on Dionio (2015) in the study entitled ”A Prototype Intranet-Based Instant Messenger at Capiz State University, Mambusao Campus, Mambusao, Capiz, Philippines” The server system is designed for chatting, sending and checking of messages, to access students, personnel, departments and programs’ data entry, and to check the report.

As mentioned by Christopher, Etu and Jack (2016) in the study entitled “A Model of Local Area Network Based System for Inter-office Communication” In most organizations, information circulation within offices poses a problem because clerical offices and office messengers usually dispatch letters and memos from one office to another manually. Sequel to this circulation procedure, implementation of decisions is always difficult and slow. On the other hand clerical officers sometimes divulge confidential information during the process of receiving and sending of mails and other documents.

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**CHAPTER III**

# Research Methodology

Research methodology presents the research method used by the researchers to formulate and design study. Different techniques are listed to prove the effectiveness of the study. The following procedures are included in the study and project implementation:

# Research Design

The researchers discussed the different methodologies and processes that has been used to gather the necessary information for the study. This study made us use of various factors and methods for the completion of the research. This development requires preforming the following procedures that are essential in the study and on the project implementation. This presents the methods and procedures that are used in completing the study.

The descriptive method of research was used in this study. Descriptive method of research was use used to gather information relating to present existing condition of the phenomenon. Descriptive research was used because the researchers wanted to gain a better understanding of research. In addition, the descriptive approach was quick practical in terms of the financial aspect. This method allows a flexible approach, this when important new issues and questions arise during the duration of the study further investigation may be conducted. The researchers used this method to obtain information about the phenomenon being studied in order to accurately describe the way of disseminating information in Luisiana Municipal Hall.

# Population of the Study

This section described in brief the place where the study was conducted and the rationale behind its choice. It shows the exact location in relation to the community.

In this study, the research locale is the municipal hall of Luisiana, Laguna. The respondents of the study is composed of 14 head municipal staffs or representatives in each departments. There are total of 14 departments. The researchers used a technique such as interview, survey, research and sampling.

# Data Collection Method

The researchers would explore a deeper analysis about the problems that they have encounter during the research, designing, and data gathering process. In order to gather the information needed for the study, the following methods were applied:

**Library Research** - The researchers used libraries within the university and other universities. They gathered information used to conduct this study.

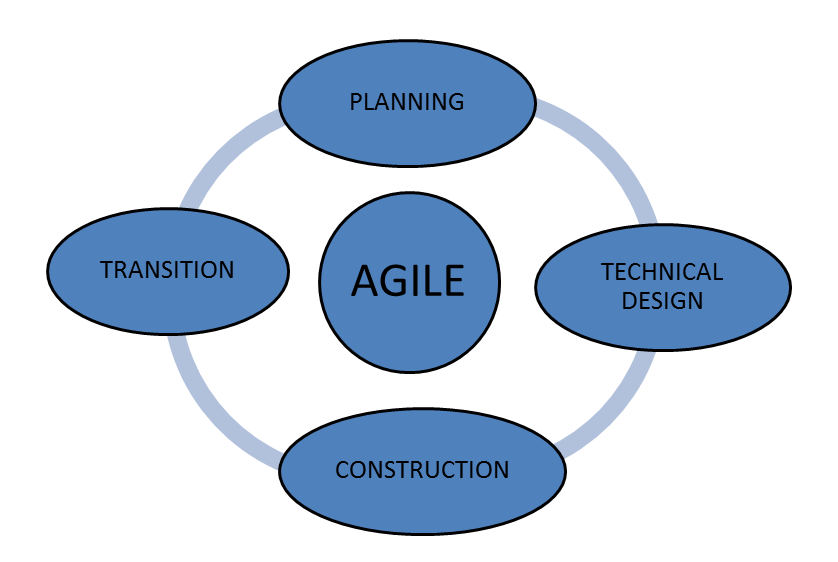
**Internet Research** - The researchers used the computer to browse the internet. They gathered information to be used in the system. Some items needed for the system has also been found in the internet. The internet has been a great help for the searching process needed for the building of hardware and the creating of codes.

**Interview** - It is also conducted to gathered information needed for the system flow. In this method, the researchers distinguished how the system would work. It was used to investigate and gather specific information needed.

The **consultants** gave generous amount of their time and knowledge in guidance to the students. The consultants would give ideas to the researchers in developing the system. The consultant suggest the design of the system and he would help the researchers in coding the system. With the help of the consultant, the researchers analyzed and built the system easily.

# Software Methodology

The researchers use the Agile Model that aims to produce a high-quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates. Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solution evolve through collaboration between self-organizing cross-functional teams.



**Figure2. Agile Software Methodology** shows the flow that used to determine the processes of the research study from collecting of data to the client, formulate the system design, developing of module that fit to the needs and to testing the developed system.

**Agile Software Methodology**

The developers acquired data through some types of data collecting method which is interviewing, consulting and observing the existing process of the system to identify what the problem that they bump into for them to articulate the solutions and ease the process and lessen the work load.

**Phase I Planning**:The developers collected data by interviewing, consulting, observing the current process of the system if what is the problem that it is encountering for them to formulate the solutions. They also plan with the IT of the municipality of Luisiana, Laguna.

**Phase II Technical Design**: After gathering the data from the current process, the initial design of the system was released with the working modules but not so furnish but it has what the client or user needs, the user has an idea about running the system.

**Phase III Construction**: Obtaining iterations from the prototype helped the developers to develop a revised system that will be more productive; this is where the modules are being furnished. After the users sees the improvement on the system and suggesting of giving idea to the developers. System design phase is going to be a required step.

**Phase** **IV** **Transition**: After the revising the iterations and developing of the system, a test is the next step for the research which is check if the system is fully functioning and ready to be implemented and given the client or user.

# Project Design

The researchers followed the phases base from the Agile. These were follows evaluation phase, Evaluation of the processes and current structure of the company, Suggestions for improvement and process optimization, System design together with the client, System construction and implementation and lastly the Evaluation and monitoring phase. The development of LIM: Luisiana Instant Messenger was based on this phases.

# Requirements Documentation

**Visual Studio Code -** Visual Studio Code is a source code editor developed by Microsoft for Windows, Linux and mac OS. It includes support for debugging, embedded Git control, syntax highlighting, intelligent code completion, snippets, and code refactoring. It is also customizable, so users can change the editor's theme, keyboard shortcuts, and preferences. It is free and open-source although the official download is under a proprietary license.

**PHP -** Hypertext Preprocessor is a server-side scripting language designed for Web development.

**CSS -** Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language like HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

**Bootstrap -** Bootstrap is a free and open-source front-end framework for developing websites and web applications. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions.

**jQuery -** is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. It is free, open-source software using the permissive MIT License. Web analysis indicates that it is the most widely deployed JavaScript library by a large margin.

**XAMMP-** XAMPP is a free and open source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages.

**My SQL**- is an open source relational database management system. SQL is the most popular language for adding, accessing and managing content in a database.

**Router-** A router is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. A data packet is typically forwarded from one router to another router through the networks that constitute an internetwork until it reaches its destination node.

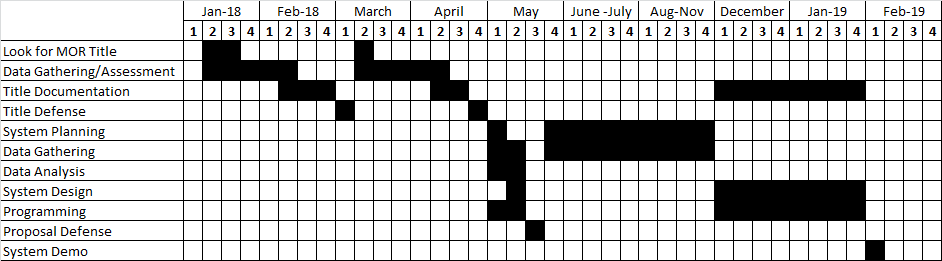
**UTP Cable-** Unshielded twisted pair (UTP) is a ubiquitous type of copper cabling used in telephone wiring and local area networks (LANs).

**Switch**- a switch is an electrical component that can "make" or "break" an electrical circuit, interrupting the current or diverting it from one conductor to another.

**RJ45 -** is a type of connector commonly used for Ethernet networking. It looks similar to a telephone jack, but is slightly wider.

# Software Project Schedule

The researchers used the Gantt chart to show the process how they did their research.

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**Figure 3: Gantt chart.** The figure shows the Gantt chart it is a project-planning tool that shows the beginning and finish dates of individual tasks through horizontal bar graphs. The researcher used this to ensure that the schedule is workable. The advantage of having a Gantt chart is you can use them to keep your team informed of progress of the system and use it to communicate that key tasks have been completed.