**Chapter I**

**INTRODUCTION**

           In our modern world, technology has become the most popular. It helps us to finish our tasks efficiently, makes our life faster, better, and more enjoyable as a result of all of these revolutions, and also assists us in making our world better. Technology is becoming quicker, more portable, and more potent than ever.

             The Document Management System for KTTO or Knowledge Transfer and Technology Office has two branches: the ITSO or Innovation and the Technology Support Office and IPTBIC or Intellectual Property Technology and Business Incubation Center. DMS manages the entire document lifecycle process and provides tools for securely managing a wide range of documents.

               The Document Management System tracks, manage, and stores documents that reduce paper use. Only the patent drafter has access to the various versions created and modified by different users.

**Project Context**

            The Document Management System effectively completes duties and alleviates KTT Office problems. The method is based on the KKT office's situation. This Project attempts to develop a usable system available to everybody while maintaining each file's privacy.

Every file that the ITSO office possesses is challenging to manage. Excel, Matrix, and Google Docs are being used to manage the data they receive from the maker or innovator, and it's not wise for the files not to be well-organized, which is a little concerning. Privacy is not guaranteed or protected. The system allows the maker to view the updated studies but is limited only. The system is also accessible by those authorized to access it.

         Everyone can see this information, but only those authorized to examine it. To ensure that the privacy of all data to safeguarded, no information should be editable by anybody who isn't permitted to do so. It will also work on any device, including a computer, laptop, or smartphone. This system requires a robust internet connection for data transfer to have good performance and quality. It takes little effort to learn and use for people.

**Purpose and Research and Description**

           This Project aims to provide a Documents Management System for KTT Office so that they can find files or documents in a less hassle and faster way. The proponents aim to develop this system to lessen the burden of every staff while finding every file they have**.**Document management refers to the takedown, monitoring, and handling electronic information such as Pdf files, word processing files, and digital images of paper-based content. Document management can help you save both money and effort.

**The objective of the Project**

The main objective of this study is to develop a Document Management System that will track and manage the files in the Knowledge Transfer and Technology Office specifically:

1. To create a technology system that can provide effective and accurate transaction monitoring of documents in KTTO.
2. To create a secure and well-organized database.

**Scope and Limitations of the Project**

 The system will be implemented in the KTTO of the SLSU-Main Campus. The system will only track the KTTO documents. Only the KTTO-authorized personnel and the faculty members involved have the authority to monitor their documents.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE**

**Related Literature/Theoretical Background**

           A document, according to Abbasova (2020), is a container of information that contains written or drawn information for a specific purpose.

The article Document Management System by[Mahendra](http://ieeexplore.ieee.org/search/searchresult.jsp?searchWithin=%22Authors%22:.QT.Mahendra%20K.%20Ugale.QT.&newsearch=true) et. al., (2017). Paperless Document Management Systems are used to reduce business losses caused by physical paper files and filing systems. Furthermore, the increased volume of document production and distribution via e-mail systems has exacerbated issues with document security, control, tracking, and retrieval.

            Implementing an electronic document management system (EDMS) would be a solution to those problems. According to Yatin et al. (2015), an electronic document management system typically refers to a computerized system that facilitates the creation, capture, organization, storage, retrieval, manipulation, and controlled circulation of documents in electronic format. This system will make it easier for the organization to locate and retrieve its files. As a result, EDMS is an essential component in creating a virtual work environment and transforming the capabilities of a modern organization and its workforce (Jones, 2012).

Elsa (2017) 's goal in developing an electronic document management system is to provide an electronic document management system that improves document clustering, categorizing, searching, and retrieval. Because the current study developed the DMS using PHP as the scripting language, the platform used in the study differs. The system included document searching and retrieval capabilities. An electronic document management system aids in the electronic management of documents and ensures the security of information. The Study by AKAY et al. (2019) is a "Document Management System (DMS)" that is used for web-based and systematic document management and follow-up, and it is intended to be used as a document management system in public institutions and universities. Web-based applications facilitate content access while lowering storage and printing costs. A recent study by Adam Uzialko (2021) that document management software is an increasingly critical part of any business in the digital era. Instead of rows of filing cabinets, document management systems create an electronic archive that any permissioned user can access and edit. A document management system can improve efficiency for you and your staff by organizing all of your files and making them easy for anyone in the organization to find. A document management system (DMS) is a type of document or file system that is used to organize and track files. Web-based applications make access to content easier, reducing storage and printing costs. According to Malyon (2016), the CEO of MaxxVault, the company provides electronic document management systems and cloud document management solutions to small, medium, and large businesses across a wide range of industries. It saves money by automating tasks and increasing productivity. Every business generates document records and other digital content. In the Study of Kao and Tiu (2013), a document management system is designed to provide two main benefits: timely access and support for efficient document sharing and collaboration. The Enhanced Document Management system is a document management system for small to medium organizations for efficient management of electronic documents in their organization (Agarkar et.al., 2012).

**Related Studies**

According to Stallings (2012), a file management system is a collection of system software that aids users and applications in the use of files. The file management system is typically the only mechanism for a user or application to access files. This eliminates the need for the user or programmer to create custom software for each application and gives the system a consistent, well-defined method of controlling its most valuable asset.

The goal of a file management system is to meet the user's data management needs and requirements, which include data storage and the ability to perform the aforementioned operations; to ensure, to the extent possible, that the data in the file is valid; and to optimize performance, both from a system and user perspective in terms of overall throughput and user response time; to provide I/O support for a variety of storage device types; to minimize or eliminate the risk of data loss or destruction; to provide a standardized set of I/O interface routines to user processes; and, in the case of multiple-user systems, to provide I/O support for multiple users.

            Anwar and Ahmed (2013) proposed an eCourse file management system to transition from the current method of compiling paper-based course files to a more versatile method of compiling and maintaining electronic course files. The new system provides numerous benefits, including ease of access, information retrieval, and the elimination of storage and disposal issues associated with paper-based files. The system also saves paper and printing costs, reduces the human and financial resources required for course file compilation, minimizes negative environmental impact, saves natural resources for future generations, and contributes to a green, sustainable environment. This system can also be used to track the progress of courses over the course of a semester or year. The proposed system could be enhanced to become a Web-based database system, allowing all input screens and forms to be made available online.

**CHAPTER III**

**TECHNICAL BACKGROUND**

**Technicality of the Project**

Proponents have used web-based programs that users can access via any digital platform. The Document Management System for KTT Office is web-based, making it simple for them to manage documents, and all KTTO staff and researchers have access to it. In our Project, the following technical terms are to be used: VS Code – Text Editor, Server-client side and behavior – PHP, HTML, CSS, jQuery, Apache, Database – Xampp, MySQL, Functionality – Web application, PhpMyAdmin. Some of the above-mentioned terminologies are also used in our system's technology.

**Details of the technologies to be used**

This Project will be available in any technology to run the system, such as mobile phones, laptops, and computers.

The following technological tools will be used in the Project's development:

- We used Microsoft Visual Studio Code to encode the source code of the system throughout development so that data and information could be acquired accurately and quickly. VS Code is designed to provide developers only the tools they need to complete a speedy code-build-debug cycle, leaving more sophisticated processes to others.

- PHP is an HTML-based server-side programming language. It may be used for command-line scripting and client-side GUI programs, as well as managing dynamic content, databases, session tracking, and even building whole e-commerce sites.

- HTML is a markup language that is used to produce electronic texts (called pages) that are displayed on the Internet. This is the language used to create web pages. This is the simplest of the computer languages to learn. We use a Web page editing application to build a Web page without it, but the program will still require HTML to do it.

- CSS is a language for specifying how Web pages are presented, including colors, layout, and fonts. CSS allows web developers to produce an unified appearance throughout several pages of a website by adapting the presentation to

- We decided to use this Javascript library in the development of our system because it is lightweight and will not cause our system to load.

**How the Project Work**

Figure 1 shows the Feature-Driven Development that the maker will submit documents to the patent drafter through the system. The patent drafter views the documents and do a patent search to ensure that the study has not yet existed. The patent drafter will upload drafted documents such as abstact, claims, figures, and technical detailed summary, then submit it to the IPOPHIL. When the IPOPHIL well acknowledges the receive draft, an acknowledgement receipt is sent to the patent drafter, and the patent drafter will upload it to the system. The patent drafter has a log submission status to put all the information about the documents and all the responses from IPOPHIL. And when the maker will login in the system they can monitor the progress of their application. The patent drafter will upload the formality exam result to the system and then submit a response to IPOPHIL and vice versa until the documents is finally correct. And if the documents are already approved the patent drafter uploaded a notice of publication, and certificate to the system.

Figure 2. Architectural Layout of Documents Management System for SLSU-KTTO

Figure 2 presents the architectural layout of the proposed system. The maker will submit documents to patent drafter and the patent drafter will monitor or manage the entire files using PCs, laptops, smartphones, and tablets. Then the documents that are handed by the patent dafter will be saved to the database. The patent drafters are the only ones who manage and upload drafted documents such as abstracts, claims, figures, and technical detailed summaries, then submit them to the IPOPHIL. And whatever response they get from the IPOPHIL, they will upload it into a log submission and the maker can views whatever the formality results, view submission status and also view the response.

**CHAPTER IV**

**METHODOLOGY**

A system or process called document management is used to collect, monitor, and store electronic documents like PDFs, word processing files, and digital pictures of paper-based content.

**4.1 Requirements Analysis**

           This study is a developmental method for it is a systematic work drawing on existing knowledge gained from research that is directed at producing a new system. This Document Management System is totally functional and ready to use. These will surely help the Knowledge and Transfer Office to organize their files easily and lessen their burdens unlike paper-based.

**4.1.1 Economic Feasibility**

▪        ***Cost And Benefit Analysis***

Table 1 reflects the lists of the total expenses or costs incurred for the creation of this Project. The table reflects that Internet usage has the highest expense due to the proponents' need to use internet.

**Table 1. Cost and Benefits Analysis**

▪        ***Cost Recovery Scheme***

           Table 2. Reflects the division of expenses that is reflected in Table 1, in order to gradually pay the costs incurred upon the creation of this Project. The costs of expenses also gradually increase every month this is because the Project requires lot of requirements in order for this Project to be achieved.

**System Requirements**

The system is called Document Management System for Knowledge and Transfer Office (KKTO). In order to access the systems, it needs a stable internet connection. It will upload and manage all the documents and data.

**Input**

· The user must sign up or create an account.

· The user must have correct login credentials in order to use the system.

· The user needs to submit his/her study.

· The user can view the status of his/her study.

· The director or the patent drafter can view the submitted studies.

· The director or the patent drafter can upload different documents.

**Process**

· The system must authenticate the login credential provided.

· The system can upload, submit, and can accept documents.

· The system can update the log submission.

**Output**

· The system will display the log submission status of the users' study.

· The system will display the view submission.

· The accepted Study will be store in the accepted studies.

**Performance**

· The system is operational anytime.

· Response time must not exceed 5 seconds.

· The system is capable of supporting many online users simultaneously.

**Security and Control**

· The user can edit, change and delete only his/her information and uploaded study.

· The system has separate levels of security for users and the system administrator.

**Data and Process Model**

Figure 3 presents the context diagram and the basic overview of the whole system or process being analyzed or modeled. The maker will submit a study to the ITSO office through the system, the non-chemical or chemical patent drafter will accept and manage the submitted documents and upload the manage documents to the system, same as to the admin. Whatever uploaded documents in the system can be seen to the corresponding maker and the maker can monitor whatever changes or status of their studies.

The Data Flow Diagram provides a more detailed breakout of pieces of the Context Diagram into sub-processes. Figure 4 are the Data Flow Diagrams - Director, Patent Drafter, and Maker respectively.

**Data Flow Diagram**

**System Flowchart**

           Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields. Its representation illustrates a solution model to a given problem. Shown in Figure are the system flowcharts for each type of user.

**Object Modelling**

**Use Case**

Figure 8 – 9 are the Use Case Models for the proposed system. These are representations of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user involved.

**Risk Assessment/Analysis**

Table 3. Identifies and analyze all of the potential risks and issues that are detrimental to the Document Management System for KTT Office. The steps to prevent or minimize the occurrence of the identified risk are also presented.

**Design of the Software**

This section discusses the design and implementation of the data structure and algorithms used in the software. It presents the data design that produced the detailed data model of database such as the Data Schema in Figure 9 and data dictionary in Table1-8.

**The Interface Design of the System**

**Login**

This is the part where the user is allowed to enter their credentials before they can continually access the system.

**Signup**

This is the part where the user created their account

**For Patent Drafter Users**. The patent drafter user is required to enter the verification code. The code was set default as per the developer created the system.

**Password Recovery**

This is the part where the user enters their respective email where the system sends an OTP Code.

This is the part where the user is redirected after entering the email above.

**Dashboard**

This is the dashboard of the system w/c represents the visual counts on each category.

**Log Submission**

This is the part displaying the list of created log submission records.

**For Patent Drafter only.**This is the part where the user created a new record for log submission.

**For Patent Drafter only.**This is the part where the user selects a specific record and performs any changes on it.

**View Submission**

**For Patent Drafter and Director User only.**This is the part which displays the list of created study of makers.

**For Patent Drafter only.**This is the part where the user was done doing patent check and wanted to update or upload a new file for the maker's study.

**For Patent Drafter only.**This is the part where the user was done doing patent check and ready to submit the Study to IPOPHIL. The user is required to select one or many documents wanted to upload.

**For Patent Drafter only.**This is the part where the user was done doing patent check and is not satisfied with the submitted study.

This is the part where the user hits the button "See Feedback". It shows a side drawer that displays specific comments between the two or three users. (**Director, Makers, Patent drafters.**)

**Accepted Studies**

**For Patent Drafter and Director User only.**This is the part which displays the list of accepted studies.

**For Patent Drafter only.**This is the part where the user wanted to update the current document uploaded for the maker.

**Maker Users**

**Log Submission**

**For Makers User and Director User only.**This is the part which displays the list of current log submissions. The maker and director is not authorized to make any actions on this part.

**View Documents**

This is the part where the maker sees the list of accepted and rejected studies. Also they can also see or download the uploaded documents from the **Patent Drafters**. Lastly, they also reply to the comment.

**View Studies**

This is the part where the maker sees the list of studies.

This is the part where the maker created a new study.

This is the part where the maker selected a specific study and wanted to perform any changes of it.

This is the part where the maker selected a specific study and wanted to remove it.

**Profile**

**For All Users.**This is the part where the user sees their account and personal information. They can also modify it.

**4.4 System Processes**

Figure 10 The IPO system is how the entire system procedure of Document Management System for KTT Office.

**4.5 Development and Testing**

●       **Software Development**

The system development process is anchored to the System Development Life Cycle (SDLC) waterfall model as shown in the Figure. The first phase is the requirement analysis where the developer must determine user expectations for a new or modified product. The second phase is the design of the software, where the developer design and implemented a data structure and algorithms used in the software to produce a detailed data model. The third phase is the design of the system, where the design of the system is easy to use and user-friendly which helps to avoid confusion for users. The fourth phase is the system process, where the procedure outlines the order of specific steps required to achieve a result, and a series of procedures taken together make up a process. The fifth phase is the deployment, where after the system is developed and tested several times, the system needs to undergo a deployment to ensure that the system can perform well and can accommodate the needs of the user in a real situation if there are any glitches or need to improve it can be discussed and take an action immediately. Lastly, is maintenance, where the function of the system must be maintained and secured well to make the system work well.

●       **Hardware Specification**

●       **Software Specification**

                       Shown in the Table 5 is the software specifications for the development of Document Management System for KTT Office.

▪        **Testing**

Testing of the developed Documents Management System was partially done. Unit testing was conducted to ensure that the system functions as designed. Compatibility testing was also done to this system project to ensure that the web-based system can run using different browser such as chrome. The system can be accessible of any devices like laptop, computer, android phones not lower 6.0 android version with an updated browser.

▪        **Description of the System**

      This system project is a web-based program; the system is fully functioning and it is user friendly to all users. The front end of the system utilizes PHP and other frameworks for web programming. The researchers also used jQuery Ajax without loading the web page, and Visual Studio for coding. The developed system is web-responsive and data-driven powered by MySQL for database functionality.

      This system's feature can create, edit, update, delete and upload the users studies. This system can also evaluate the proponents project proposal to project implementation. This system will easily track down any studies.

**IMPLEMENTATION PLAN**

**Implementation results**

This section explained the implementation results of a capstone project for Document Management System for KTT Office. The Project followed the System Development Life Cycle (SDLC) waterfall model, with phases including analysis, design of the software and system, system processes, deployment and testing, and maintenance. The hardware and software specifications were detailed, including a minimum requirement of an Intel core i3-i5 computer with 8GB RAM, 900 GB, and Windows 10, as well as software such as Visual Studio Code, PHP, HTML, CSS, Ajax, MySQL, and phpMyAdmin. The system is described as a web-based program that is user-friendly and responsive, and the implementation plan we presented in a diagram. The system process also mentions that testing was conducted to ensure the system's functionality, reliability, usability, efficiency, maintainability, portability, security, and compatibility and that the system can be accessed with devices such as laptops and smartphones. The developers got the result through the use of information and descriptive system ISO 25010 evaluation.

**USER GUIDE**

**For Maker/Innovator**

* doesn't have an account, they should click *"Sign Up"* so that they can log in to the system.
* The maker should fill up all the credentials then click the button submit.

**Forgot Password**

* To Forgot Password click the button.

**Verification**

* If the maker or innovator login to the system the *Dashboard* is the first they can see.
* To submit a study the maker should click *View Studies* and Click the button *Add New Study.*After clicking the *Add New Study* the maker should input data like the *Document Title, Proponent, Type of technology*it can be *Chemical or Non – Chemical, Type of Intellectual Property*it can be *Patent, Copyright, UM, and Industrial Design, College,*and*Contact Information,*then*Choose file*after choosing*Submit.*
* If you want to delete your study just click the icon delete then *Delete.*

If the user get wronged in sending his/her

* study or they input wrong informations they can update by clicking the icon pencil then *Save Changes.*
* If the maker want to view *Log Submission* just click it to monitor his or her study.
* If the Patent Drafter send for example Formality Result to the maker, just click *View Documents,*then in the left sife click the title of your study. Then above that you can see the uploaded file by patent. You can view that file however it is not supported in MS Word it is for PDF File only but you can download that file by clicking the icon download to view that file. Then you can message the Patent Drafter then hit enter or click the small icon in the right side.
* To view or update your information click the small icon above, then click *Profile,*then after updating your informations just click the *Save Changes.*
* To log out your account just click the small icon then click *Sign Out.*

**For Patent Drafter**

***Important Note:****For Non – Chemical Patent Drafter same process to Chemical Patent Drafter that they only manage or handle those study who is in Chemical.*

* If the Patent Drafter don't have already an account just click *Sign Up* then choose *Patent drafter* in the first dropdown in the second dropdown of *Type of Technology* it depends to the user if he or she choose *Chemical*or *Non – Chemical.*
* After that input your Email Address and Password then click *Submit.*
* If you forget your password just click *Forgot Password.*
* Input your Email Address to get the OTP Code, then click *Continue.*
* Then input the OTP Code you received by your email address then *Submit. (If the code was expired just click resend to received updated OTP Code).*
* If the Patent Drafter login to the system the *Dashboard* is the first they can see.
* Click *View Submission*to view, download, accept or decline the makers study .
* If the Patent Drafter saw some grammatical errors but almost good and he or she want to update your study just click the download icon to edit the study. After that click the upload icon then *Choose file,*then you can send *Feedback* to maker then click *Submit.(And the maker will notify that his or her study is accepted)*
* Another way of accepting the study of maker is just click the icon "*check*" then if the IPOPHIL send a file for example Formality Exam Result to drafter. The Patent Drafter will send also a Formality Exam Result so that the maker can monitor his or her study. To upload file jud click *Choose File,*then click the icon check then click the button *Done.*
* To decline the Study of a Maker just click the icon "*X*" then you need to send *Feedback* then *Submit.*
* To see the message of a Maker just click the button *See Feedback.*
* Click the title of the maker then you can reply his or her message also then click the small icon or click enter.
* If the Patent Drafter received Acknowledgement Receipt from IPOPHIL just click the icon pencil then *Choose file,* click the icon check then *Close.*
* Click *Log Submission,*then *Add New Record*then input all the data information click *Next* then *Submit.*
* To view or update your information click the small icon above, then click *Profile,*then after updating your informations just click the *Save Changes.*
* To log out your account just click the small icon then click *Sign Out.*

**For Admin or Director**

* Input Email Address and input Password then click *Submit.*
* If the maker or innovator login to the system the *Dashboard* is the first they can see.
* To view the staus just click *Log Submission.*
* To view who submitted a study in the system just click *View Submission.*Then you can send feedback also just click *See Feedback.*
* Click the title of the maker then you can reply his or her message also then click the small icon or click enter.
* To view whose study is accepted just click *Accepted Studies.*
* To view or update your information click the small icon above, then click *Profile,*then after updating your pieces of information just click the *Save Changes.*
* To log out your account just click the small icon then click *Sign Out.*