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SEGUE MEDIRECORDS

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Carl Vincent L. Kho

Abstract

Cebuano doctors continue to use pen and paper for the storage of patient information. This is expensive–both in an environmental and financial sense. Electronic Medical Records (EMR) adoption in Cebu is not accomplished by small-scale clinics due to the steep learning curve. In a pandemic like COVID 19, patient information is vital. Currently, doctors are using vulnerable platforms like Facebook to store their patient information because of its simplicity and accessibility. Thus, Segue MediRecords, a mobile EMR solution built on top of Notion was developed. This paper identifies the effectiveness and security of the said EMR solution with the help of doctors, lawyers, and an industry-standard product test called the Systems Usability Scale (SUS).

Researchers hypothesized Segue MediRecords to have a final SUS score of 68 or a C when compared to academic grades. The team asked compliance lawyers and the cybersecurity head of Notion liability questions. Doctors were immersed in Segue MediRecords and validated medical forms used and features added. It scored an acceptable SUS rating of 69 or a B-. The web/mobile EMR was advised to switch from its current SOC-2 security system to one that is HIPAA-eligible.

These results suggest that Segue MediRecords, with a minor modification on security, can be used by doctors today. On this basis, further

research into enabling accessibility so that doctors will have an easier decision to make the switch–especially those in rural areas.

Keywords: Electronic Medical Records, Systems Usability Scale, COVID-19, Information and Technology, Health Insurance Portability and Accountability Act (HIPAA)

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Chapter I

Background of the Study

An electronic health record is defined as an electronic version of a medical history of the patient as kept by the health care provider for some time period and it is inclusive of all the vital administrative clinical data that are in line to the care given to an individual by a particular provider such as demographics, progress reports, problems, medications, important signs, medical history, immunization reports, laboratory data and radiology reports Centers for Medicare and Medicaid services (2012). Use of paper as a means of recording health data in most healthcare facilities and organizations has led to an extensive paper trail and most organizations have developed interests in shifting from paper-based health records to electronic health records. Carey et al. (2016) explains that integrated health records are much more effective and have more benefits such as lowering costs, improving health care quality, promoting evidence-based medicine usage and helping in record keeping and ensuring mobility of the records. To remain effective, an electronic health record system must satisfy some requirements such as achieving complete data, resilience to failure, be highly available and be consistent with security policies (2011). However, there are a number of factors that have hindered the application of

electronic health records. They include funding technology, some aspects of the organization and attitude.

According to Nieva (2020), the COVID-19 pandemic emphasizes the need of the health information system (HIS). It has revealed the flaws in the country's overall HIS and how the Department of Health (DOH) has dealt with them. Electronic medical records, or EMRs, are a technology solution that offers a variety of options to healthcare professionals. EMRs have shown to be important in the success of technology integration in medical care delivery across the world (Gupta, 2014). EMR's integrated solutions solve the recurrent difficulties connected with manual processes of medical services delivery by decreasing costs, achieving accuracy, improving patient care, and data exchange. By digitizing medical records, clinicians may gather, exchange, and retain patient medical data that is required for better medical service delivery (Ayanso, et al., 2015). The data collected by EMRs is made available to other medical personnel and auxiliary services such as labs and pharmacies (Hassan, et al., 2018). Prior research studies have continuously underlined the need to reform the HIS.

According to Keenan (2016), some face numerous difficulties with medical electronic records (EMR) , including security risks, physician burnout, interoperability, and cost. Due to the obvious absence of security, even if the patient's information is confidential, it can be hacked. Physicians

may experience burnout as an outcome of the use of medical electronic records (EMR) because encoding a record takes longer when it comes to clerical-type data entry. A specialist must be involved in the training and orientation of medical professionals to acquire the knowledge of electronic medical records. Furthermore, some studies explained that the modernization of electronic medical records could be complex and expensive.

Resuming clinic operations during a health crisis requires quick access to large and timely volumes of patient information with goals of providing timely and appropriate information to doctors since there are also a multitude of diseases requiring care apart from COVID-19. However, as interviewed by the researchers, doctors in Cebu city are discovered to be still using paper for recording patient information. The researchers address the need for quickly securing, digitizing, and centralizing patient data so that doctors may gain access to quality data by building on top of a current solution: a project management tool called Notion. For this innovation, this tool is merely tailoring Notion to provide the information doctors look for.

These technologies would enable health personnel to prioritize individuals in need of emergency care and quarantine. Furthermore, telehealth technology might connect healthcare practitioners with many more asymptomatic individuals, reducing needless trips to emergency

departments. This would greatly reduce unnecessary traffic and frequent communication between personnel and patients. According to Adane (2013), data processing, communication, efficiency and effectiveness of patient information access, confidentiality, ethical and/or legal concerns all need the use of an electronic health record (EMR). Clinical records facilitate and encourage communication among service providers, resulting in improved healthcare quality. The quality of records reflects the level of care provided to patients. Paper medical records are sometimes difficult to see and interpret because of the physician's poor penmanship. Similarly, paper records frequently lack adequate room for healthcare practitioners to record all required data. Electronic documents, on the other hand, are frequently written in a uniform typeface and vocabulary, reducing the possibility of misunderstanding. According to Jackson from the State University of New York, College of Optometry (2009), based on individuals, tasks, and the influence of sequence, regression analysis revealed statistically significant differences. The difference between EMR and paper was found to be statistically significant (T=11.75, p0.01), with the EMR taking 162 seconds longer on average to finish than paper.

Statement of the Problem

This study is aimed to discover the effectiveness of Segue MediRecords in its task to provide, replace, and/or supplement the current patient records system (paper or electronic) of chosen doctors around Cebu City in attempts of increasing efficiency. Its primary goal is to digitize and centralize patient data, enabling easier access for doctors all around. To aide in further development of this innovation, the following questions were asked:

1. What are the features included in Segue MediRecords?
2. What is the extent of the liability and cybersecurity of Segue MediRecords?
3. What do doctors think about Segue MediRecords as measured by the Systems Usability Scale (SUS)?

Hypothesis

Null

The final Systems Usability Scale (SUS) score of Segue MediRecords is below 51 or the failing score.

Alternate

The final Systems Usability Scale (SUS) score of Segue MediRecords is equal to or more than 68 or the average score.

Scope and Limitations

This study focuses on the effectiveness of Segue MediRecords to provide digitized and centralized patient data for doctors all around the Province of Cebu. The pilot testing for Segue MediRecords will be conducted from October to November 2021 with the 10-15 doctors currently working in the Province of Cebu with the use of Google Forms, Hotjar, and Notion. This research aims to answer the following problems: a) What doctors think about Segue MediRecords in terms of its simplicity and effectivity; b) How Segue Medirecords differ to current systems in terms of cost, complexity, and shareability; c) The features included in Segue MediRecords.

Initially, the research questions will be restricted solely by the above-mentioned scope of the study. However, after expanding on the theory (see chapter 1: conceptual framework), more constraints may be introduced to further specialize the research.

Conceptual Framework

Segue MediRecords has three major components as of version 0.0.3, September 27, 2021. The components: Dashboard, Medical Records, and the COVID Monitoring section will be further explained with the help of text and diagrams below.

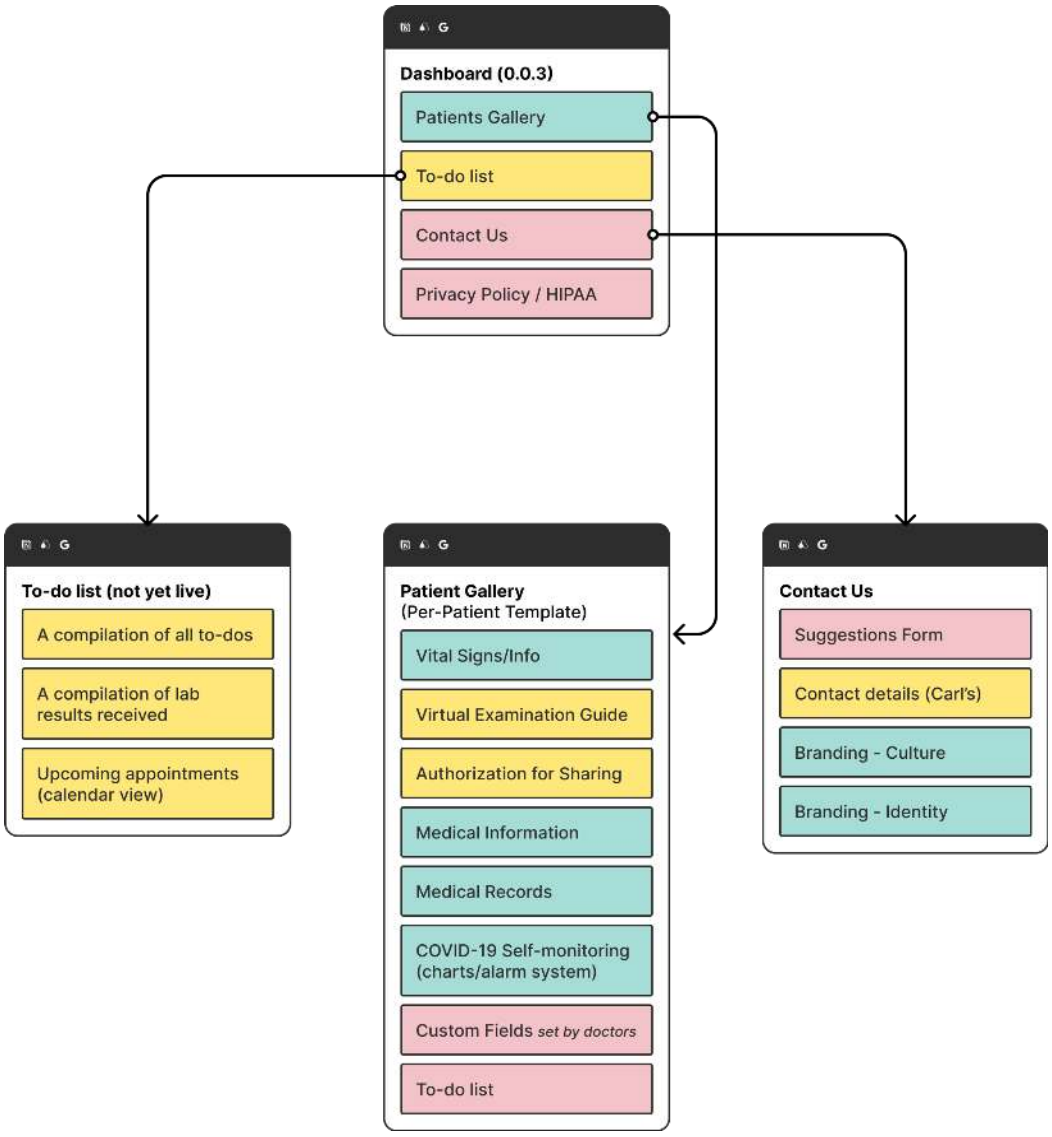


Table 1.1 the diagram for the dashboard of Segue MediRecords

In the dashboard, the home page, doctors are met with three major components of Segue: the patients gallery, their to-do list, and the contact us section. From there, doctors can choose a patient to access their information. Every patient card in the patient gallery contains the following: basic information, virtual examination guide, information authorization form, additional medical information, medical records, COVID-19 tracking, custom fields, and a to-do list.

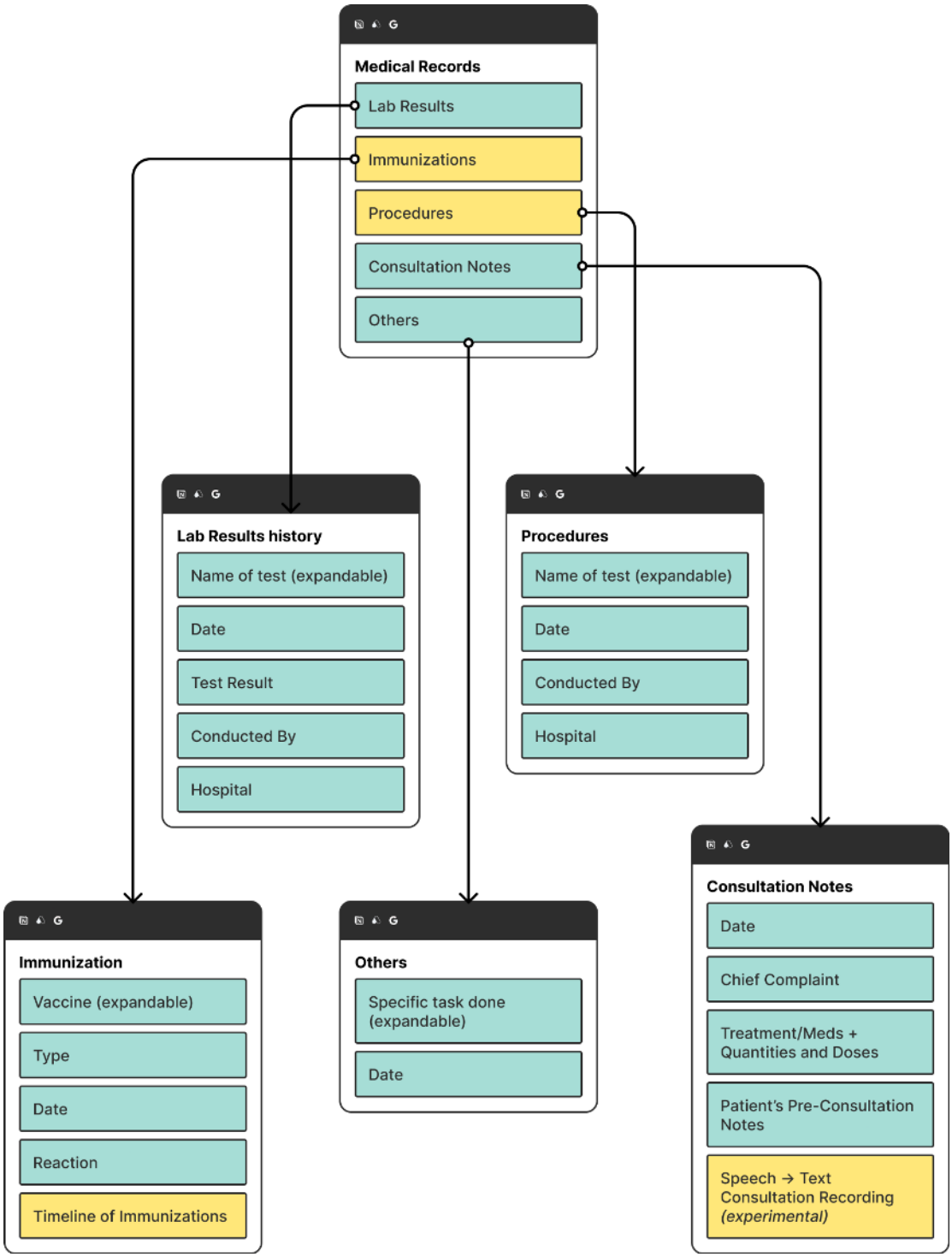


Table 1.2 the diagram for the patient records section of Segue MediRecords

Keeping a patient's medical history up to date is one of the important data to keep as these will help doctors in their consultation when making big decisions for the patients. Aside from logging, extra information can be accessed when required.

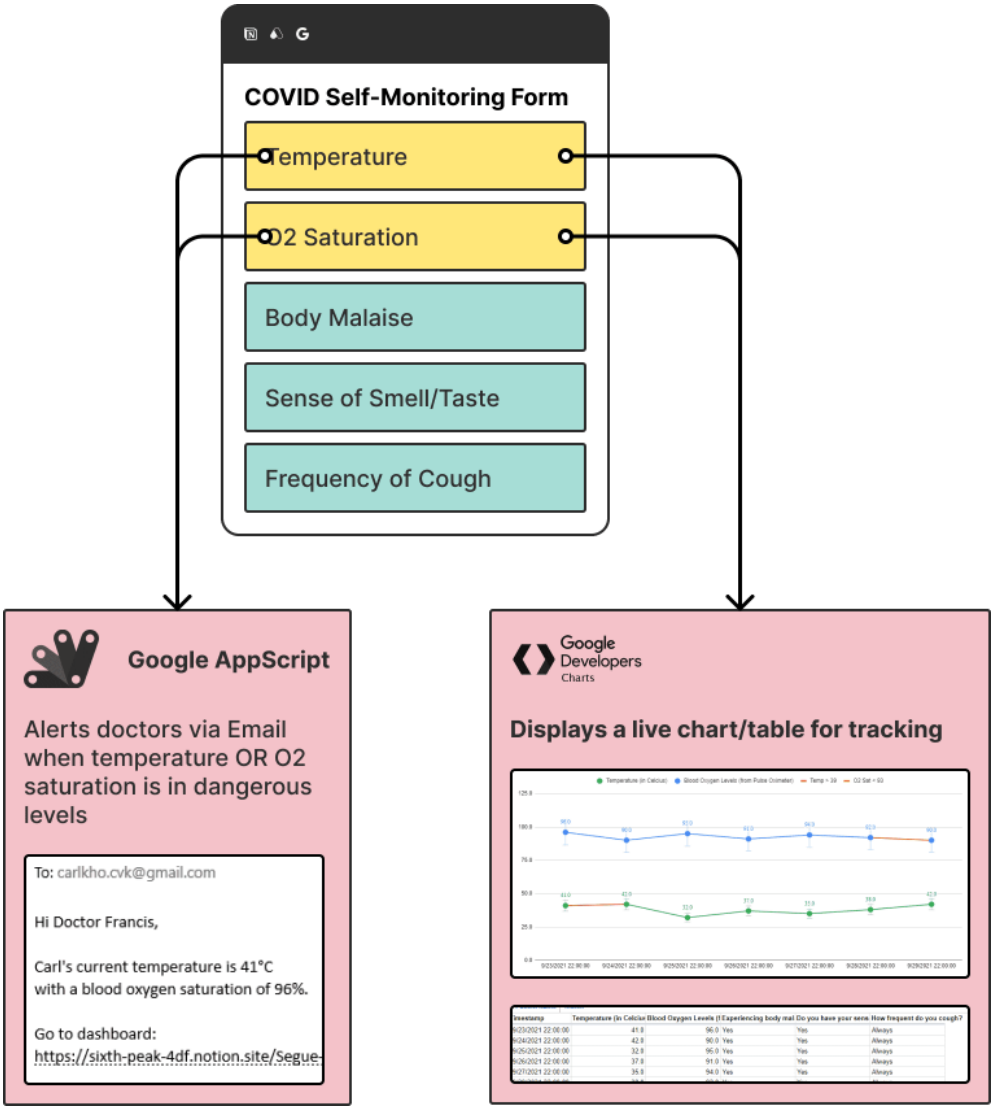


Table 1.3 the diagram for the COVID section of Segue MediRecords

COVID-19 patients must frequently update their doctors about their temperature and O2 saturation. This is usually done through SMS which means it can be lost in the middle of the many messages patients and doctors send to each other. Segue MediRecords includes a self-monitoring form as well as an alarm system that triggers whenever a patient’s temperature or O2 saturation fall into dangerous levels.

Significance of the Study

This study is beneficial to the following:

Medical industry. This study can help to justify how the growing trend of paperless transactions is more feasible and reliable in the medical industry. With this, doctor-patient appointments, as well as transactions in hospitals will be more systematic and fast while more patients will be accommodated.

Medical Professionals. This study will lessen the burden of medical professionals on delayed medical transactions due to lack of documents and increase their efficiency. Moreover, this will save time for medical professionals waiting for documents needed before any medical process starts.

Patients. This study will also benefit the patients in terms of convenient transactions. Also, archived documents will be easily recovered for the patients to inform the hospital that the patient has a record on the hospital which will serve as a guide for any necessary medical intervention to the patient.

Department of Health (DOH). This study can also be proof for the Department of Health on the consideration of implementing paperless

transactions to the hospitals in the Philippines for development on transactions and as a response to health and safety protocols amidst and after the Covid-19 pandemic.

Researchers. This innovation can inspire researchers by providing grounds where data management is counted as an innovation. A launchpad for innovations revolving around big data—technology that will maneuver the future as the world goes digital.

Community. This study will benefit the community in terms of public health safety and convenient transactions. Paperless transactions will increase the speed of processing documents as the need to look for medical history files will be faster and forwarding of documents to the necessary offices will be easier and faster.

Future Researchers. This study may be used as a reference to help future researchers in gathering information for their studies that will be used as secondary data to generate new study ideas based on this research. This investigatory project will be cited and referenced in their own research projects.

Definition of Terms

To fully understand the terms used in this study, they are defined operationally:

Centralized patient data - This refers to patient data to reside on a single mainframe but be accessed from multiple locations.

Cost - This refers to the cost comparison of the proposed project vs the current medical record system.

Effectivity - This refers to how effective and reliable the proposed project is in terms of its usage.

Electronic Medical Records (EMRs) - It refers to digital versions of the paper charts in clinician offices, clinics, and hospitals which contain notes and information that are mostly used by providers for diagnosis and treatment.

HIPAA - This refers to The Health Insurance Portability and Accountability Act of 1996 (HIPAA) a federal statute that mandated the development of national guidelines to protect sensitive patient health information from being disclosed without the agreement or knowledge of the patient.

Medical records - It refers to a record of a patient's medical information (as medical history, care or treatments received, test results, diagnoses, and medications taken)

Notion - An all-in-one workspace where you can write, plan, collaborate and get organized - it allows you to take notes, add tasks, manage projects & more.

PHI - This refers to any information about a person's health status, health-care service, or health-care payment that is developed or collected by a covered entity or a business associate and can be linked to that person. PHI is personal health information that is kept private. The HIPAA Privacy Act of 1996 protects a subset of personally identifiable information (PII).

Segue - This refers to seamlessly transitioning from one activity, topic, scene, or component to another.

Shareability - This refers to how the project is shareable to other people compared to the existing medical record system.

Simplicity - This refers to how easy and convenient it is for doctors, patients, and hospitals to use the proposed project.

SOC Type 2 Security - This refers to an internal controls report that details how a corporation protects consumer information and how well those controls are working.

Chapter II RRL

Doctors and Access to Patient Information

To recognize the complexities of the rising digital fitness report device and identify what the health data device is now and desires to become. The scientific report, both paper-primarily based totally or digital, is a conversation device that helps medical choice making, coordination of services, assessment of the pleasant and efficacy of care, research, prison protection, education, and accreditation and regulatory processes. It is the commercial enterprise report of the fitness care device, documented in the regular route of its activities. The documentation needs to be authenticated and, if it's far handwritten, the entries need to be legible.

The doctor-patient connection has been and continues to be a critical component of care. According to Putnam, the medical interview is the most common kind of healthcare communication. Most of the time spent in a medical encounter is finished in a conversation between the practitioner and the patient. Gathering information, establishing and sustaining a therapeutic connection, and conveying information are the three purposes of the interview. These three roles are intertwined intimately.

According to Tolentino, Marcelo, and MaraDuringe, the Philippines' delivery of health care services was delegated to local government entities in 1998 as part of the Department of Health's Health Sector Reform Agenda

(HSRA). During the devolution process, there’s not enough time to delegate health information management responsibilities to local government units (LGUs) so that they can gather, integrate, and display data in a smooth, dispersed, and coordinated way. On the other hand, national vertical health programs remained in existence, each with its own set of logbooks, reporting forms, and procedures, as well as staff. Child Care and Development, Maternal Care, the National TB Program, Family Planning, and the Expanded Program for Immunization are among the Philippine vertical programs. Data input of patient information across multiple logbooks in busy community health clinics may be inefficient, resulting in duplicate and incorrect entries.

Patients and Access to Personal Health Information

The Health Insurance Privacy and Portability Act (HIPAA) requires that patients view and amend their medical records. As information technology makes it more accessible to patients, patients can refer to their charts more often.

Two international studies show which sections of the medical record people thought were especially significant. According to Liaw, general practice patients in Australia were polled on what should be included in a patient-held record. Patients requested that it contain information on vaccinations, medical issues, allergies, and treatments. And according to

Jones, McGee, and McGee, patients were monitored while they saw their shortened medical data on a computer screen. Most patients examined their issue list, approximately half examined their prescription list, and one-third examined their clinical evaluation.

According to Carter, Cimino, Shenkin, and Kirby, a patient-accessible medical record can enhance medical treatment in many ways, primarily through improving doctor-patient communication. According to the Institute of Medicine study "Crossing the Quality Chasm," improving information flow between patients and medical providers may help decrease mistakes and enhance quality.

On the other hand, medical practitioners have expressed concerns about routinely providing patients with access to written documents that are not intended for a lay audience and may contain relevant information that is still inappropriate to reveal to the patient, according to Fairweather and Rogerson. Both for and against unrestricted patient access to the record have been made on ethical grounds.

In the Philippines, the Electronic Commerce Act of 2000 establishes most of the legislative framework for electronic-based transactions, including electronic health data. A few imaging centers, according to Marcelo, have purchased equipment that can produce digital data. These institutions have given CD-ROMs of their pictures to their patients upon request, which they

may view on a personal computer. Laboratories, on the other hand, often print out test findings on paper. Only a few institutions in the Philippines offer electronic data to their patients due to a lack of a mechanism to receive electronic data from labs. Health institutions, particularly doctors' clinics, do not provide computerized data to their patients, in whole or in part, as is customary. The material is usually in paper format and follows a particular pattern, such as clinical abstracts or medical certificates.

According to Marcelo, most Filipino patients are now unaware that they have the right to copies of their health records and own the records, even if they are in paper format and are maintained by hospitals or clinics. This understanding is critical when engaging patients/consumers in the management of their health data. Patients will entrust the care of their health records to health facilities, which act as custodians of their health data if this right is not recognized.

The current systems in third-world countries are problematic. Patients have long had legal rights to their medical records, but they often had to pay fees, wait weeks, or sift through stacks of papers to see them. Another current problem is that patients can now access their health data online but may not understand it.

Current Processes of recording Lab Results

By definition, a Laboratory Test is a medical procedure that allows medical professionals to obtain a test sample of blood, urine, or other substance from the human body. This will significantly enable doctors to see, evaluate, and determine a specific diagnosis or treatment. At the same time, this helps to monitor a disease easily and see if a particular treatment is working overtime.

In relation, the Laboratory Testing Cycle refers to the process and steps are undertaken between a period where the doctor orders a laboratory test and the period where the hospital obtains the sample tests of the patient. The results are therefore carefully analyzed by the doctor to see the condition of the patient. According to Wians, the laboratory testing cycle consists of three (3) phases: 1.) Preanalytic; 2.) Analytic; and 3.) Post-analytic. The Preanalytic phase generally includes specimen handling issues. As mentioned on the website of LabCE, errors are likely to occur in this phase, considering specimen handling and identification. The healthcare system is becoming increasingly reliant on dependable clinical laboratory services, prone to mistakes as an integrated component of the healthcare system. Hence, specific control measures must be implemented to prevent and reduce any likelihood of errors. Meanwhile, the Analytic phase includes the actual laboratory testing. This also covers all diagnostic procedures,

processes, and relevant products capable of providing accurate results. Finally, the Post-analytic stage issues the laboratory test results of the patient.

Laboratory testing has developed throughout the years due to new and advanced technological innovations invented by humanity. As compared before, laboratory testing now only takes a few hours to be thoroughly analyzed because of the equipment and specific medical instruments.

According to Nylenna and Aasland, being expertly refreshed has consistently been viewed as a moral essential for specialists. Over the long run, it has additionally turned into a proper prerequisite. Deliberate methods of getting the vital data have been created as a component of proceeding with clinical instruction (CME) programs from one side of the planet to the other. Specialists invest a lot of energy in perusing clinical writing and going to congresses and gatherings to stay aware of the clinical information. The capacity to adapt to the clinical data was firmly identified with specialists' prosperity and occupation fulfillment.

Current Processes in recording Immunizations

Vaccines are highly effective in helping build one’s immune system and prevent any natural diseases from infecting them. According to the website of Family Doctor, everyone needs a shot of a vaccine injected into their body.

Once medical facilities refuse to issue vaccines to patients, all contagious and deadly diseases will likely come back and cause more damage. Additionally, newer vaccinations have decreased sickness and hospitalizations in target populations, amplifying benefits beyond their direct impacts through decreased transmission from those vaccinated to other groups. Although most of the twentieth century saw a significant wait between the release of a vaccine in affluent nations and its widespread usage in developing countries, recent global public-private partnerships and lobbying are accelerating the acceptance of new and underused vaccines.

According to Stokley, Rodewald, and Maes, immunization records, also known as Vaccination Records, refer to the comprehensive timeline of all the vaccines a patient has received. Scattered vaccination records severely impair doctors' ability to establish the vaccination status of their patients who had vaccinations at other health care facilities. In a study by Wilson et al., they examined the benefits of relying on a mobile phone application to track the immunization records of the parents’ children. The iPhone application was launched in November 2012, and the proponents recorded a total of 4,867 downloads after 12 months following its launch. Data findings suggest that the downloads were highly correlated with media coverage. The users of the app were also concerned regarding the privacy of their health information. Hence, additional improvements to its features are slowly being

developed. Unavoidable errors might reduce the utility of vaccination tracking data. While some inaccuracies are due to transcription errors, failures to regularly record and disseminate vaccination data can contribute to the inaccuracy of computer-stored immunization records. Switching doctors can also leave a gap, especially in records like these. It is recommended that patients keep and maintain an up-to-date vaccination record in their respective homes to be informed of the records.

Current Processes in recording Procedures

According to Pirie, documentation and record-keeping are critical components of all aspects of healthcare practice, and perioperative care is no different. For some time now, documenting every action or intervention performed on a patient has aided in improving perioperative practice; it has also been critical in resolving legal and professional problems that have occurred. Most medical facilities use two types of record-keeping, namely, Handwritten records and Electronic or Computer-based. There are also times where they use a combination of both. According to Ausmed, a record should be made as soon as possible after the patient is seen or complete the procedure. It’s essential that an accurate description is made in the patient’s notes and should include interventions and any response to the interventions. Keeping track of records offers numerous benefits to the

healthcare system, at the same time, eases the process. Health records should demonstrate good patient care. Records should document any risks or issues that occur and the actions taken to address them.

In a study done by Mutshatshi, Mothiba, Mamogobo, and Mhbombi, they investigated the challenges nurses encounter in public hospitals in terms of record-keeping. Findings show that the nurses working in a public hospital were challenged when it comes to record-keeping. Some factors that affected this were the lack of time to complete the patients' records and an increase in the rate of admissions. That being said, record-keeping is problematic and not being done correctly. Hence, it gives rise to the idea that they should be consistent when monitoring and keeping track of the records. Through this, they will be able to improve patient care, hence, increasing satisfaction and loyalty. According to Zegers, Evidence-based standards and an electronic format for record-keeping are necessary for the standardization of recording patient information. This will improve the completeness, readability, accessibility, accuracy, and exchange of patient information between healthcare providers and institutions. Better registration of patient information will benefit the quality of the healthcare process and will reduce the risk.

Current Processes in recording Consultation Notes

Many doctors and patients choose to audio-record their medical consultations in order to listen to them afterward and share them with family members. Lipson-Smith, Ruby, White, Serong and et al., it has been shown that audio recordings of consultations improve patients' recall and understanding of medical information, as well as their ability to participate in decision-making. Users will be allowed to record their sessions through a hospital-endorsed consultation audio-recording smartphone app. The Theory of Planned Behavior offers a framework for comprehending how patients may be persuaded to audio-record sessions in an acceptable manner. According to Fernando and Siriwardena, The General Medical Council's current guidelines for good medical practice state that all doctors should maintain 'clear, accurate, and contemporaneous patient records that detail pertinent clinical findings, decisions made, the information provided to patients, and any drugs or other treatment prescribed.' While it may be possible to adhere to these criteria in the outpatient environment of general surgery, for inpatients, the daily record of the consultant ward round is frequently prepared by junior doctors. This memo may be the sole contemporaneous documentation of the care procedure. There are currently no objective statistics available to judge the trustworthiness of the documentation of these discussions. The purpose of this research was to

determine the degree of dependability with which the consultant's care plan is recorded in order to establish its validity in current surgical practice.

The way patients are notified of negative news during consultation has a major effect on their anxiety, sorrow, and later adjustment. Despite significant investment in well-researched communication skills training and the availability of decision-making tools, communication difficulties persist in oncology. Information-based treatments include a diverse range of communication aids, including the promotion of pre-consultation question lists, audio-recorded consultations, and note-taking services. These treatments are primarily designed to improve questioning and knowledge recall after the consultation. Both coaching and community-based approaches are great for educating patients on what to anticipate during their consultation, ensuring that they have the skills and confidence to engage completely.

Speech to Text as a tool for consultation documentations

Online services are becoming more essential than conventional services in a contact-free world. Simultaneously, the contact center's function in customer relationship management (CRM) is becoming increasingly critical. According to Lee and Kim, process automation techniques must be used to support CRM jobs and their efficacy. Quality

assurance (QA) is a time- and resource-intensive activity that is well-suited for automation. This article proposes an automated quality rating approach for voice-based consultations. To begin, voice recognition is used to convert consultations' speech to text. Then, quantitative evaluation is conducted using the QA metrics, which includes evaluating the items in the opening and closing mentions, the presence of mandatory information requests, and the attitude toward listening and speaking. 92.7 percent of automated evaluations produce the same outcome as those performed by human specialists. It was discovered that the automatic assessments' non-matching instances were primarily caused by a mistranslated Speech-to-Text (STT) result. With the confidence that STT results provide, this proposed technique may be used to increase the efficiency of contact center quality assurance processes.

Doctors frequently perform their doctoring duties primarily through conversation with patients, and the consultation's medical conclusion may be "exclusively" a conversation between doctor and patient. Natural dialogue academic research is a relatively young field of study. Science has been effective in part because scientists have overcome natural language's bias by investigating objects in controlled isolation as simple, linear, cause-and-effect components of more complex wholes. As a result, dyadic sentences of the form "if A then B'' represent the natural manner of

reasoning in science. Individuals get ill and seek assistance, but no recognized sickness exists. Speech being a component of self-presentation, physicians treat both patients and diseases, and so language is a necessary component of medicine. According to Nessa, academic medicine requires ways for transcribing oral consultations into written texts, which will eventually supplant the conventional and typically unstructured case history presentation. The purpose of these two articles is to make linguistic theory and practices more accessible. The first article is a transcript and study of a consultation in a Norwegian general practice; the second article discusses two language domains, text linguistics and pragmatics, as they apply to doctor-patient interaction.

Electronic Medical Records (EMRs)

Practicefusion states that An Electronic Medical Record is a complete record of a patient's key clinical data and medical history, such as demographics, vital signs, diagnoses, medications, treatment plans, progress notes, problems, immunization dates, allergies, radiology images, and laboratory and test results.

Electronic medical records (EMRs) contain many important data elements that can help with both a pandemic response and a doctor's day-to-day interactions with patients.

Atreja, Gordon, Olmsted, Pollock et al. also stated that Electronic health record systems are primarily clinical in focus, designed to provide patient-level data and provider-level decision support. Hospitals and physicians' offices are gradually adopting electronic health record (EMR) systems, with the goals of improving patient care and outcomes; increasing efficiency and lowering costs; improving billing procedures; reducing the frequency of lost records, data, and medication errors; and providing better access to patient histories [1], [2]. Electronic health record systems can incorporate clinically useful features such as electronic alerts, guideline reminders, and automatic monitoring of quality of care indicators [3].

EMRs vs Paper Systems

Kivatinos explains that integrated health records are much more effective and have more benefits such as lowering costs, improving health care quality, promoting evidence-based medicine usage and helping in record keeping and ensuring mobility of the records. Medical practices maintain paper medical records in vast, paper-filled warehouses. These paper documents take up space and are bad for the environment. Paper records decay over time as well. All of those extra resources and space are no longer required with a cloud-based EMR.

Paper records necessitate the hiring of additional employees to manage paper files and organize a large number of papers. A platform for electronic medical records requires no physical storage space, fewer employees, and less of your time.

Many medical providers only preserve one copy of a medical record on paper, which means that losing a single record could mean losing it forever. Paper documents are also subject to unforeseen events such as a break-in, a staff member misplacing it, or natural calamities such as a fire or flood.

Additionally, when a provider's material runs out of space, they may have to cram information into the margins. Electronic medical records provide you with the space you need to record all of the pertinent details from a medical contact.

Advantages of Electronic Health Records

EMRs and the ability to input and view health information electronically can help physicians provide higher quality and safer care for patients while creating tangible enhancements for your organization. EMRs help providers better manage care for patients and provide better health care by providing accurate, up-to-date, and complete information about patients at the point of care; enabling quick access to patient records for more coordinated, efficient care; securely sharing electronic information with patients and other

clinicians; helping physicians more effectively diagnose patients, reduce medical errors, and provide safer care; improving patient and physicians interaction and communication, as well as health care convenience; helping promote legible, complete documentation and accurate, streamlined coding and billing; enhancing privacy and security of patient data; helping physicians improve productivity and work-life balance; enabling physicians to improve efficiency and meet their business goals and; reducing costs through decreased paperwork, improved safety, reduced duplication of testing, and improved health.

The difference between an EMR and an EMR

Practicefusion explains that an electronic health record, or EMR, is a digital record of health data. It includes everything you'd find on a paper chart, plus a lot more. Past medical history, vital signs, progress notes, diagnoses, prescriptions, vaccine dates, allergies, test data, and imaging results may all be included in an EMR. Other relevant data, such as insurance information, demographic data, and even data imported from personal wellness devices, might be included.

What Is the Difference Between Electronic Medical Records and Electronic Health Records?

When you consider the terms "medical" and "health," it's easy to remember the difference between EMRs and EMRs. An EMR provides a more limited perspective of a patient's medical history, whereas an EMR provides a more comprehensive picture of the patient's overall health.

As noted under the differences between EMRs and EMRs, this project primarily focuses on giving information about a patient but is only used by one person. Unlike EMRs, which allow them to share information with approved individuals.

Current Solutions for Patient Information Storage

Patient information storage was developed to keep track of medical information. Systems that gather, store, manage and transmit a patient's electronic medical record (EMR), a hospital's operational administration, or a system that supports healthcare policy decisions are all examples of this.

International

Blockchain for Healthcare

According to Daley, the United States will spend 20% of its GDP on healthcare in the not-too-distant future. Given that the company continues to be plagued by growing healthcare costs, inefficient operations, and frequent data breaches. These high-cost challenges have prompted a drive for greater efficiency and innovation.

Blockchain in healthcare could help alleviate the pain by deflating the present expenditure bubble, protecting patient data, and improving the overall experience. The technology is already being used to perform everything from encrypting medical data to controlling disease outbreaks. And at least one country sees blockchain healthcare as having a lot of potential: Estonia.

In healthcare, blockchain has a wide range of applications and functions. The ledger technology helps healthcare researchers uncover genetic code by facilitating the secure transfer of patient medical records, managing the drug supply chain, and facilitating the secure transfer of patient medical records.

Estonia, a country the size of Tennessee with a population the size of Maine, began adopting blockchain technology to secure healthcare data and conduct transactions in 2012. All of the country's healthcare billing is now done on a blockchain, and 95 percent of health data is now stored on a ledger, with 99 percent of all prescription data being digitized.

As stated by Frontenders, the healthcare business is swamped with data from every end: outpatient department case sheets, critical care unit surgical reports, radiology and testing laboratory scan findings, to name a few. Several hospital data storage alternatives are being investigated with the use of healthcare information technology in order to achieve effective data management.

Healthcare database management solutions with easy access, rapid latency, strong security, and maximum storage capacity are in high demand. This is why hospitals are enlisting the assistance of a seasoned healthcare consulting firm to meet these demands with solutions like these.

Storage Area Networks (SAN)

The Storage Area Networks (SAN) option is used by 67 percent of major hospitals with more than 500 beds for data storage. A SAN is a high-speed data storage network that uses a dedicated fiber channel pipeline to connect various types of storage devices with associated data servers. As a result, photos and data can be sent straight from storage to workstations on the pipeline, freeing up resources on the main server. This frees up bandwidth and allows patient-related data to be transmitted more quickly.

The use of SAN to enable all PACS-(Picture Archiving and Communication systems) has become extremely vital as the requirement to communicate more diagnostic data has developed.

External Storage Devices

According to statistics, 62 percent of hospitals employ external storage media such as tapes and disks as a data storage alternative because they don't require any installation. External hard disks or SSDs are used in hospitals to store patient records, electronic medical records (EMR) and backups, radiological pictures, insurance claims, and office documents, among other things.

All external storage devices used in healthcare must be data encrypted to protect them from malware and hacking, notwithstanding how simple they are to use.

Network-Attached Storage System (NAS)

The hospital's massive amount of data necessitates both high performance and rapid data interchange, as well as strict security. 45 percent of hospitals use a Network-attached Storage solution to meet this need (NAS).

NAS stands for Network-Attached Storage, and it allows various users and devices to access and retrieve data from a central storage capacity. Users on the LAN can access the NAS via Ethernet because it is an independent network node with an IP address on the LAN. Because NAS systems lack a keyboard and display, they must be configured and controlled through a browser-based application.

For hospital networks with huge volumes of business data spread over multiple branch locations, NAS is the chosen storage solution. The benefit here is that because NAS connects multiple servers, it's simple to recover data and restore lost data across the network.

Outsourcing Storage/Vendor Solutions

Currently, 26 percent of hospitals use vendor-provided outsourced storage systems. This is due to the fact that data storage accounts for half of a hospital's IT expenses, which can be dramatically cut to half by outsourcing data storage.

Outsourced vendor solutions are used to store anything from electronic medical records to e-prescriptions, lab and pharmacy information, and so on. The benefit of choosing an outsourced storage solution is that it reduces overhead and allows for faster disaster recovery. However, the drawback is the danger of data security, which must be clearly stated while drafting the service contract.

Cloud Computing

Currently, 24 percent of hospitals have moved their data storage to the cloud. The Cloud environment is perfect for healthcare information management since it provides both storage and security, as well as latency and privacy, according to the hospital's requirements. With the development of public, private, and hybrid Cloud models, hospitals can choose to keep some critical data on-premise while storing other data that is rarely accessed in the Cloud.

With so many alternatives, it's ideal for hospitals to get advice from a healthcare consulting firm when choosing the best data storage solution.

Paper Medical Records

As stated by Gonçalves and David, medical data generated in hospitals is utilized in a variety of ways, including (1) to assist patient care, (2) in research conducted by internal and external health experts, and (3) as legal proof for a variety of purposes. The storage of huge numbers of retrospective paper-based patient records, the coexistence of electronic and paper health information, and the integration limits of numerous computer systems are all major challenges for So Joo Hospital Center (SJHC). These issues must be taken into account when implementing an Electronic Patient Record (EPR) to guarantee that hospitals and patients reap the full benefits of technological expenditures. This chapter's contribution is the design and execution of a (re)use study, which included an examination of the paper-based records management operations as well as the content of the patients' records. A survey was conducted to define the (re)use of paper-based patient data in terms of objective and kind of hospital visit, and documents accessed were recognized and grouped in an access frequency table. The findings backup SJHC's plan to install paper-based patient records as part of the hospital's EPR adoption effort.

Truenorth states that medical records are a collection of self-reported patient data and clinical diagnostic notes that have historically been kept on paper.

The Benefits of Keeping Medical Records on Paper

Reduced Upfront Costs

All you need to get started with paper medical records is paper, files, and a closed cabinet to keep everything safe. That won't cost nearly as much as a high-end electronic health record (EMR) system, which necessitates cloud servers and other high-tech equipment.

Similarly, large training programs are not required to upskill nurses and doctors in the subtleties of administering electronic health systems. These expenses are incurred during the adoption of an electronic health record (EMR) and the onboarding of a new healthcare practitioner.

Ease of Use in a Familiar Format

There's a reason why paper medical records have been a mainstay of the profession for decades. It's simple to retrieve data from a file, go over prior notes and medical records, and make fresh observations.

Reading charts and notes on paper might be less complicated if the information is stated accurately. To access data, you must utilize software and enter the necessary keywords and user IDs. Not everyone is tech-savvy or capable of learning a new system.

Physical Form Factor

Slow loading times and unfamiliar interfaces may waste valuable minutes when nurses search databases using keywords and scroll past several screens to get prior records when time is of the importance, such as when many trauma patients require rapid attention.

In this regard, paper records are advantageous: a physical file including all prior charts and medical history neatly organized in one location. Furthermore, the data can be smoothly shared from one individual to another. All of this, of course, is contingent on the prior notes being well-written, well-organized, and easily accessible.

Easier to Customize

Another benefit of paper medical records is that they may be customized to meet the needs of each hospital or practitioner without requiring any technical changes. Simply create one using a basic text editor, and you're ready to go.

Electronic health records, on the other hand, will necessitate the use of a software developer to make changes to the code and back-end systems. This is both time-consuming and expensive.

Local

According to National eHealth Governance**,** health data and information may now be transferred electronically between healthcare providers because of the advancement of information and communication technologies. Furthermore, the adoption of internationally recognized standards, as well as transmission and validation methods that safeguard client privacy and data security, has made the exchange safe.

A client now receives healthcare services from a variety of sources, including rural health units (RHUs), government and/or private hospitals, and private clinics. The information is kept in the health-care facility where services were provided. Rather than having to access the client's health encounter record from previous health facilities, healthcare providers typically acquire anecdotal information from previous health encounters utilizing the traditional approach of employing paper forms. This scenario frequently results in redundancy and additional setbacks for the client, such as repeating diagnostic procedures that may have already been facilitated in previous health encounters, duplication of treatments, inappropriate medication prescription due to a lack of information on allergy triggers, and/or incorrect diagnosis due to insufficient health history, to name a few

examples. These issues can be avoided or minimized if healthcare providers have access to up-to-date, accurate information at all times.

The creation and implementation of the Philippine Health Information Exchange, guided by the PeHSP for UHC, is one of the recognized key eHealth projects to address the above situational health condition (PHIE). In the interest of public health, the PHIE is a platform for safe electronic access and efficient exchange of health data and/or information across health institutions, health care providers, health information organizations, and government agencies. The PHIE is expected to become a vital part of the health-care delivery system, with all patients having access to its services. It will combine and unify health data from various electronic medical records and hospital information systems. It will create a platform for health-care professionals to share data and information, as well as support access to patient records among providers in all parts of the country, thereby increasing the efficiency and reliability of communication among them. In general, its implementation will boost public health, improve total patient care, and improve decision-making while protecting each individual's right to privacy.

The PHIE responds to the national government's call for a citizen-centric government, with the Secretary of Health, the Secretary of Science and Technology (DOST), the President and Chief Executive Officer of

PhilHealth, and the Executive Director of the DOST-ICT Office (now Department of Information and Communications Technology) signing a Memorandum of Agreement on its manpower on March 17, 2015. From the perspective of the health sector, PHIE helps to achieve UHC by fostering good governance, strengthening accountability, increasing transparency, and advancing operational efficiency among various stakeholders in the health sector, as well as delivering quality services and making information available to various service providers and the general public.

Standards in EMR

Electronic Medical Records have the potential to provide significant benefits to physicians, clinic practices, and healthcare organizations. These solutions can help with productivity and improve patient care while also ensuring patient safety.

International

National Committee for Quality Assurance (NCQA) Health Plan Accreditation states the medical record documentation commonly accepted standards are: (1) The patient's name or ID number appears on each page of the record. (2) Address, employer, home and work phone numbers, and marital status are all included in personal biographical data. (3)The author's name appears on every entry in the medical record. A handwritten signature, a unique electronic identity, or initials can all be used to identify the author. (4) Each entry is dated. (5) The record can be read by someone who isn't the author. (6) The problem list includes a list of significant illnesses and medical disorders. (7) Allergies to medications and adverse responses to medications are conspicuously mentioned in the record. This is adequately noted in the record if the patient has no known allergies or a history of adverse reactions. (8) Past medical history is clearly identifiable

(for patients visited three or more times) and includes significant accidents, procedures, and diseases. Past medical history for children and adolescents (18 years and younger) includes prenatal care, birth, operations, and childhood diseases. (9) There is a suitable note regarding the use of cigarettes, alcohol, and other substances for patients aged 12 and up (for patients seen three or more times, query substance abuse history). (10) The history and physical examination uncover relevant subjective and objective information about the patient's current complaints. (11) As needed, laboratory and other examinations are requested. (12) The working diagnosis matches the findings. (13) The treatment plans are in line with the diagnoses. (14) When indicated, follow-up treatment, calls, or visits are noted on encounter forms or notes. The return date is specified in weeks, months, or as needed. (15) In subsequent sessions, unresolved issues from earlier office visits are addressed. (16) There is an evaluation to see if consultants are being used inefficiently or excessively. (17) If a consultation is requested, the record should include a note from the consultant. (18) The practitioner who ordered the consultation, laboratory, and imaging reports initials them in the chart to indicate that they have been reviewed. (This need is not met by having professionals other than the ordering practitioner review and sign.) There is also a representation of evaluation by the ordering practitioner if the findings are given electronically or through

another way. In the record of follow-up plans, consultations and aberrant laboratory and imaging research results are explicitly noted. (19) There is no indication that a diagnostic or therapeutic technique puts the patient at unnecessary danger. (19) A current immunization record (for children) or an adequate history in the medical record (for adults) has been produced, and (20) Preventive screening and services are provided in accordance with the organization's practice guidelines.

Standards

Authenticity and Confidentiality

Passwords should never be shared. Users are not permitted to chart in a medical record that has been opened with another person's password, and you must use the suspend or log out option when leaving electronic PHI unattended.

Authorship Integrity

The author will time and date stamp each entry in the patient record (the password that opened the chart.) Unless attribution is supplied, it is not permitted to replicate patient-specific documentation from another source.

Documentation Integrity

Documentation must be specific to a patient's condition at the time of their interaction and must accurately depict the services provided to that patient as well as the date of service. Clinically appropriate standards of practice must be used to create templates. Providers may not be able to exchange patient-specific autotext and macros. To reflect current discoveries, macros, auto texts, and pre-completed notes must be modified, updated, or confirmed. Patient-specific information should never be included in pre-written notes. When entering entries into the medical record, documentation must indicate a positive or active choice. Checking a box, picking templated documentation pieces, inputting free text, or selecting from a drop down menu are all examples of positive options, and all processes must have patient-specific unique entries documented in the templates.

Appropriate use of Copy Functionality

Medically necessary, relevant to the patient, and services supplied for each day of service, entries carried forward from a patient's previous visit(s) must be medically required, relevant to the patient, and services delivered for each date of service. Each entry must be double-checked for accuracy and appropriately modified. It is not permitted to copy entries from one

patient to the next. The medical student note type must be used to document medical student notes. Medical student notes must be ascribed to the medical student and limited to the Review of Systems and Past Family Social History. Only if the History of Present Illness (HPI) is updated with interim history can it be copied forward, and the note's other elements may only be copied forward if they have been updated, changed, or confirmed to reflect current findings.

Coder Integrity

Providers and Coders are in charge of choosing the CPT and ICDCM codes that most accurately reflect the medically required services they have performed and documented. Decision-making logic that says CPT codes should only be used as a guide. It is the provider's responsibility to choose the correct CPT code.

Standards in the Philippines

75health states that the invention of new electronic devices has radically altered the world. Smartphones, tablets, iPads, and other mobile devices have become indispensable in the exchange of sensitive data. The medical service is supplemented with information, which permits the development of applications that can be utilized across a variety of electronic

devices to provide patients with safe and prompt medical care. The use of an EMR system has changed processes that were previously limited to a smaller sector, bringing the health-care industry's style of functioning to a new level. The following are some of the enhanced services: (1) providing a secure format for medical records, (2) figures and facts that are correct, symptoms & signs to look out for, (3) medication, treatment methods, and diagnosis, (4) services for prescriptions and billing, (5) safer and more transparent Service for prescriptions and billing, (6) analyses, tests, and outcomes, and (7) medication-related issues, side effects, and other conditions.

PhilHealth states the following when implementing electronic health records for primary care:

PCB Providers

PCB Providers which might be nevertheless the usage of the Updated Primary Care Module (UPCM) will be given till the give up of the year (December 31, 2016) to interact Electronic Medical Record (EMR) Providers whose systems/software program handed the validation of the Joint DOH and PhilHealth validation team. The EMR System will be used for the motive of enlisting, profiling, and filing PCB-associated statistics to PhilHealth.

List of latest EMR Providers who will skip the validation trying out will be frequently published withinside the PhilHealth portal or internet site. As such, PCB carriers ought to test the stated portal or internet site to affirm the validation certification. PCB carriers shall pick most effective (1) from many of the demonstrated EMR Systems to be used inside their respective facilities.

In compliance with RA 10173 or the Data Privacy Act of 2012, PCB Providers will be required to offer and ask the sufferers to study and signal an Informed Consent Form (Annex A - Approved Informed Consent Form Template), and ensure that the sufferers recognize its contents previous to signing. Signed Informed Consent Forms will be accurately stored and made to be had with the aid of using the PCB Providers for prison or audit purposes.

PCB Providers shall observe the digital reporting necessities of PhilHealth as prescribed below PhilHealth Advisory No. 11-01-2015. PCB Providers shall make certain that there are suitable Memorandum of Agreements (MOAs) and Service Level Agreements (SLAs) made among their Management and EMR Providers. The MOA is a report wherein the PCB Provider and EMR Provider comply with paintings collectively for a not unusual place objective.

It may also outline the running relationships, activities, deliverables, behavior of paintings, and different important necessities among the PCB Provider and EMR Provider. The MOA is primarily based totally on a suggestion that's to be customary with the aid of using a PCB Provider (to whom the suggestion is made) and an EMR Provider who makes the suggestion. When the EMR Provider`s suggestion is customary, the MOA serves as a promise of events to every different, and to the provisions therein to which they've agreed upon. Both events have the proper to visit courtroom docket withinside the occasion of the non-overall performance of any provision of the agreement.

The SLA will be a part of the MOA in which a carrier is officially described consisting of the scope, quality, and obligations of the EMR Provider are explicitly listed. Common characteristics of the SLA is the shrunk transport time of the carrier or overall performance gadget uptime, suggest time among failures, suggest time to restore or recover, defining celebration that is accountable for reporting faults or paying fees, statistics rates, throughput, and different measurable information as will be agreed upon. The MOA and SLA among the PCB Provider and EMR Provider will be prison and binding most effective to the contracting events herein. PhilHealth shall now no longer be held accountable for any movement of the EMR Provider almost about its engagement with the PCB Provider which

could end in harm or harm to the PCB Provider or its clientele. The EMR Provider shall maintain PhilHealth, its employees and instrumentalities, loose from any legal responsibility with regards to its engagement with its customer PCB Provider/s.

Effective January 1, 2017, onwards, all PCB Providers will be the usage of demonstrated EMR Systems. PhilHealth shall no longer re-accredit PCB Providers that can't conform with using demonstrated EMR Systems.

EMR Providers

All business arrangements of EMR providers must be properly coordinated with the relevant PhilHealth Regional Offices (PRO) and/or Local Health Insurance Offices (LHIO). EMR system training, delivery of software operations or user manual and operation manual, technical support, system availability, system security and, among others, must be included in Service Level Agreement between PCB supplier and DME supplier. The scope is to use the validated EMR system to meet the PCB requirements and other future requirements. DME suppliers will be required to assist PCB suppliers in securely transmitting or submitting data or information in the event of failure or lack of connectivity. EMR providers must provide PhilHealth with a copy of the MoU and PhilHealth must submit to the eHealth EMR Expert Group Secretariat.

Notion

According to D’Alessio, Notion gives the building pieces, and users can use them to develop layouts and toolbox. Many people refer to Notion as an "internal wiki" that allows teams and individuals to plan projects, work, and achieve their objectives. Similarly, the patients and their information can be viewed in the same manner.

This workspace allows you to write in a beautiful, clean environment, create your own personal wiki (with infinite levels of content), plan using a kanban view, a calendar, or a simple list view, and, last but not least, capture and record your workflows using spreadsheets and databases. Notion is compatible with Android, iOS, Mac, Windows, and the Web.

Notion allows teams to collaborate in real time by allowing them to share, remark, and assign tasks and reminders. As a result, teams may benefit from Notion in the same way that individuals and professionals can.

In particular, Notion has these important uses to be aware of. Wiki is one of the most essential functions of concept. Notion includes a powerful database and a robust wiki tool. Create a central repository for a range of content, such as company goals, office policies, engineering procedures, and contact information. Users can contribute a variety of content kinds, such as embeds, photos, and lists. They can rearrange the arrangement using a

drag-and-drop interface. The tools provided by Notion also make it simple to update information.

Management of projects and tasks. From a single platform, Notion allows teams to plan, track, and update different projects and tasks. Remote teams have an accurate perspective of all work because of high accessibility, clear visibility, and real-time updates. At any time, team members can make comments and initiate dialogues with anyone. Notion also supports at-mentions, which allows for more direct conversation.

Management of notes and documents. Users can contribute videos, code, bookmarks, and photos, among other things. Drag and drop the material to reorganize it in various ways. Notion software is more than a text editor; it leverages databases to keep track of all material, including notes and documents. Adding unique keywords for monitoring, adding coworkers for collaboration, and establishing due dates for project scheduling are some of the other capabilities. Users can keep their notes private, share them with their colleagues, or make them public on the internet.

Notion as a solution (NaaS)

With the above-mentioned definition of Notion, This leads to the conclusion that this could be a solution to the present issues with traditional or paper-based medical records. This workspace enables you to write in a

beautiful, clean environment, construct your own personal wiki (with limitless levels of content), plan using a kanban view, a calendar, or a simple list view, and capture and record your processes using spreadsheets and databases.

Notion covers costs, storage, security, access, readability, and accuracy. A much simpler method that is simple to implement and learn. As with the paper vs. electronic medical record debate, it is apparent that electronic medical records make authorized persons' lives easier.

Medical records and their management have evolved at the same rate as technology and medical practices. To maintain physical documents in a digital world, more than 85% of physicians now use electronic medical records (EMR) systems. There is more patient data than ever before thanks to breakthroughs in diagnostics and analysis tools.

Notion is compatible with a variety of devices. It has a web app, a desktop app for Mac and Windows, and native mobile apps for iOS and Android. Users now have more alternatives for accessing work from any location, including off-site and on the go. Information sharing is also straightforward.

Individuals and teams may organize work, tasks, and projects using a clutter-free interface with built-in customisation. Although a Notion project management review may not place the program in the same league as other

PM solutions, its features, particularly its wiki capability, allow teams and organizations to use Notion for more broad and less difficult projects.

Notion API

As indicated by Frank, the Notion API is Notion's arrangement of devices and guidelines that permit engineers to compose code that speaks with Notion. Like any API, there is an API reference that engineers can use to assemble their incorporations. This reference contains every one of the orders that engineers can use in their code. Sooner rather than later, custom incorporations can be incorporated into numerous applications like Slack, AirTable, Asana.

Right now, clients can associate a significant number of these applications up to the Notion API utilizing go-between applications like Automate.io, IFTTT, and Zapier.

These applications do exactly the same thing: They associate with APIs for a wide range of applications and give an approach to interface the applications together. As such, regardless of whether there is certifiably not an authority mix for two explicit applications, you can make one with these instruments.

AppScript

Google Apps Script lets you manipulate Google Sheets. Users can use Apps Script to add custom menus, dialogs, and sidebars to Google Sheets. It also lets you write custom functions for Sheets, as well as integrate Sheets with other Google services like Calendar, Drive, and Gmail. Most scripts designed for Google Sheets manipulate arrays to interact with the cells, rows, and columns in a spreadsheet.

Virtual Physical Examination

The ability to listen to a patient's story is a crucial clinical skill. Patients have faith in professionals with great communication skills when they combine caring and clinical expertise. Given the pandemic of coronavirus disease 2019 (COVID-19) and the necessity to keep susceptible patients (and clinicians) at home and away from health care institutions to reduce the risk of virus transmission, virtual, or telehealth, visits have risen rapidly. Many physicians must learn abilities to get objective information from these types of visits as a result of the increased use of telehealth. Although the basic activities of virtual visits include eliciting a comprehensive history and adjudicating prescription lists and allergies, extra data from a telehealth physical examination can be beneficial. A focused physical examination either confirms or gives evidence that can guide specific clinical tests or therapies based on the history. These maneuvers seem to work well with patients in our experience. As a result, in the context of post-pandemic payment regulations for telehealth visits, performing a telehealth physical examination may be considered a critical component.

A group of Doctor of Medicine-Master of Public Health students developed "Telehealth Ten," a patient-assisted clinical evaluation to assist doctors in navigating this new environment. Patients: A Virtual Physical Exam in Ten Steps

STEP 1: VITAL SIGNS

Patients should use a validated digital upper-arm BP cuff and an electronic scale to keep track of their daily weight. Patients should weigh themselves in the morning on the day of the telemedicine visit. Prescribe an exact reading of your basal blood pressure. 4 For 5 minutes, patients should sit quietly without glancing at screens, conversing, or writing. In one minute, they should take their blood pressure and heart rate twice, once standing and once seated. A considerable drop in blood pressure in response to a change in posture is followed by an increase in heart rate, which can be a prelude to autonomic causes of orthostatic hypotension. Temperature and pulse oximeter data can be used to identify people with COVID-19. This can be done by an assistant or nurse prior to the virtual visit.

STEP 2: SKIN

Instruct patients to examine themselves for new bruises, rashes, lacerations, psoriasis plaques (particularly on the elbows and knees), or edema. Inquire about any spots where they've scratched again and over again. Examine the patient's face, neck, arms, elbows, chest, belly, and legs.

Request that the patient demonstrate what they've learned. Make a request to see someone's backside from someone you trust.

STEP 3: HEAD, EYES, EARS, NOSE AND THROAT

Ensure that the patient understands what you're saying! Is it possible that they're hearing aid wearers? Inquire about your vision and sense of smell, and whether they are normal or have changed due to COVID-19-induced anosmia.

Close the patients' eyes and search for xanthelasma. Ask patients to glance up when they open their eyes to determine if they have a large corneal arcus, which is a common symptom of familial hypercholesterolemia in people under 45. By looking up, you can identify if your pupils are symmetrical, constricted, or dilated. Look for evidence of icterus on the sclera. Ptosis must be reported.

STEP 4: NECK

Patients should look over their right shoulder first, then their left shoulder. Do they help with pain alleviation or restriction of motion? Request that the patient swallow and take note of any discomfort that would indicate a goiter. If they experience a bouncing sensation in their neck, inquire about it.

Instruct them to move their heads to the left and observe their neck veins. Volume overload is indicated by dilated neck veins above the

collarbone. If the patient is near a window, natural light may help detect neck veins.

Inhale deeply to observe whether your neck veins collapse. The Kussmaul sign can indicate constrictive pericarditis or other right-heart issues. Examine for large tricuspid “a” wave or a regular feeling of rapid hammering, which could suggest a tachycardia, such as atrioventricular nodal reentry tachycardia.

STEP 5: LUNGS

Inhale deeply and exhale slowly via an open mouth. Coughs and wheezes should be avoided. Instruct them to take a deep breath and hold it for ten seconds.

Tachypnea and the use of auxiliary muscles are symptoms of poor breathing.

STEP 6: THE HEART

Take the wrist pulse of the patient or carer. Assign them the task of keeping track of the beats. Skips or pauses in the pulse can induce atrial fibrillation, atrial flutter with varying block, or an irregular pulse. If the BP cuff has one, inquire if any irregularities in the rhythm were discovered.

STEP 7: ABDOMEN

Look for smoothness, non-tenderness, and typical size in the abdomen. If you have discomfort or distention, especially after coughing, an in-person clinic visit may be necessary. Inquire about any abdominal scars and the circumstances surrounding them.

STEP 8: EXTREMITIES

Check to see whether your toes and fingers are cooler than they usually are. Inquire about cold sensitivity and color changes to rule out Raynaud's. Instruct patients to examine their lower legs and ankles for pitting edema. Instruct patients to wrap their hands around their calves to determine which one is swollen. Patients with high cholesterol should examine their Achilles tendon to see whether it is lumpy or larger than their thumb, since this could indicate an Achilles tendon xanthoma.

Theme:

Swelling in one or both lower legs must be ruled out.

Inquire about the legs at the window on the bottom level.

To check for pitting, patients should dig their thumbs into their skin. If they have a tape measure, they can measure the calves from the ankle.

STEP 9: NEUROLOGICAL

Instruct patients to do so while extending their fingers and raising their hands as if catching rain. Examine the patient for tremors (or tremors when using utensils) or weakness in one arm. If this is the case, see if they have shoulder issues that cause one arm to be lower than the other when they stretch their arms. To measure proximal weakness, patients should stand up with their arms crossed across their chest. Do you have any issues with dizziness? If this is the case, take your blood pressure and pulse while sitting and standing. I keep going back and forth to the door. Inquire if they occasionally use a cane or walker.

Look for pronator drift, which is a sign of unilateral weakness. Patients should rise from a chair with their arms folded to assess proximal muscle weakness. If this finding implies an underlying muscular condition or statin-associated muscle weakness, a serum creatine kinase test may be conducted.

STEP 10: HEALTH DETERMINANTS

Inquire about your food habits, exercise, sleep, stress, and social support. Inquire about their food, medical, and supply issues, as well as their housing and transportation options and feelings of security at home.

Keep an eye on the patients and the people who are caring for them. Examine their emotions and facial expressions.

Telehealth visits are the greatest alternative for ambulatory treatment that balances individual and public health-related safety and clinical effectiveness. Indeed, listening to the patient and compiling a thorough history to guide insights gleaned through a limited, but potentially valuable, patient-assisted physical examination can assist patients and doctors in addressing medical problems in order to stay safe and healthy.

COVID and Self Remote Monitoring

Infectious pandemics such as COVID-19 can overwhelm medical facilities, and there is a need for hospital-at-home models to care for less severely ill patients at home, thus decreasing transmission risk and freeing up hospital beds for more critically ill patients. Electronic phenotyping algorithms, including “real-time” natural language processing, can detect complications in patients with COVID-19, facilitate timely triage to intensive care units, and determine clinical trial eligibility. Similarly, even simple tools like a COVID-19 self-monitoring alert, providing doctors with the temperature and oxygen saturation of patients, is effective for early intervention. Such alerts can be linked to clinical decision support tools to provide guidance at the point-of-care and can identify individuals at high risk who may benefit from home oximetry, hospitalization, or early escalation of level of care in the hospital to the intensive care unit as well as identify

individuals for clinical trials and drug repurposing. A critical care physician could monitor patients in small rural hospitals remotely, guiding local nurses, respiratory therapists, and hospitalists to adjust medications or ventilators and to perform interventions as needed. While a structured tool certainly would have helped during 2020, now is a good time to add a simple and practical checklist that represents a key pivot to our management of COVID-19.

As we continue to evolve our risk messaging to incorporate our best understanding of this disease and treatment, a simple checklist may help hundreds of thousands of people receive earlier intervention, improve outcomes, and improve the resilience of our public health infrastructure. Such a checklist should provide simple and direct criteria to COVID-positive individuals regarding when to stay home and nurse their infection versus when signs and symptoms indicate disease progression and warrant specific early interventions prior to the need for emergency medical treatment for life-threatening disease.

Earlier this year, a group of doctors and IT professionals teamed up to develop CoSMoS.

The system architecture of CoSMoS involved five components: Telegram instant messaging, a clinician dashboard, system administration

(ie, back end), a database, and development and operations infrastructure. The integration of CoSMoS into clinical practice involved the consideration of COVID-19 infectivity and patient safety. This study demonstrated that developing a COVID-19 symptom monitoring system within a short time during a pandemic is feasible.

Security

Electronic Medical Records (EMRs) can provide many benefits to physicians, patients and healthcare services if they are adopted by healthcare organizations. But concerns about privacy and security that relate to patient information can cause there to be relatively low EMR adoption by a number of health institutions. Safeguarding a huge quantity of health data that is sensitive at separate locations in different forms is one of the big challenges of EMR.

Data Encryption

Data encryption is a security method where information is encoded and can only be accessed or decrypted by a user with the correct encryption key. Encrypted data, also known as ciphertext, appears scrambled or unreadable to a person or entity accessing without permission.

Data Encryption is used to deter malicious or negligent parties from accessing sensitive data. An important line of defense in a cybersecurity architecture, encryption makes using intercepted data as difficult as possible. It can be applied to all kinds of data protection needs ranging from classified government intel to personal credit card transactions. Data encryption software, also known as an encryption algorithm or cipher, is used to develop an encryption scheme which theoretically can only be broken with large amounts of computing power.

Transport Layer Security (TLS)

Transport Layer Security or TLS is a cryptographic protocol that provides end-to-end security of data sent between applications over the Internet. It is mostly familiar to users through its use in secure web browsing, and in particular the padlock icon that appears in web browsers when a secure session is established. However, it can and indeed should also be used for other applications such as e-mail, file transfers, video/audio conferencing, instant messaging and voice-over-IP, as well as Internet services such as DNS and NTP.

Without TLS, sensitive information such as logins, credit card details and personal details can easily be gleaned by others, but also browsing habits, e-mail correspondence, online chats and conferencing calls can be

monitored. By enabling client and server applications to support TLS, it ensures that data transmitted between them is encrypted with secure algorithms and not viewable by third parties.

SOC Type 2 security

The System and Organization Controls (SOC) 2 Report will be performed in accordance with AT-C 205 and based upon the Trust Services Criteria, with the ability to test and report on the design (Type I) and operating (Type II) effectiveness of a service organization’s controls. The SOC 2 report focuses on a business’s non-financial reporting controls as they relate to security, availability, processing integrity, confidentiality, and privacy of a system.

The SOC 2 audit process includes 5 categories of Trust Services Criteria: Security, Availability, Confidentiality, Processing Integrity, and Privacy. These categories each cover a set of internal controls related to different aspects of your information security program. Each of the criteria have corresponding points of focus, which should be met to demonstrate adherence to the overall criteria and produce an unqualified opinion (no significant exceptions found during your audit). One benefit to the trust services criteria is that the requirements are predefined, making it easier for business owners to know what compliance needs are required of them and for users of the report to read and assess the adequacy.

Many entities like Notion and its users outsource tasks or entire functions to service organizations that operate, collect, process, transmit, store, organize, maintain and dispose of information for user entities. SOC 2 was put in place to address demands in the marketplace for assurance over non-financial controls.

HIPAA

The U.S. Department of Health and Human Services ("HHS") issued the Privacy Rule to implement the requirement of the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"). The Privacy Rule

standards address the use and disclosure of individuals' health information—called "protected health information" by organizations subject to the Privacy Rule — called "covered entities," as well as standards for individuals' privacy rights to understand and control how their health information is used. Within HHS, the Office for Civil Rights ("OCR") has responsibility for implementing and enforcing the Privacy Rule with respect to voluntary compliance activities and civil money penalties.

A major goal of the Privacy Rule is to assure that individuals' health information is properly protected while allowing the flow of health information needed to provide and promote high quality health care and to protect the public's health and wellbeing. The rule strikes a balance that permits important uses of information, while protecting the privacy of people who seek care and healing. Given that the healthcare marketplace is diverse, the Rule is designed to be flexible and comprehensive to cover the variety of uses and disclosures that need to be addressed.

Philippine Health Information Exchange (PHIE)

With the advent of information and communication technologies, health data and information can now be shared by one healthcare provider with another through electronic transmission. Further, the use of internationally recognized standards, and transmission and validation

protocols that ensure client privacy and data protection have made the exchange feasible in a secure manner.

At present, a client receives healthcare services in various health facilities such as rural health units (RHUs), government and/or private hospitals, and private clinics. The data remains in the health facilities where services were rendered. Healthcare providers usually get the clients anecdotal information to obtain pertinent information from previous health encounters following the traditional practice of using paper forms, rather than having to access the client's health encounter record from previous health facilities. Often, this scenario leads to redundancy and additional setback for the client such as repeating diagnostic procedures that may have been already facilitated in the previous health encounters, duplication of treatments, inappropriate medication prescription due to lack of information on allergy triggers, and/or incorrect diagnosis due to insubstantial health history, among others. These problems can be prevented or eliminated if healthcare providers have access to quality and complete information anytime and anywhere.

Guided by the PeHSP for UHC, one of the identified critical eHealth projects to address the above situational health condition is the development and implementation of the Philippine Health Information Exchange (PHIE). The PHIE is a platform for secure electronic access and efficient exchange of

health data and/or information among health facilities, health care providers, health information organizations, and government agencies in accordance with set national standards in the interest of public health. The PHIE is envisioned to become an integral component of the health care delivery system as part of health services available to all patients. It shall integrate and harmonize health data coming from different electronic medical record systems and hospital information systems. It shall provide an infrastructure for data/information sharing between health care providers, and support access to patients records across providers in all geographic areas of the country; thereby, improving efficiency and reliability of communication among participating health care providers. In general, its implementation shall promote public health, improve total patient care, and better decision making, while safeguarding the right to privacy of every individual.

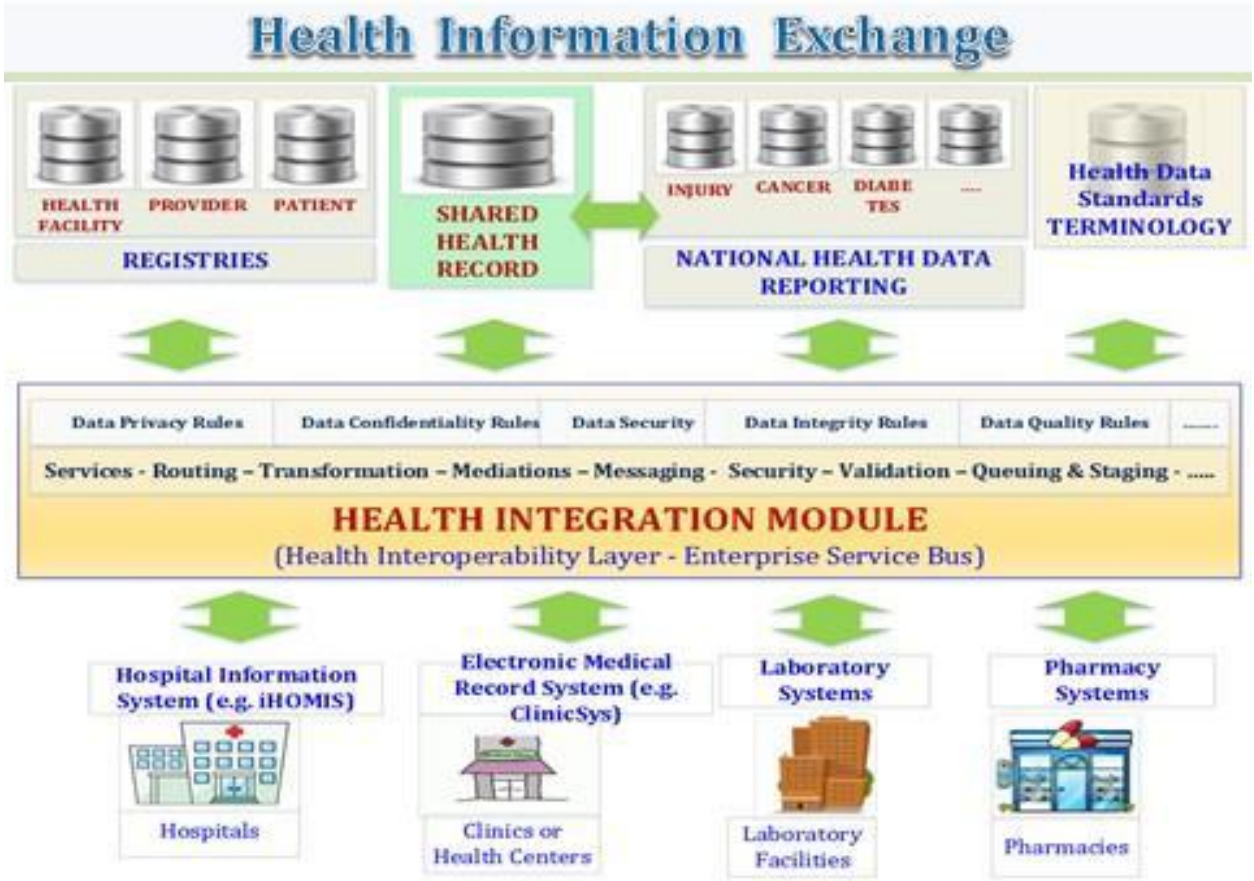


Figure 1. Philippine Health Information Exchange

The PHIE responds to the call of the national government to create a citizen-centric government, where on 17 March 2015, the Secretary of Health, Secretary of Science and Technology (DOST), President and Chief Executive Officer of PhilHealth, and Executive Director of the DOST-ICT Office (now Department of Information and Communications Technology) entered into a Memorandum of Agreement on its management and implementation, including other related eHealth projects. From the health

sector standpoint, the implementation of PHIE supports the attainment of UHC to foster good governance, strengthen accountability, increase transparency, and advance operational efficiency of various stakeholders in the health sector and to deliver quality services and make information available to various service providers and the people.

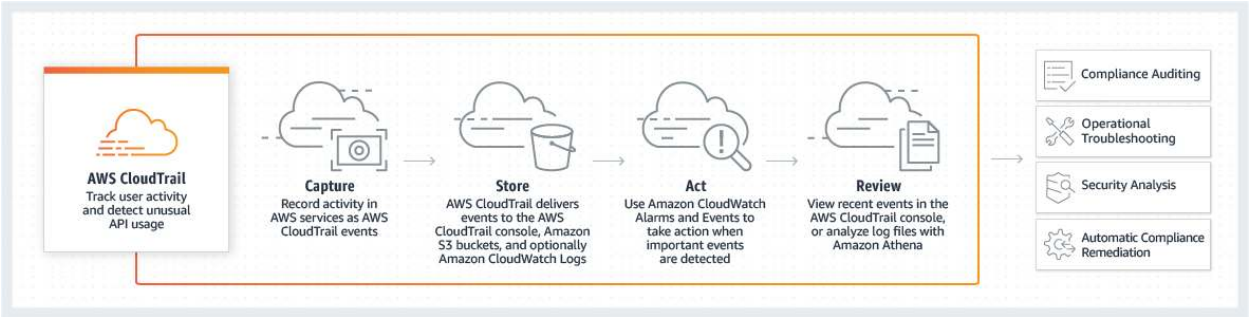
Quarterly Compliance Audits

A compliance audit evaluates whether an organization is following specific rules or standards. These may be imposed by government regulatory bodies pertaining to taxation, IT security issues, health and safety standards, or environmental protection.

Compliance auditing is mainly used to evaluate whether the company is following external regulations, but it can also be used at a corporate level. A compliance audit might be performed to determine whether a subsidiary company follows the wider corporation’s procedures and policies. It provides a holistic view of your data footprint, assess risk and impact with regard to non-compliance, and help build roadmaps that align to the most applicable regulatory frameworks.

Amazon Web Services (AWS) - Cloud Trail

AWS CloudTrail is a service that enables governance, compliance, operational auditing, and risk auditing of your AWS account. With CloudTrail, you can log, continuously monitor, and retain account activity related to actions across your AWS infrastructure. CloudTrail provides event history of your AWS account activity, including actions taken through the AWS Management Console, AWS SDKs, command line tools, and other AWS services. This event history simplifies security analysis, resource change tracking, and troubleshooting. In addition, you can use CloudTrail to detect unusual activity in your AWS accounts. These capabilities help simplify operational analysis and troubleshooting.



The AWS CloudTrail security process

Protected Health Information (PHI)

The Privacy Rule from the US Department of Health and Human Services defines PHI is individually identifiable health information, held or maintained by a covered entity or its business associates acting for the

covered entity, that is transmitted or maintained in any form or medium (including the individually identifiable health information of non-U.S. citizens). This includes identifiable demographic and other information relating to the past, present, or future physical or mental health or condition of an individual, or the provision or payment of health care to an individual that is created or received by a health care provider, health plan, employer, or health care clearinghouse.

In HIPAA, PHI is defined as individually identifiable health information that is transmitted or maintained in any form or medium (electronic, oral, or paper) by a covered entity or its business associates, excluding certain educational and employment records.

Philippines' Data Privacy Law

Republic Act No. 10173, otherwise known as the Data Privacy Act is a law that seeks to protect all forms of information, be it private, personal, or sensitive. It is meant to cover both natural and juridical persons involved in the processing of personal information.

Philippine Health Information Exchange (PHIE)

The PHIE is an electronic health (eHealth) initiative of the Department of Health (DOH), the Department of Science and Technology (DOST) and the Philippine Health Insurance Corporation (PhilHealth) that would ensure accurate and timely health information exchange that can be instrumental in improving the services of these three agencies as well as the other organizations that could use the said data.

Privacy Commissioner Raymund Enriquez Liboro states that the efficient use of electronic medical records (EMR) for eHealth has a lot of potential benefits for our citizens. It is a good example of innovation in the free flow of information that the DPA espouses. He also added that the protection of personal information has to be prioritized in such systems as there is greater danger of data breaches with the increased number of users and processors.

Health information is considered sensitive personal information that requires a higher level of data protection, and private hospitals agree with this. According to Dr. Rustico Jimenez of Medical Center Parañaque and PHAPI President, hospitals have always valued information privacy, this one of the reasons why our industry will soon be having the Health Privacy Code which is also in-line with the Data Privacy Act of 2012. Hospitals are cleaning up their patient records to be ready for the full implementation of the

Philippine Health Information Exchange (PHIE) which is currently under development.

Sharing Patient Health Information and Authorization

The HIPAA Privacy Rule permits a doctor, laboratory, or other health care provider to share patient health information for treatment purposes by fax, e-mail, or over the phone.

The Privacy Rule requires that covered health care providers apply reasonable safeguards when making these communications to protect the information from inappropriate use or disclosure. These safeguards may vary depending on the mode of communication used. For example, when faxing protected health information to a telephone number that is not regularly used, a reasonable safeguard may involve a provider first confirming the fax number with the intended recipient. Similarly, a covered entity may pre-program frequently used numbers directly into the fax machine to avoid misdirecting the information. When discussing patient health information orally with another provider in proximity of others, a doctor may be able to reasonably safeguard the information by lowering his or her voice.

Chapter III Methodology

Segue MediRecords was an applied research study aiming to produce a simpler EMR then validate the effectiveness of said EMR system by obtaining primary data from doctors and/or law & security experts in the Philippines qualitatively and quantitatively through interviews, e-mail inquiries, and surveys. This study is cross-sectional and respondents were selected in a purposive manner.

EMRs have been in existence for a long time. As a result, many doctors have current systems set up and learning from the current systems to better it is viable. However, since a population of doctors who are still using the pen-and-paper method still exist, the researchers would like to validate the applicability of their product in practice.

Methods/Design

The variables in this study were measured and the frequencies, averages, and correlations were stated. The quantitative data produced in a research endeavor can be evaluated descriptively or inferentially using statistical methods. As a result, the researchers will use a quantitative research approach to address the issues.

Descriptive analysis refers to statistically describing, aggregating, and presenting the construct of interests or associations between these conducts, whereas a correlation occurs when a change in one variable is followed by a change in another variable. In a nutshell, it is a tool for determining the relationship between two variables.

Environment

The location of this study was based on the Science and Technology Education Center Senior High School located in Lapu-Lapu City, a city in Cebu. The respondents in this study are public and private doctors working within the Province of Cebu.

Sampling Procedure and Sample

The study's direct participants were the doctors in Cebu Province who are being interviewed or surveyed. They were gathered using a purposive

sampling technique. The researchers used a questionnaire and mailed it to a sample of 10 doctors. These doctors are physicians who have no access to EMR or do not use EMR with their medical records of patients.

Instrument

Effectively gathering relevant data requires validated questionnaires. The researchers adapted a matured tool for measuring usability. The simple 10-question tool will be created on Google forms. This is also where the respondents will be answering. This questionnaire will then be disseminated for the respondents with the help of Facebook Messenger.

The System Usability Scale (SUS) was originally created by John Brooke in 1986, it allows researchers to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications. It consists of a 10 item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree.

According to Usability.gov and Brooke himself in a retrospective paper, SUS has become an industry standard, with references in over 1300 articles and publications. The noted benefits of using SUS include that it is a very easy scale to administer to participants. It can be used on small sample sizes with reliable results. Most importantly, SUS is valid, it can effectively differentiate between usable and unusable systems.

Another variation on using words to describe the SUS is to think in terms of what's "acceptable" or "not acceptable." Bangor et al. (2008) assigned these terms for when the SUS was well above average or well below average. Acceptable corresponds to roughly above 70 (above our average of 68) and unacceptable to below 50 (closely corresponding to our designation of scores lower than 51.6 with a grade of F). They designated the range between 50-70 as "marginally acceptable," which encompasses a range from C to D in our curved grading scale.

Grade	**SUS**	**Percentile range**	**Adjective**	**Acceptable**
A+	84.1-100	96-100	Best Imaginable	Acceptable
A	80.8-84.0	90-95	Excellent	Acceptable
A-	78.9-80.7	85-89		Acceptable
B+	77.2-78.8	80-84		Acceptable
B	74.1 – 77.1	70 – 79		Acceptable
B-	72.6 – 74.0	65 – 69		Acceptable
C+	71.1 – 72.5	60 – 64	Good	Acceptable

C	65.0 – 71.0	41 – 59		Marginal
C-	62.7 – 64.9	35 – 40		Marginal
D	51.7 – 62.6	15 – 34	OK	Marginal

Table 3.1: The “grading system” to describe raw SUS scores.

Data Gathering Procedure

The data collection for this study will be conducted through the use of Google Forms. It is used to construct questionnaires and prevent the researchers from contracting communicable health diseases while abiding by the COVID-19 protocols. Respondents will be contacted online through Facebook Messenger. The researchers will distribute the necessary instructions and questionnaires using the methods indicated above. Additionally, they will explicitly explain the purpose of the study through a formal letter. Although respondents will only have 10 minutes to complete the questionnaire, they will be urged to complete it during their leisure time.

Finally, after acquiring responses from the respondents, the answers from the Google Forms will be imported into Google Sheets for the cleaning of data. The collected data will then be subjected to the proper statistical analysis. Following that, the researchers will evaluate and analyze the data. The researchers will then submit the draft, which will be corrected and finalized.

Statistical Treatment of Data

Doctors today have less time on their hands due to the ongoing medical crisis. As a result, the researchers conducted an asynchronous survey with the **System Usability Scale (SUS).** Doctors will evaluate ten

(10) SUS questions customized for Segue MediRecords on a scale of one to five based on their level of agreement. To analyze the data, researchers will be using a spreadsheet software to subtract one from the score for each odd-numbered question, subtract the value of each even-numbered question from five, then add the new values together to get the total score. They will then multiply by a factor of two and five (2.5) to get their score out of 100. It is worth mentioning that the output of SUS is not a percentage, but a straightforward representation of your score. Identical to a grade earned on a classroom quiz.

The System Usability Scale is not diagnostic and will not identify specific faults; nevertheless, it will provide researchers with a red or green light indicating how badly a product's usability requires improving. The average score on the System Usability Scale is 68. If the score is less than 68, there are likely major usability issues with Segue, which should be addressed immediately.

A summary of how the scores are calculated: A grade of 80.3 or higher is considered an A. The product is usable, and it's reasonable to infer that users desire it. A score of 68 or higher results in a C, indicating that the product is performing well, although there is space for development. Finally, receiving a 51 or lower results in an F, emphasizing the importance of usability and implementing a correction fast.

Following the specific instructions in the scoring of SUS, the researchers will then be using **qualitative analysis** to further analyze the responses on both the overall and individual scores of the Systems Usability Scale.

Ethical Considerations

Since perception will be measured on a certain phenomenon, the level of ethical responsibility is moderate. Confidentiality and anonymity of the personal information of the respondents will always be observed. This study upholds RA 10173, or the Data Privacy Act, which protects individuals from unauthorized processing of personal information that is (1) private, not publicly available; and (2) identifiable, where the identity of the individual is apparent either through direct attribution or when put together with other available information.

The respondents will be asked if they are willing to participate or not participate in the study. Each respondent will be properly instructed and informed consent indicating that their participation in this study is voluntary and without any financial remuneration. All the data gathered will be kept in an undisclosed area of one of the researchers' vaults and locked. Disposal of the data will abide with the existing Data Privacy Act.

The following principles will be strictly observed in the conduct of the study.

Protection of Human Rights. Three ethical standards will be followed for the protection of the respondents ' interests. These are the ideals of respect for people, of beneficence and of justice. The first principle is that of

respect for persons. In accordance with this concept, the respondents will undertake the exercise of autonomy. This will be applied to the respondents' right to decide what activities they will take or will not take part in the study. Respondents will be made to understand what they are being asked to do in the study, that is simply to answer a survey questionnaire and make a choice to participate freely or willingly free of coercion, restriction or undue influence. As evidence of this willingness, a consent form will be used to signify the willingness of the respondents to participate.

The principle to be adhered also is beneficence. This related to the researcher's duty to ascertain maximizing the study's benefits and minimizing the risks. The principle also requires that the researcher will not cause any harm to the respondents and this will be achieved in the research by not implementing any treatments, procedures or alternatives. The last principle is justice which explains that the respondents will be selected equitably. To do this, criteria for inclusion and exclusion will be used when recruiting the participants. Further, the study will not include any vulnerable subjects. Respondents will be subjected to the same data collection process in which to answer a questionnaire. The study will make the respondents one of the communities which will benefit from the research.

Transparency. This principle will be observed as the researcher intended to present the findings of the study to the Science and Technology Education Center - Senior High School, Lapu-Lapu City, Cebu. The researcher also intends to provide a copy of the study to the school. The researcher also intends to present the study in either local, national or international research congress through either oral or poster presentation if needed.

Risk-Benefit Ratio Determination. The following significant potential benefits for the respondents will be guaranteed in order to limit the hazards and maximize the benefits in the study.

Benefits. The following benefits will be derived from doing this study: awareness of alternative EMRs that provide physicians with more control over will be raised and can potentially impact their practice.

Risks. The following risks will be avoided if not minimized: (a) physical harm – the researcher will only use the survey questionnaire to prevent this; (b) physical inconvenience, fatigue or weariness – respondents will only asked 20-30 minutes of their free time to complete the questionnaire; (c) mental or psychological discomfort – the questionnaire will not ask sensitive

questions; (d) social damage – respondents will not be subjected to stigma, as anonymity will be strictly observed and there will be no questions regarding the sensitivity of the issue, (e) loss of privacy – confidentiality and security of privacy will be strictly observed at all stages, (f) loss of time – a questionnaire will be answered during their free time; and (g) monetary expenses – respondents will not incur any expenses from joining the study as no fees will be collected. Data gathering will be done in the residence of the respondents.

Informed Consent. Implied consent will be relied on in the study. However, as a requirement, an informed consent form will be given to the respondents for signing to signify their voluntary participation. The informed consent form contains the following elements: Status of the respondents. The respondents will be informed that this study is of an educational nature and that this is done as a means of meeting the academic requirements of the competencies in Practical Research III.

Study Goals. This study aims to organize, simplify, and decentralize Electronic Medical Records so that physicians may gather patient information faster.

Type of Data. The research will collect subjective, personal, and nominal data from the responses of the respondents to a questionnaire.

Nature of the Commitment. The researcher will give the respondents 15- 20 minutes of their time to respond to the survey questionnaire.

Sponsorship. This study has no sponsors. The study is part of an academic requirement of the researcher. Thus, all expenses will be taken care of by the researchers alone.

Selection. Respondents will be selected based on the criteria for inclusion and exclusion. The recruitment method which will be used is online messaging.

Potential Risks. The risk to which respondents will be exposed is similar to the risk they encounter in their everyday lives. The study will only be replying to a survey questionnaire. Furthermore, the questionnaire will not contain any sensitive questions which may harm the respondents psychologically or emotionally. Discussions on the potential risk and how it will be reduced are addressed in the preceding paragraphs on risk-benefit assessment.

Potential Benefits. Detailed discussion on the benefits that may be obtained in the study are discussed in the preceding paragraphs.

Alternatives. The principal procedure for collecting data will be through a survey questionnaire. The respondents will not be given any interventions or treatments and therefore alternatives did not apply.

Compensation. Words of gratitude will be the only way of thanking the respondents. The respondents will not be given any compensation or incentives considering that the review involved just answering a questionnaire. This is also adapted so as not to influence participation as it may be misinterpreted as inducements. Expression of gratitude will be the manner in which respondents will be praised for their participation in the research.

Pledge of Confidentiality. Provisions of the Data Privacy Act will be strictly observed in the conduct of the study. Also, specific confidentiality measures will be instituted to preserve the anonymity of the respondents. A specific section on privacy and confidentiality is provided for the discussion below.

Voluntary Consent. The researcher ensured voluntary consent will be sought so that the respondents can become a valid respondent in the study.

Right to Withdraw and withhold information. There will be no penalties or punishments if respondents decide to withdraw from the study or decline any information because these are their rights.

Contact Information. The researcher provided his e-mail address to the respondents, so that they can be answered without hesitation if there are doubts or complaints about the conduct of the research.

Authorization to access private information. No private information will be accessed by the researcher.

Privacy and Confidentiality Procedures. The respondents will be given privacy by letting them answer in a place where they have full concentration and will not be disturbed when answering the questionnaire. The researcher will not collect personal and private data such as names and addresses of the respondents to maintain confidentiality. The study will be strictly adhering to anonymity. Every questionnaire answered will be labelled using numbers only. The completed questionnaires will be stored in a locked

cabinet that is open only to the researcher. While the collated data will be stored in the computer, the computer and the files will be protected by password. Collated data will be presented in tables.

Compensation and Incentives. The researcher will convey personal gratitude to the respondents for engaging in the research. This will also indicate that the respondents did not receive compensation or incentives as the research is voluntary in nature.

Debriefing, Communication and Referrals. The way to connect with the respondents will be politeness and friendliness. The researcher will be readily available or leave a contact number should questions regarding the study occur. For questions raised, the respondents will directly contact the researcher if they need clarifications on some items in the questionnaires.

Conflict of interest. The researcher declares no conflict of interest. To avoid possibly tainting the data to be gathered, the research is excluded from the survey and will be distributing the questionnaires personally.

Collaborative Terms of Reference. This activity is not in partnership with any person or institution, it is merely a prerequisite of education. The researcher holds intellectual property rights

Vulnerability assessment. As a guideline there will be no vulnerable individuals serving as a research respondent. The researcher took necessary measures to ensure that none of the respondents belong to vulnerable groups.

Chapter IV

Presentation, Interpretation, and Analysis of Data

This chapter presents the answers to the problem of the study. The presentation is done through tables together with the interpretation and analysis with the supporting related literature and studies.

Features included in Segue MediRecords

Cloud Patient Info

Segue allows a patient's identity, demographic profile, health status, medical history, medical records, test results, treatment, or stay in a health facility to be accessed in a secure and timely manner. Segue is a cloud-based website, therefore accessing patient information is much faster than traditional paper patient information.

Segue uses data encryption and may only be accessed by authorized individuals, ensuring the safety of patient information. Enter the cloud, which provides a secure and quick means to store and exchange such photographs. Making current medical records instantly accessible not only enhances the speed and efficiency of patient treatment, but it also saves time and money.

The Doctors will appreciate the convenience. Between 2012 and 2015, 68 percent and 84 percent of doctors said they used their smartphones for professional purposes. They can now quickly access patient information to study even when they are at their separate residences. It provides convenience for the patients. They can keep track of their vital data as well as any other information the doctor has on file for them.

The patient information is organized in a listed fashion, and you can reorganize and add additional details about the patient. See appendix (di pa ma specify kay wala pa na hapsay appendix) for the reference of the structure.)

Basic Information

There is a photo of the patient and a list of basic information about the patient available in the Basic Information section. Name, weight, height, address, birthday, and other basic information is included. The name of the patient is also available in this section. The fundamental patient data is one of the most important pieces of information required in a medical establishment. Patients' basic information is supplied to assist Doctors who are unfamiliar with the patient in providing proper care. Without the patient's basic information, it would appear that providing the necessary care a patient requires would be nearly impossible. Doctors utilize the

patient's basic facts as a starting point and guidance when determining what treatment or care is best for them. It would be in a listing type in the Segue MediRecords, and you would be able to add, remove, and update information. See appendix (di pa ma specify kay wala pa na hapsay appendix) for the reference of the structure.)

Emergency Info

In comparison to the basic information portion, the emergency information section has a larger text size and is mostly made up of emergency hotlines. There is contact information for the patient's relatives as well as the clinic and hospital in case of an emergency. At work, emergencies can strike at any time, so having up-to-date emergency contact information on hand is essential. Medical practitioners should be able to speak with your emergency contact about your medical history, allergies, chronic diseases, and current medications. They may even make medical decisions for their loved ones in some situations. In an emergency, this can be life-saving, so find someone who is willing to do the job, can answer those questions, and has the legal authority to act on your behalf. Information supplied in emergency contact will be kept private and only shared with those who have a valid business need to know, such as in the event of a health or safety emergency. If you require immediate medical

attention, your emergency contacts will be alerted as soon as possible. When you click "emergency info" under the vital links, you'll see the structure of the emergency information. It will take you to a new page with a list of emergency information organized in a listing form that you can edit, delete, and update. See appendix (di pa ma specify kay wala pa na hapsay appendix) for the reference of the structure.)

Additional Medical Info

Essentially, it has the same appearance as the basic information part. However, the information offered in this part is specific to this area. This section is likely to contain information regarding the patient's test findings that were performed for him or her. The following parameters are present: blood oxygen saturation, uric acid, fasting blood sugar, and so on. Incorporating the information offered here would assist clinicians in making a more thorough assessment of the patient's health care needs. Using this information, doctors can develop a more reliable, systematic, and clear diagnosis for the patient. The Additional Medical Information part would be organized in a manner like that of the Basic Information section. Segue MediRecords would store the information in a listing type, and you would be able to add, remove, and update information in the listing type as needed.

Doctor Resources

Segue MediRecords permits doctors to share information with their patients and can be easily accessed by only a click, however authorization information is required prior to the procedure to guarantee both the doctors' and patients' security. The patient will be granted an authorization for the release of health information that has been prepared by the doctor, and this authorization file is properly documented in its completion to ensure the two parties' confidentiality. Not only does Segue make it more simple for doctors, but it also significantly decreases the quantity of paper used. To guarantee that doctors share their information with their patients, follow these steps: (1) Log in to your Notion account and open it. (2) Navigate to the patient's page and click the share button in the top right corner, followed by invite. (3) Enter the email address of the requesting doctor, which must relate to a Notion account, and click invite. (4) Doctors may now modify the content of the patient page. After you've used them, just click remove to unsubscribe.

Segue MediRecords gives important details that must be gathered during consultations or while filling out vital patient records. After extensive research and study, Segue has finally assembled the necessary requirements for a virtual physical examination.

Medical Records

Segue MediRecords has different features in which it has a specific role and structure. Lab result is one of the features where it is a critical requirement in diagnosis, monitoring, and screening of patients. The laboratory result is used to identify between "health" and "illness," and it has a function and responsibility in supplying clinicians with sufficient information to help them interpret the results correctly. The structure of the feature in Notion is synthesized in chronological order with various specific columns to fill in and organize automatically. The name of test, date, test result, conducted by, hospital, and diagnosis summary is seen in the lab results feature of Segue MediRecords. The doctors can simply access this feature by clicking the Lab Results pocket and filling in the details of the patient in opening the boxes.

Immunization record refers to data indicating an individual's immunization status, which may include, but is not limited to, the immunization received by the individual. This feature is a critical tool for increasing and maintaining high vaccination coverage. It signifies any record, regardless of source, that contains information about the status of specific individuals. By clicking the tab Immunizations under the Medical Records feature, the structure in its Notion can be seen where the recent vaccines and immunization record are labeled. In recent vaccines, there are three

columns which are the name of the vaccines, date, and the reaction where the doctor can fill in the data of the patient by clicking the table and type the information. While for the immunization record, it has the same columns with the recent vaccines but there are two columns added which are the no. and type of that particular vaccine. The doctors can simply add more rows by clicking the plus (+) sign in the last row of the table to input more data.

A consultation note is created by a provider in response to another provider's request for an opinion or guidance. Consultations may include face-to-face time with the patient, telemedicine visits, or a second opinion on a diagnosis without patient engagement. When the consultation is complete, a consultation note is normally provided to the referring provider. This feature has a simple structure in Notion which shows the history of a patient. The composition of history has two columns that show the chief complaints and date data. The structure of chief complaints has more information like observations, diagnosis, transcript of consultation, and idea validation. Doctors can access this feature under medical records and input all information about the patient data.

Procedures are a series of steps taken to accomplish a goal in the provision of healthcare. A medical process used to ascertain, quantify, or diagnose a patient's state or parameter. The structure of Notion about this feature has the name of the procedure, date, person who conducted, and

name of the hospital. While for the last feature under medical record which is Others has manageable structure. The doctors are going to encode the specific task done and date with this feature. These features under medical records are understandable and uncomplicated to use.

Miscellaneous

Segue MediRecords is a patient-centered, real-time record that makes information accessible to authorized users promptly and securely. EMRs are a critical component of health IT because they store a patient's medical history, diagnoses, medications, treatment plans, immunization dates, allergies, radiology images, and laboratory and test results. They also provide access to evidence-based tools that providers can use to make care decisions and automate and streamline provider workflow.

One of the most important characteristics of Segue is that authorized physicians may produce and manage health information in a digital format that can be shared with other doctors across several health care organizations. This is designed to exchange data with other health-care providers and organizations, such as labs, specialists, medical imaging centers, pharmacies, emergency rooms, and school and workplace clinics, so they include data from all doctors engaged in a patient's care.

Segue’s application in real life is to lessen the burden of medical practitioners on looking for their patient’s medical data. We then provide centralized or decentralized cloud patient information that can be accessed only by authorized personnel and according to Roukema, such systems enhance readability, availability, and data quality.

In the context of the on-going pandemic, we have the Covid-19 Self-Monitoring Form that the patients can utilize. They can access this form and fill up the different medical information needed in connection to the virus like their symptoms, body temperature and the like. This information can be seen by their physician and will be assessed to give them the medical attention they need.

The COVID-19 patient self-monitoring feature is integrated with an Email Alert. Once the patient’s charts reach dangerous levels, a notification will be sent to the patient’s device about this and an email will also be sent to the doctor’s address with regards the situation together with the patient’s vitals.

Segue can be used by doctors in providing patients and co-doctors recorded consultations with transcripts and timestamps. This is done by removing file limit uploads. A free external recording and transcription service has been developed by the Segue team. The medical professionals

may now be able to upload limitless files without worrying about file size after they have purchased the premium version of Segue.

Segue is flexible and can provide custom fields for specialists. The specialists using it can add different pointers or take away features that are unnecessary in their field.

This custom field section in Segue MediRecords is intended to record specialization-specific patient information. Doctors and specialists will be able to choose from a drop-down list of specialties and Segue will build corresponding input fields for them automatically, saving time.

Premium Features

Segue MediRecords will be having a premium version priced at 14.99$ per month. This is a required step for Segue to include extra features and compensate for the additional server and hosting fees that come with it.

COVID-19 Email Alert

The COVID-19 Email Alert feature integrates with the COVID-19 patient self-monitoring feature. It includes individual patient charts in Segue that tracks the trends of two important vital signs: temperature and blood-oxygen saturation. Once one of the others reaches dangerous levels,

the line in the chart turns red, a push notification will be forwarded to your device, and an email will be sent to the doctor's email address.

This was a feature requested by doctors that resonated with the researchers themselves since the lead researcher and product developer was once a victim of a minor COVID-19 case. This will help doctors tending to a COVID-19 patient systematically track vital signs and intervene as soon as possible.

30-Day Version History

The free version of Segue does not include data backups due to additional server fees, thus, this feature can only exist once the doctors shell out cash. With this, doctors can store backup patient information or go back in time and correct information when necessary. To use it, doctors can click on the "Page History" button located on the ellipsism. They can then select a specific date and time to review.

Data security is important since hospitals cannot be careless about data backup. Their data is crucial for providing dependable care for patients. Imagine a healthcare facility suddenly shutting down due to loss of power. This can translate to damaged and/or missing information. Additionally, besides being an inconvenience for doctors and nurses, this dilemma places patients in danger. To add, legal issues may arise due to the lack of security.

Remove file upload limit

Optimizing the utilization of servers is a key component in a service such as Segue where information is the heart of the product. That is why the current, free version of it obliges doctors to upload files capped at eight megabytes only. This can be limiting especially when uploading large-filed lab results. To mitigate this in the case of patient consultation recordings, the team at Segue has introduced a free external recording and transcribing service.

Once doctors have availed for the premium version of Segue, our medical professionals may now be able to unlimited files without worrying about the size.

Specialist-specific fields

The custom fields section in Segue MediRecords is intended to record specialization-specific patient information. For pediatricians, or doctors who handle babies, this section will include additional fields like head circumference and chest circumference. Once availed, doctors will be able to select from a drop down of specializations, then Segue will automatically create relevant input fields, saving time.

This feature was made relevant after discovering the results of Kokkonen et. al. (2013) where it was observed that cardiologists, orthopedic

surgeons, urologists, and family/general practitioners all used EMRs more frequently than psychiatrists, ophthalmologists, or dermatologists. Employed physicians were more likely to use EMRs than physicians who owned their practices (48 percent vs. 31%, p0.001). Solo practitioners (23%) adopted EMRs at a lower rate than non-solo practitioners (42%, p0.001). Health Maintenance Organization-owned practices used EMRs at a higher rate (83 percent) than physician-owned practices, community health centers, or academic centers (all 45 percent, p0.001). The demographic characteristics of patients had no effect on EMR use ($p>0.05$).

Priority Support

Segue MediRecords is a tool. Like a computer, users will have to familiarize themselves with the interface and know which button to click to arrive at a certain piece of information. This is why aside from the training videos we provide to medical professionals, Segue MediRecords will be creating a dedicated email support for doctors. Whenever something is out of place or when a complex error is causing a problem, doctors can email Segue staff at any time. Those who have availed the premium version will simply be prioritized.

Liability

Patient information is sensitive information. The researchers took to legal counseling to ensure that Segue MediRecords adheres to the strict and complicated healthcare safety standards. This endeavor was successfully done as they were able to interview a Senior Privacy and Compliance Manager Attorney at One Medical U.S.A. via the Filipino Bar Association of Northern California (“FBANC”), an attorney that deals with digital healthcare and liability.

Statements by the Privacy and Compliance Attorney in verbatim

For you to be able to provide your EMR as a service to covered entities who are subject to HIPAA, your EMR will need to be built in a HIPAA-compliant manner. Covered entities are required to ensure that any vendors who perform services on their behalf, such as a company storing and processing their data in an EMR, agree to also comply with HIPAA. This agreement is captured in what is known as a business associate agreement (BAA) which is a contract between the covered entity and the vendor (you). It is the covered entity's responsibility to execute this contract, not yours as the vendor.

Is an EMR in Notion safe, given that they have their SOC 2 Type 2 certification?

No, if Notion is not in compliance with HIPAA, then it is not safe to store protected health information (PHI) within their system. While a SOC 2 Type 2 certification may demonstrate a level of security sophistication and controls, HIPAA prescribes specific technical and administrative safeguards for the protection of health data that go above and beyond SOC 2.

A platform that is HIPAA compliant will usually have information about how their service can be configured to be HIPAA compliant (usually for a fee). For example, a standard everyday user of G-Suite isn't guaranteed HIPAA compliance with regards to their personal use of Gmail, Google Drive, etc. But someone who purchases G-Suite services that are HIPAA compliant must set up their environment in a certain way and enter into a BAA with Google.

Authorization for Release of Health Information—is this required?

It is the responsibility of the doctor, not the EMR vendor (you), to ensure that the HIPAA Notice of Privacy Practices (NPP) they give to each of their patients includes some information about the fact that their PHI may be disclosed to a third-party vendor in the course of their care. The doctor is

not required to obtain an authorization for the release of health information from each patient to use an EMR as it should be covered in their NPP.

Disclaimer on Segue main page ("Segue MediRecords is not responsible for any data loss/breaches")—is this sufficient?

No, you cannot disclaim liability for potential loss or breach of protected health information (PHI) in your EMR. As a business associate to a covered entity/doctor, when you enter a BAA with the covered entity, you are actually required to agree to be responsible for the potential loss or breach of data maintained in your system.

Are there templates for Terms & Conditions and a HIPAA Notice?

I would not recommend using a template for the terms and conditions of your service. I would advise that you work with legal counsel to craft terms and conditions specific to your product's intended audience, the product's anticipated use and your risk tolerance.

Do patients and doctors need to sign legal forms like NDAs, patient consent, and the likes to use Segue MediRecords?

The vendor would need to execute a contract with each doctor/covered entity who would use your service. Users would also need a business

associate agreement (BAA) between you (the vendor) and each doctor who utilizes your service, but it is the doctor's responsibility to execute this with you.

As far as patient-facing forms/documents, it would be the doctor's responsibility to ensure that their patients receive a HIPAA NPP which outlines that by virtue of being their patient, they agree to have their data stored, transmitted, used, etc. with certain vendors who are their business associates. There isn't something that you as the EMR vendor would need to worry about.

Cybersecurity

This portion consists of definitions and comparisons. The researchers would like to clarify that these are not part or from related literature. Rather, these were gathered by a series of inquiries personally made by the researchers to the cybersecurity head of Notion. The following were defined and discovered:

A contextualized definition of the SOC 2 report according to Notion

A SOC 2 report focusing on security is typically an excellent baseline for the controls that need to be in place to demonstrate HIPAA Security Rule compliance. Still, there are additional controls that should be considered when looking at HIPAA compliance. A SOC 2 provides a baseline for data security practices, but a HIPAA report has additional requirements that need to be met. A SOC 2 report alone will not typically be enough to demonstrate that an organization complies with the HIPAA Security Rule.

A contextualized comparison of SOC 2 and HIPAA according to Notion

SOC 2 security and HIPAA security are identical in terms of their assurance, but they serve distinct purposes. The Notion team, on the other hand, asserts that user data is secure because neither outside users nor

Notion themselves have access to it. Notion is SOC2 Type 2 certified, and it has previously passed security assessments conducted by big technology companies such as Pixar and Slack, among others. Notion is also subjected to independent quarterly audits by the NCC Group, which audits Salesforce and other large business organizations.

Researcher analysis on the cybersecurity and liability of Segue MediRecords

Notion.co offers the same levels of security to large companies like Pixar and Slack. However, as stated by the interviewed compliance attorney, the security provided by Notion is not sufficient. It is like comparing rubber and liquid erasers. It both erases typographic erasers, but it is made to erase writings from different tools and thus is inappropriate by design.

However, the researchers can still continue in their endeavors to help wide clinical adaptation by working with Notion and modifying their system to work in a way that is HIPAA-eligible, albeit at a pricier cost. Furthermore, it has been clarified that the doctor serving a patient is primarily responsible for ensuring that their consultation and patient information shared is in compliance with the HIPAA Notice of Privacy Practices (NPP). To reinforce this, the researchers designed Segue that renders the team from viewing patient information inputted by doctors.

Moving forward, the team was also advised to strengthen Segue's security system, since the team is still held reliable once a data breach occurs. That is why aside from improving the electronic medical record's current system, the team should partake in a legal consultation in order to ensure that the liability of Segue is covered in a contextual manner.

The attitudes of Doctors towards Segue MediRecords as measured by the Systems Usability Scale (SUS)

Segue is a new product. Like all products, it requires careful research for the researchers to ensure usability. Thus, the team behind Segue analyzed both the individual and results of the Systems Usability Scale both quantitatively and qualitatively. The researchers acknowledge the doctors' lack of time to explore the prototype and answer the prepared questionnaire as a delimiter of the study.

Profiles of the Doctor-respondents

Doctor No.	Specialization	Method of Consultation	Age Range	Frequency of Recording	Storage of patient info
1	Pediatrics	Face-to-Face	27 - 35	Always	On paper with a pen
2	Pediatrics	Face-to-Face	36 - 44	Always	On paper with a pen
3	Pediatrics	Face-to-Face	27 - 35	Always	On paper with a pen

4	Pediatrics	Face-to-Face	27 - 35	Always	On paper with a pen
5	Pediatrics	Virtual	27 - 35	Often	In an electronic medical record with my computer/phone
6	ob gyn	Face-to-Face	36 - 44	Always	On paper with a pen
7	Pediatrics	Face-to-Face	> 60	Always	In an electronic medical record with my computer/phone
8	Pediatrics	Face-to-Face	27 - 35	Always	On paper with a pen
9	Gen Practice	Virtual	> 60	Often	On paper with a pen
10	Pediatrics	Face-to-Face	27 - 35	Always	In an electronic medical record with my computer/phone

11	Pediatrics	Face-to-Face	27 - 35	Always	On paper with a pen
12	Pediatrics	Face-to-Face	27 - 35	Often	In my social media account or messages with my computer/phone

The analysis of the overall responses for Segue MediRecords

Overall Raw and Processed SUS Scores												
Doctor #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Raw SUS	26	28	25	29	24	28	23	29	27	28	38	27
Processed SUS	65	70	62.5	72.5	60	70	57.5	72.5	67.5	70	95	67.5
Final SUS Scores												
69 (B-)												

The results from the Systems Usability Scale (SUS) resulted in a 69 or B-. This is an appropriate score for Segue MediRecords, considering that the novel Electronic Medical Record has the ability to be a fit for doctors of the current time. Looking at the overall scores, the researchers can assume that the delimiter is the reason for the majority of the doctors' given score.

The pandemic, a Z variable, also influenced the results positively. Because every person was forced to work online, doctors, in this case, were able to navigate folders better. It is worth noting that these high scorers are also younger, which means they are better well-versed when it comes to handling computers and new technologies. This is why it can be inferred that doctor # 11, who is storing patient information with pen and paper, is able to give a high score to Segue MediRecords. These will be discussed more in the individual analysis later.

Given more time, doctors will be able to master Segue MediRecords. Simple navigation will become muscle memory, and with a few tutorials, they may be able to modify Segue MediRecords enough to fit their specific needs. The researchers behind Segue MediRecords will also make sure to improve accessibility and ease-of-use at the same time by working together with doctors and receiving user feedback continuously.

Individual question analysis of the doctors' responses

I would like to use Segue Frequently												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	**3**	**3**	**3**	**4**	**3**	**3**	**3**	**4**	**2**	**4**	**5**	**4**

The ratings "4" and "3" were frequently chosen by the doctors who reviewed Segue MediRecords. For a new product, this is an already strong indicator that our hypothesis will be fulfilled, since the desire to use a tool frequently translates to doctors perceiving and deeming it effective for their day-to-day use. However, seeing how doctor # 9 rated a two, the researchers will be contacting said doctor soon to receive more specific feedback, to see if the complaint is another opportunity to improve.

According to findings of Kalayou et al (2021), physicians' opinions about EMR in Norway are moderate. There was a positive correlation between computer ownership, computer literacy, inexperience with EMR, involvement in EMR training, and attitude toward EMR. Improving the components is crucial for physicians' perceptions toward EMR to change.

With the technological knowledge learned by doctors due to COVID-19, doctors can now navigate through the computer and the web with ease. With

the researchers' efforts in building on familiarity and the surge in patients, doctors now look forward to recording faster patient information with Segue.

I found Segue MediRecords unnecessarily complex.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	2	3	2	3	2	3	2	3	3	2	1	2

Five ratings of "3", which is almost 50% of the respondents, were observed. While this does not imply a negative review, this means that there are elements in Segue MediRecords that the researchers can work on. However, this should be no issue for the Segue's usability score, doctors can get up and running quickly, even if they just use the basic parts.

According to Janssen et al. (2021), digital technologies such as EMRs have the potential to significantly improve the quality, equity, and affordability of healthcare. The health industry, on the other hand, is still striving to adopt these technologies in a way that ensures their long-term use. Among the barriers to successful EMR installation are a steep learning curve required to become sufficiently acquainted with the EMR's feature set.

With this in mind, the researchers will exert extra effort to reduce the number of clicks and typing a doctor is required to do in order to simplify the entire process even further.

From my experience, Segue MediRecords was easy to use.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	3	3	4	4	2	5	3	4	3	4	5	4

The data shows that the numbers 3 and 4 appear frequently, indicating that the Segue MediRecords has received positive feedback on how simple it is to use. The data validated the alternative hypothesis that Segue MediRecords' Systems Usability Scale (SUS) score is equal to or greater than 68, the average score. As a result, the null hypothesis should be rejected and the alternative hypothesis should be accepted.

The results of the research reported in the Review of Related Literature regarding the use of an Electronic Medical Record were different. It was found in previous studies that “Electronic health records, on the other hand, will necessitate the use of a software developer to make changes to the code and back-end systems. This is both time-consuming and expensive.”

Contrary to the results of the data, which had positive feedback about the usability of Segue MediRecords.

In conclusion, the ease with which Segue MediRecords can be used has been praised by many who have used it. This is a reasonable expectation because Segue MediRecords is designed to be simple to use and navigate through.

I think that I would need the support of a technical person to be able to use Segue MediRecords.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	3	2	3	2	3	3	3	2	2	3	2	3

The numbers 2 and 3 appear frequently in the data, indicating that Segue MediRecords has gotten positive feedback. Getting a low score like 2 is excellent since it means they won't require technical assistance to access, and use Segue MediRecords. The data validated the alternative hypothesis that Segue MediRecords' Systems Usability Scale (SUS) score is equal to or greater than 68, the average score. As a result, the null hypothesis should be rejected, and the alternative hypothesis should be accepted.

The data from the research published in the Review of Related Literature on the requirement for a technical person when using an Electronic Medical Record came up with the same conclusion. Previous study has discovered that "Paper records necessitate the hiring of additional employees to manage paper files and organize many papers. A platform for electronic medical records requires no physical storage space, fewer employees, and less of your time." This means that it will not be necessary to have a technical person to be able to use an Electronic Medical Record.

In conclusion, the requirement for a technical person in order to use Segue MediRecords resulted in a negative response from the participants. In other words, Segue MediRecords is user-friendly, which implies that anyone can easily operate it.

I found the various features in Segue MediRecords useful and well-integrated.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	3	4	3	5	4	5	3	4	5	4	5	3

The digits 3, 4, and 5 occur often in the table above. These high rankings imply that they find Segue MediRecords' numerous features to be

valuable and well-integrated. The findings supported the alternative hypothesis that the MediRecords Systematic Use Scale (SUS) score was equivalent to or higher than the mean score of 68. As a result, the null hypothesis should be rejected and the alternative hypothesis should be accepted.

The data came to the same conclusion, according to a study published by Atreja, Gordon, Olmsted, Pollock et al. and Practice fusion in the Review of Related Literature discovered in the Electronic Medical Records (EMR) and its Advantages states that electronic health record systems may contain clinically beneficial features including electronic warnings, guideline reminders, and automated monitoring of quality of care indicators and reducing costs via fewer paperwork, greater safety, reduced testing duplication, and improved health. These results indicate that the features discovered and incorporated in the Segue MediRecords are both valuable and well-integrated.

The participants responded well to the various features of Segue MediRecords. In conclusion, Segue MediRecords provides a number of valuable and well-integrated features that makes working with EMRs more convenient and efficient.

I thought there was too much inconsistency in Segue MediRecords.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	2	1	2	3	3	1	2	2	2	2	2	2

In the data above, the digits 1 and 2 occur often. These low ratings imply that they do not believe Segue MediRecords had too much inconsistency. The results supported the null hypothesis that the MediRecords Systematic Use Scale (SUS) score was equal to or less than 51, the mean. As a result, the null hypothesis must be accepted, whereas the alternative hypothesis must be rejected.

Health record (EMR) systems, with the goals of improving patient care and outcomes; increasing efficiency and lowering costs; improving billing procedures; reducing the frequency of lost records, data, and medication errors; providing better access to patient histories; and integrating clinically useful features, according to the data from the researches by Atreja, Gordon, Olmsted, Pollock et al. in the Review of Related Literature. Medical professionals believe Segue MediRecords has no or little consistency.

In conclusion to the data provided, the features and Segue MediRecords have no inconsistencies.

I would imagine that most physicians would learn to use Segue MediRecords very quickly.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	4	4	3	5	3	5	3	4	4	3	5	3

In this set of data, the ratings of 3 and 4 are commonly seen, indicating that the doctors were positive about the research study's results. The fact that the Segue MediRecords has received these scores indicates that the participants are able to master the system rapidly. Segue MediRecords' Systems Usability Scale (SUS) score is equivalent to or more than 68, the average score, and the data verified this alternative hypothesis, according to the findings. For this, the hypothesis is rejected, and the alternative hypothesis should be acknowledged as the optimal solution.

The data from the research supported the earlier studies' theories when using Electronic Medical Records (EMRs) and agree with the rating of the results. Lambooij, Drewes, and Koster state that "Doctors and nurses agree that an EMR that is easier to work with and better aligned with their work has more added value, but for the doctors this is more pronounced. The doctors and nurses perceive that the quality of the patient data is better when EMRs are easier to use and better aligned with their daily routine.”.

In conclusion, Segue MediRecords is easy to learn by the physicians. Seeing how it was an easily operated platform by the participants.

I found Segue MediRecords awkward to use.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	2	2	2	3	2	3	3	1	2	2	1	2

In this collected data, the rating of 2 is commonly occurring, indicating that the doctors were pleased with the findings of the research study in general. That Segue MediRecords has received these results implies that the participants find it convenient to utilize the system in a short amount of time. Segue MediRecords' Systems Usability Scale (SUS) score is equivalent to or more than 68, the average score, and the data verified this alternative hypothesis, according to the findings. For this, the hypothesis is rejected, and the alternative hypothesis should be acknowledged as the optimal solution.

When employing Electronic Medical Records (EMRs), the data from the research study confirmed the hypotheses of prior studies, and the findings were rated in accordance with the rating system. According to Buchbinder and Shanks, “EMR is a powerful tool that not only enhances the caregiver’s

ability to deliver and document care, but it also provides easy and accessible aggregate and comparison data.” which means that using this platform of Segue MediRecords is an explicate usage.

In conclusion, the physicians will find the software of Segue MediRecords to be flexible. Segue MediRecords is a platform that is convenient and comfortable to use for participants.

I felt very confident and hopeful using Segue MediRecords.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	5	4	4	5	4	3	3	4	3	4	5	4

The data shows that 3, 4 and 5 appear frequently, suggesting that Segue MediRecords has received favorable feedback on how doctors feel confident and hopeful in using Segue MediRecords. The numbers indicate that doctors consider Segue MediRecords reliable when it comes to handling and filling out notes, which is one of Segue's objectives. The findings confirm the alternative hypothesis that the Systems Usability Scale (SUS) score for Segue MediRecords is equal to or higher than 68, the average score. As a result, the null hypothesis should be rejected, and the alternative hypothesis should be accepted.

The data from the Review of Related Literature on the Advantages of Electronic Health Records reached the same result in where physicians find Segue MediRecords credible for use. Based on the data,

In conclusion, the use of Segue MediRecords has benefited doctors substantially, resulting in an overwhelmingly positive response. Making it confidently convenient for physicians to use Segue MediRecords in their regular practices.

I need to learn a lot of things before I can properly utilize Segue MediRecords.												
Doctor #	1	2	3	4	5	6	7	8	9	10	11	12
Rating #	3	2	3	3	2	3	2	3	1	2	1	2

The data indicates that 1, 2, and 3 are commonly mentioned, implying that Segue MediRecords has gotten positive feedback regarding how doctors confidently find Segue MediRecords easy to access and utilize without investing time and effort in learning about it. One of Segue's major goals is to make it hassle-free for doctors and convenient for them to use without encountering any difficulties when conducting patient forms. The data support the alternative hypothesis that Segue MediRecords' Systems

Usability Scale (SUS) score is equal to or greater than 68, the average score. As a result, the null hypothesis should be rejected in favor of the alternate hypothesis.

The data from the research published in the Review of Related Literature on The Benefits of Keeping Medical Records on Paper and the Standards of EMR arrived at the same conclusion, suggesting that there are several benefits, including how Segue MediRecords is simple to use and convenient for Doctors.

In conclusion, the validity and accessibility of Segue MediRecords have increased physician confidence, allowing for easy access. Providing physicians with the comfort and convenience to employ Segue MediRecords in their everyday practice.

Chapter V Conclusion

The COVID 19 pandemic places large emphasis on the role of data, where lives can be saved or wasted based on the availability of patient information. The researchers developed Segue MediRecords in hopes of improving the current health information systems of the doctors in Cebu, Philippines. They measured the effectiveness and readiness of said system by building features, receiving legal counseling, and conducting a usability test with twelve doctors.

Segue MediRecords was developed with five core features: the ability to store cloud patient information, resources for doctors, pre-made medical records, and other miscellaneous features to encourage efficiency in the storage of information. Doctors deemed the features sufficient. The Systems Usability Tests resulted in a favorable score for Segue MediRecords. With doctors giving it an average score of B-. However, the strength of this test was moderated by a lack of time for navigation and demographic information: younger people are observed to give Segue a higher score. The said electronic medical records system also needs rework with its security system. An effort achievable in a small amount of time.

Future research into the appropriate features should be pursued in order to improve the effectiveness of this app. Efforts into turning Segue MediRecords "smart" in the means of suggestions by A.I. can be

implemented to reduce the efforts applied by doctors. Additional research in enabling offline usage specifically in Notion can also aid rural doctors tend to their patients more effectively. Finally, the researchers also suggest looking into data importing so that doctors will be able to move all their patient data from their previous patient information storage system to Segue.

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Appendices

Appendix A

TRANSMITTAL LETTERS

Transmittal Letter Addressed to the School Head of Science and Technology Education Center - Senior High School

MR. SEVERIANO B. AMISTAD

Chief Academic Officer

Dear Mr. Severiano,

I am writing this letter to ask permission for the conduct of a study on, "SEGUE MEDIRECORDS" in partial fulfillment for the course Inquiries, Investigations and Immersion in Science, Technology, Engineering, and Mathematics (STEM) strand at the Science Technology Education Center - Senior High School Basak Campus (STEC-SHS).

The study requires a maximum of 15-20 minutes of a doctor's free time at their convenient time to answer the UX Task Survey. The findings of the study will be the basis for an action plan to help reduce medical negligence and introduce a more effective patient storage system for the doctors of Cebu City.

Thank you for your favorable response to my request.

Yours truly,

CARL VINCENT L. KHO

Researcher

Noted:

ALLAN S. ADEM, EdD

Adviser

Approved:

MR. SEVERIANO B. AMISTAD

School Head

Appendix B

INFORMED CONSENT

Dear Respondent,

Good day!

I am developing a digital Electronic Medical Record (EMR) solution called Segue MediRecords. By knowing your ideas about this matter, I can develop additional features and strategies to effectively implement this system for local small-scale physicians.

Rest assured that all the answers you give will be kept strictly confidential. Your participation in this study is voluntary and you have the right not to answer any question. If you have any questions to ask about anything that is not clear or need more information, I am willing to provide it through my mobile number.

I, therefore, invite and welcome you to take part in this study.

Thank you very much.

Truly,

Carl Vincent L. Kho

Researcher

Mobile no: 0916*******

Appendix C

QUESTIONNAIRES

Source: The System Usability Scale (SUS) provides a "quick and dirty", reliable tool for measuring the usability. It consists of a 10-item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree. Originally created by John Brooke in 1986, it allows you to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications.

PART 1: DEMOGRAPHICS

Please answer the following personal questions. Your data will be used for demographic purposes only. No identifying information will be revealed.

1. What field of medicine is your specialty?
2. Where do you tend to your patients now?
    a. Face-to-Face
    b. Virtual
3. What age range do you belong in?
    a. < 26
    b. 27 - 35

c. 36 - 44

d. 45 - 51

e. > 60

4. During the pandemic, how often do you record patient information?

a. Always

b. Often

c. Sometimes

d. Rarely

e. Never

5. When and how do you store them?

a. On paper with a pen

b. In my social media account or messages with my computer/phone

c. In an electronic medical record with my computer/phone

PART 2: THE SYSTEMS USABILITY SCALE (SUS)

DIRECTION: Answer the following statements based on your honest observations and experiences with Segue MediRecords. Please choose the score that best describes your experiences corresponding to the following statements after learning about and using Segue MediRecords. Description of your experiences will be measured on a four-point scale labeled, as: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1).

#	Based on the product demo, doctors find Segue MediRecords to be:	**Strongly Agree** (5)	**Agree** (4)	**Neutral** (3)	**Disagree** (2)	**Strongly Disagree** (1)
Systems Usability Scale (SUS)						
1	I would like to use Segue MediRecords frequently.	5	4	3	2	1

2	I found Segue MediRecords unnecessarily complex.	5	4	3	2	1
3	From my experience, Segue MediRecords was easy to use.	5	4	3	2	1
4	I think that I would need the support of a technical person to be able to use Segue MediRecords.	5	4	3	2	1
5	I found the various features in Segue MediRecords useful and well-integrated.	5	4	3	2	1
6	I thought there was too much inconsistency in Segue MediRecords.	5	4	3	2	1
7	I would imagine that most physicians would learn to	5	4	3	2	1

	use Segue MediRecords very quickly.					
8	I found Segue MediRecords awkward to use.	5	4	3	2	1
9	I felt very confident and hopeful using Segue MediRecords.	5	4	3	2	1
10	I need to learn a lot of things before I can properly utilize Segue MediRecords.	5	4	3	2	1

Appendix D

PARENTS CONSENT

SCIENCE AND TECHNOLOGY CENTER

SENIOR HIGH SCHOOL DEPARTMENT

Basak, Lapu-Lapu City

PARENT/GUARDIAN/CAREER CONSENT FORM

Instruction: Please complete the following, sign, and return to:

Mr. Allan S. Adem, STEC Research Adviser

Name of student: _____ Age: _____ **Name of Parent/Guardian: _____**

Address: _____ Mobile:

_____

Family Doctor …… Doctor's Tel No: ……

Does your child suffer from any medical conditions/allergies that the teacher/ coach should be aware of (including any current medication)?

.....

.....

Please provide details of medication that must be administered:

_____

_____

Emergency contact details: (If different from above)

Name: …… Telephone no: ……..……

Relationship to child: ……..……

CONSENT (please read carefully)

a) I agree to my son/ daughter taking part in the Field Work/Immersion in partial fulfilment of the Research Course Work to develop the independent and critical skills of the students.
b) I confirm to the best of my knowledge that my son/ daughter does not suffer from any medical condition other than those listed above.
c) I fully support the research undertaking of my son/daughter through minimal financial cost and through my attendance/presence if so desired.

d) I consent to my son/ daughter traveling by any form of public transport, minibus or motor vehicle by land or water while gathering research data.
e) I understand that the teacher/school accepts no responsibility for any untoward incident, damage or injury caused by or during attendance based on the attached schedules of the field work/gathering data.

Signed ……..…… (Parent/ Guardian)

Date: ……

(Append approved transmittal letter, budget costing, and field schedules)

Appendix E

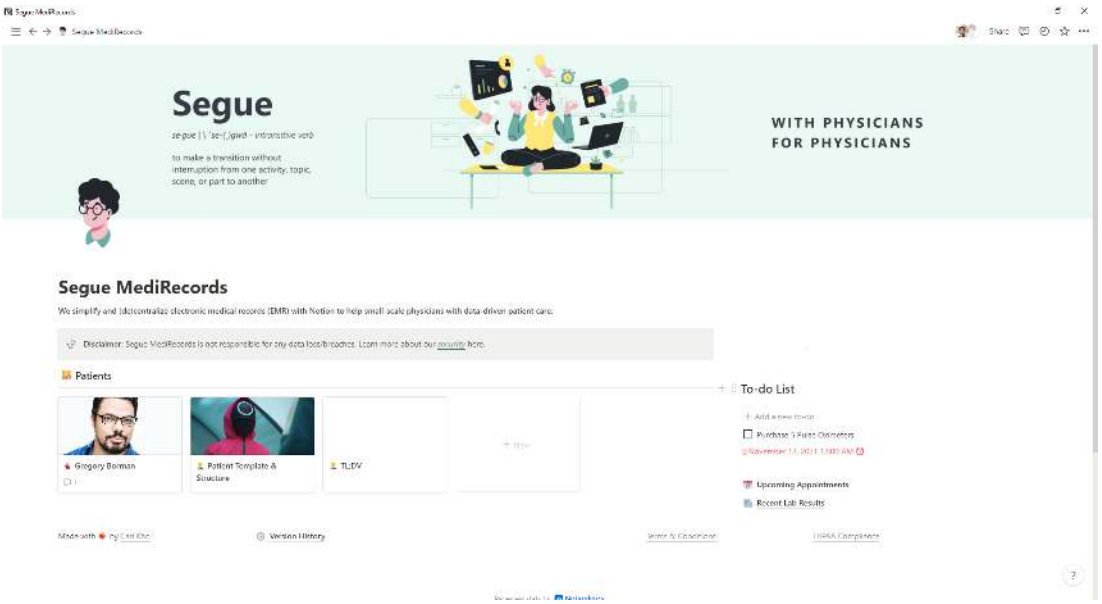
RESEARCH TIMETABLE

DATE	ACTIVITY/ PROCESS
09/15/21	Orientation
09/15/21	Problem Development and Refinement
09/15/21	Approval of Research Problem and Title
05/03/21	Writing of the Rationale
09/19/21	Review of Literature and Studies/ Identification of Anchor Theories
09/19/21	Writing the Theoretical Background / Literature Background
09/23/21	Determination of Beneficiaries/ Writing of the Significance of the Study

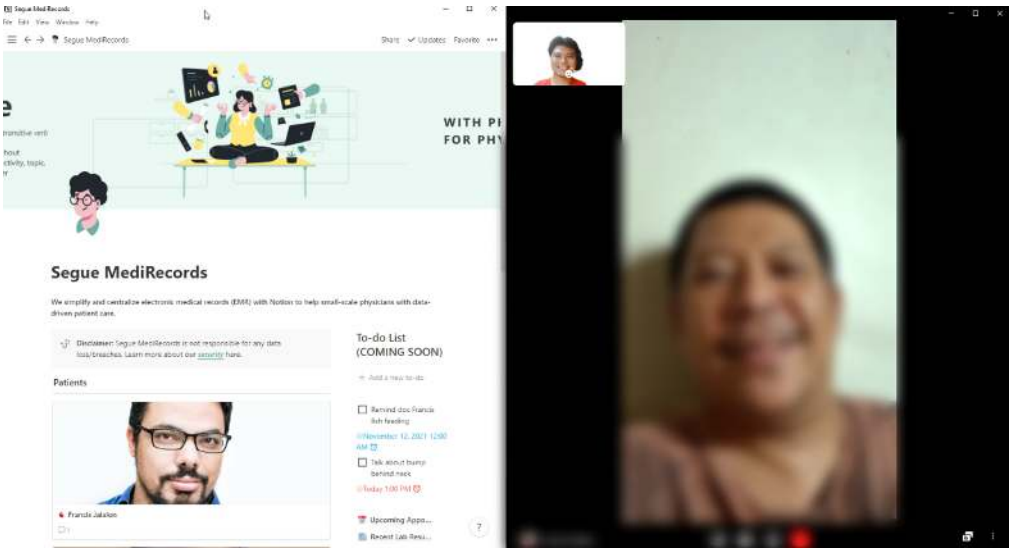
	Writing of the Definition of Terms
10/06/21	Determination of the Research Design
10/09/21	Development/ Writing/ Refinement of Methodology
10/13/21	Finalization of Research Design Manuscript
	Submission of Research Design (Chapter I) for Proposal Hearing
10/19/21	Processing of Forms for Proposal Hearing
10/20/21	Proposal Hearing
02/02/22	Submission of Hardbound Copies

SUMMARY OF BUDGET

	Php
Notion	**0.00 PHP**
Notion API	**0.00 PHP**
Google AppScript	**0.00 PHP**
Google Suite (Docs, Sheets, and Forms)	**0.00 PHP**
TOTAL	**0.00 PHP**

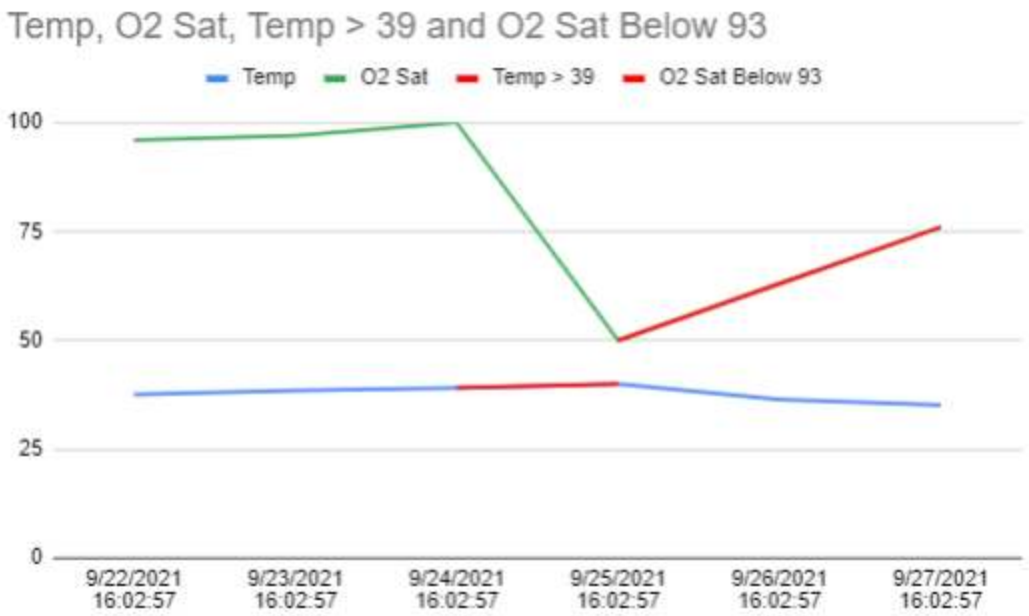


Live Preview to Segue MediRecords [(Access here)]



First doctor user from the University of Cebu - Medicine at Sep 9, 2021

Segue MediRecords as the only PH finalist in CodeForAsia's Codeathon X



Smart "Warning Chart' for COVID Monitoring

A slide in Segue's Pitchdeck for Codeathon X [(View Here)]

Building Segue in Public with Twitter [(View Here)]