International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 04 Issue: 06 | June – 2025 DOI: 10.55041/ISJEM04015
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata

ALTRUIST APP- FOR PATIENT IN RURAL PEOPLE DOCTOR MANAGEMENT SYSTEM

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ABSTRACT

Epidemiological cohort studies are essential for determining participant risk variables for a range of outcomes. Because of recruitment and long-term follow-up, these studies are frequently expensive and time-consuming. As online patient communities frequently exchange information about their conditions, social media (SM) data has become an important supplementary source for digital epidemiology and health research. In this work, we present ALTRUIST, an open-source Python module that makes it possible to generate VDCS on SM in a consistent manner. Data collection, preprocessing, and analysis procedures that resemble those of a conventional cohort research are made easier with ALTRUIST. To demonstrate the methodology, we present a real-world use case that focuses on diabetes. We illustrate the potential of VDCS as a crucial tool for certain research issues by utilizing SM data, which provides extensive and reasonably priced information on users' health.A web-based application called the Health Monitoring System was created with the Django framework with the goal of simplifying doctor-patient interactions and patient health management. In addition to giving clinicians the resources they need to effectively manage visits and analyze patient progress, this system allows patients to schedule appointments with physicians, track health metrics, and access their medical history. The main elements are a doctor portal for seeing patient information, controlling availability, and recording consultations, and a patient site for making appointments, submitting symptoms, and examining medical records. This system is a versatile answer to contemporary healthcare requirements because of its scalability, which permits integration with wearable technology and other health monitoring instruments.

KEYWORDS: Machine learning Algorithm (ML), social media (SM), Electronics health record (EHR), Health Insurance Portability and Accountability Act (HIPAA).

I. INTRODUCTION

A COHORT is a study design that advances epidemiological knowledge by doing research in human populations. These are longitudinal studies that track research participants over time along with various aspects of their lives (such as social difficulties and health). Such a study's approach can be broken down into five steps: 1) recruiting participants from the target group, 2) gathering baseline exposure data, 3) population selection, 4) follow-up and outcome of interest identification, and 5) data analysis based on exposure and outcome of interest.

Traditional cohort studies do, however, have a number of drawbacks. First of all, they are expensive and time-consuming because it may take years to gather enough data for analysis after the cohort group is recruited. Second, cohorts have a comparatively extended time horizon for return on investment because the process can take many years. Third, they are not appropriate for tracking long-latency or unusual disorders. Fourth, maintaining participant follow-up and reducing attrition over time may prove challenging. Our team recently presented the idea of a virtual digital cohort study (VDCS), which is based on social media data, as an approach that complements traditional cohorts. The vast amount of data that people create online is becoming increasingly pertinent to the study of health-related subjects like hiring or data analysis.

A contemporary web-based healthcare application that responds to the increasing demand for easily accessible, effective, and patient-centered medical services is the Smart Health Monitoring System Using Django. By changing the way patients and healthcare professionals interact, it provides a creative answer to conventional healthcare problems. Conventional healthcare models usually function in a reactive manner, with people only seeking medical attention when problems occur. This frequently leads to a lack of proactive health management and treatment delays, which can raise healthcare expenditures and result in worse patient outcomes. On the other hand, the Smart Health Monitoring System takes a proactive stance by combining data tracking, real-time health monitoring, and easy appointment scheduling, enabling an ongoing and engaging healthcare experience.

The system was created with patients and healthcare practitioners in mind, utilizing the safe and expandable Django framework. Patients may take charge of their health information thanks to the user-friendly patient portal. In a single location, patients can conveniently register, log in, update health measurements, schedule visits, and keep track of their medical history. In addition to allowing patients to enter critical health measurements like blood pressure and glucose levels, the system may eventually allow connectivity with wearable technology, allowing for real-time health tracking. This feature gives patients a sense of control over their health journey by enabling them to proactively discuss health problems with their physicians. Additionally, patients can schedule consultations whenever it is most convenient for them, eliminating the need for lengthy wait times or time-consuming phone calls, thanks to the appointment scheduling tool.

Healthcare practitioners may obtain vital information prior to consultations thanks to the doctor dashboard, which centralizes patient data, appointment scheduling, and real-time health monitoring. Viewing a patient's vital signs, medical history, and current prescriptions gives doctors the information they need to create individualized treatment strategies. Physicians are able to provide more individualized, knowledgeable, and efficient care with this degree of data access. The interface of the system simplifies appointment scheduling, allowing physicians to effectively manage patient visits and set availability. This lessens the administrative burden, eliminates the need for duplicative paperwork, and frees up physicians to concentrate on providing high-quality care.

The Smart Health Monitoring System's capacity to track data in real time is one of its best features. Wearable technology and other medical equipment can be integrated to allow patients to continuously monitor vital signs including blood pressure, oxygen saturation, and heart rate. Doctors can remotely monitor patient health thanks to this data, which is automatically submitted to the site. Early intervention is made possible by this ongoing monitoring; even before patients show obvious symptoms, clinicians can be notified and take immediate action if abnormal readings are found. In addition to improving patient outcomes, this proactive strategy lowers hospital stays and medical expenses related to untreated chronic illnesses including diabetes and hypertension.

All things considered, by enabling a smooth, integrated approach to patient management, the Smart Health Monitoring System Using Django transforms the delivery of healthcare. It supports a more integrated, effective healthcare experience, gives people the power to actively participate in their health, and equips medical professionals with the resources they need to provide individualized treatment. The method encourages better doctor-patient interactions and a higher standard of care by reducing the communication gap between patients and physicians and encouraging proactive health management. This creative strategy is a big step toward the future of healthcare, where real-time health data and ongoing monitoring enhance preventive and individualized care, making healthcare more affordable, effective, and suited to the needs of each patient.

II. RELATED WORKS

EHR based Deep Learning

EHR research has focused on deep learning, with a variety of methods being put forth. For example, Lipton et al. [40] applied sequential real-valued measurements of 13 vital signs to EHR phenotyping using long short-term memory (LSTM) networks [27] in order to predict one of 128 diagnoses. Choi et al. [12] demonstrated the advantages of knowledge transfer from larger to smaller datasets by proposing a multitask learning framework for phenotyping that uses gated recurrent units (GRUs) [10].

To improve the model's interpretability, they also created the reverse temporal attention model (RETAIN), a bidirectional attention-based model [11]. A benchmark approach was provided by Harutyunyan et al. [22] for assessing EHR models.

Notably, on EHR data, simpler models—like linear ones—frequently perform competitively [1], [4], [48], and [55]. Instead of training end-to-end from raw EHR data, these models typically rely on manual feature engineering to create patient state vectors from longitudinal health data. SANS Formers, on the other hand, aims to avoid the requirement for intensive feature engineering while preserving the ease of use and effectiveness of non attention-based designs by directly utilizing raw longitudinal EHR data.

The need for development in the healthcare industry is growing at ever-increasing rates. High-quality medical facilities backed by more recent and sophisticated technologies are needed today. In this case, blockchain would be essential to changing the healthcare industry. Furthermore, the health system is shifting toward a patient entered approach that emphasizes two key elements: always available healthcare resources and easily accessible services. The Blockchain helps healthcare organizations deliver high-quality medical facilities and appropriate patient care. Another laborious and repetitive procedure that raises the costs of the health sector is health information exchange, which may be swiftly resolved with the use of this technology. Blockchain technology allows citizens to participate in health research initiatives. Furthermore, improved studies and data on public health will improve care for various populations. The entire healthcare system and organizations are managed by a centralized database [[13], [14], [15]].

Up until now, the biggest issues in population health management have been interoperability, data sharing, and protection. Blockchain technology provides a reliable solution to this specific issue. When properly deployed, this technology improves security, data interchange, interoperability, integrity, and real-time updating and access. Data security is another major issue, particularly in the wearables and personalized medicine sectors. Blockchain technology is used to address these problems because patients and medical professionals need simple, safe ways to record, send, and consult data via networks without worrying about safety. [16,17].

III. PROBLEM DEFINITION

The current healthcare systems frequently use antiquated techniques that are inefficient and lack integration, which makes managing and caring for patients extremely difficult. Patients' ability to quickly access their medical information is hampered by the fact that many healthcare facilities still use manual appointment scheduling and paper-based data. Decisions on therapy are delayed as a result of this circumstance, especially in emergency situations.

Additionally, patients who are attempting to communicate with their healthcare professionals may encounter lengthy wait times and stressful encounters due to the inconvenient and prone to errors nature of traditional appointment administration. Due to these systems' reactive character, patients usually only seek medical help when problems occur, which results in lost opportunities for preventive care.

Misunderstandings regarding treatment regimens may arise because patient-provider communication frequently takes place over the phone or in person. Concerns regarding compliance with laws like HIPAA are also raised by the compromise of patient

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privacy caused by disjointed data management and a lack of strong security measures. Patients frequently have limited access to their health data, which limits their involvement in controlling their own care, and manual data entry raises the possibility of errors**.**

IV. METHODOLOGIES

The Intelligent Health Tracking System By offering an integrated, user-friendly platform that boosts patient participation and increases the effectiveness of healthcare delivery, Django seeks to address the shortcomings of current healthcare systems. This web application makes use of Django's powerful framework to establish a scalable and safe environment for patients and healthcare professionals.

Through a dedicated patient portal, patients may conveniently access their medical records, track their health metrics in real time, and make appointments with healthcare providers under the proposed system. Patients are empowered to actively control their health thanks to this accessibility, which also makes prompt medical treatments possible. To lessen the possibility of missed appointments, the system also incorporates automated appointment reminders.

The technology gives medical professionals a thorough dashboard that makes scheduling appointments easier and makes patient information easily accessible, allowing them to make well-informed decisions during consultations. Proactive management of chronic illnesses is made possible by continuous vital sign surveillance made possible by real-time health monitoring.

V. ARCHITECTURE DIAGRAM

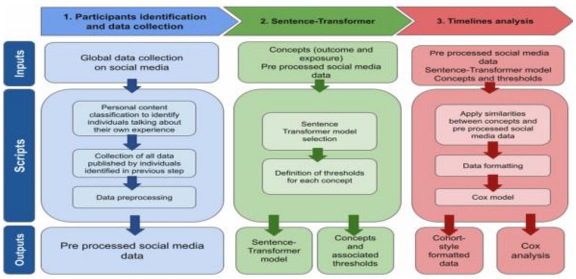

Fig 1 Architecture diagram

The process and end result of planning, creating, and building buildings and other physical structures are both graphically represented by architecture diagrams. In the tangible form of structures, architectural creations are frequently seen as both artistic and cultural symbols. The surviving architectural accomplishments of historical civilizations are frequently used to identify them.

PROPOSED PROCESS

- User Analysis
- Patient Details Analysis
- Appointment monitoring
- Health Monitoring process
- Prediction Analysis

USER ANALYSIS

The User Management Module makes sure that user accounts are managed effectively and securely, giving administrators, physicians, and patients a smooth experience. This module establishes the groundwork for safe access and customized interactions within the Smart Health Monitoring System by integrating strong registration, authentication, and management procedures.

PATIENT DETAILS ANALYSIS

Patients can access their medical history, manage their health records, and examine and update their personal information with the help of the Patient Management Module. Additionally, it makes booking appointments easier, guaranteeing smooth communication between patients and medical professionals for improved health results.

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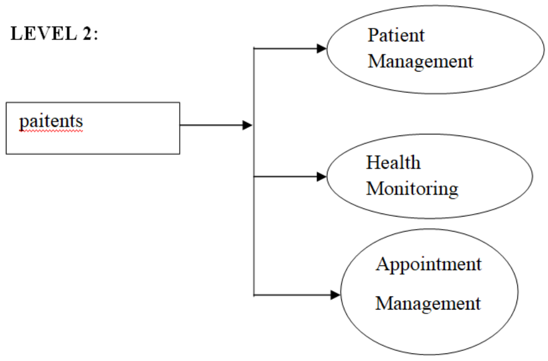

Figure 2 User analysis

APPOINTMENT MONITORING

Patients can simply arrange, reschedule, or cancel appointments with their doctors using the Appointment Management Module. In order to minimize missed appointments and improve patient involvement, it allows doctors to check their schedules, effectively manage appointments, and automatically remind patients and doctors.

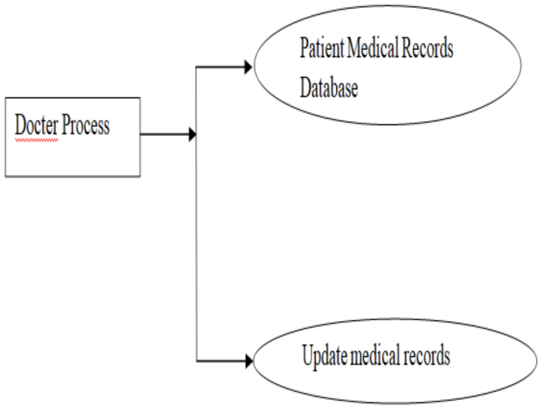

Figure 3 Updated details

HEALTH MONITORING PROCESS

Patients can enter and monitor their vital indicators, including heart rate, blood pressure, and others, using the Health Monitoring Module. By analyzing this data to find patterns and offering tailored comments and suggestions, it enables patients to actively manage their health and enables physicians to efficiently track their progress.

PREDICTION ANALYSIS

Our emphasis on distinct patient subgroups—those with a particular rare disease diagnosis—means that patient history must only be taken into account up until the diagnosis's initial occurrence. This setting places limitations on the amount of temporal data and the number of disease-specific subgroups that can be used for prediction tasks.

Our assignment also addresses another issue that frequently arises in the distribution of healthcare resources: forecasts for a given year usually only take into account data from the year before. Limited patient histories, people switching healthcare providers, and the yearly cycle of resource allocation are some of the factors that contribute to this practice.

FLOW ANALYSIS

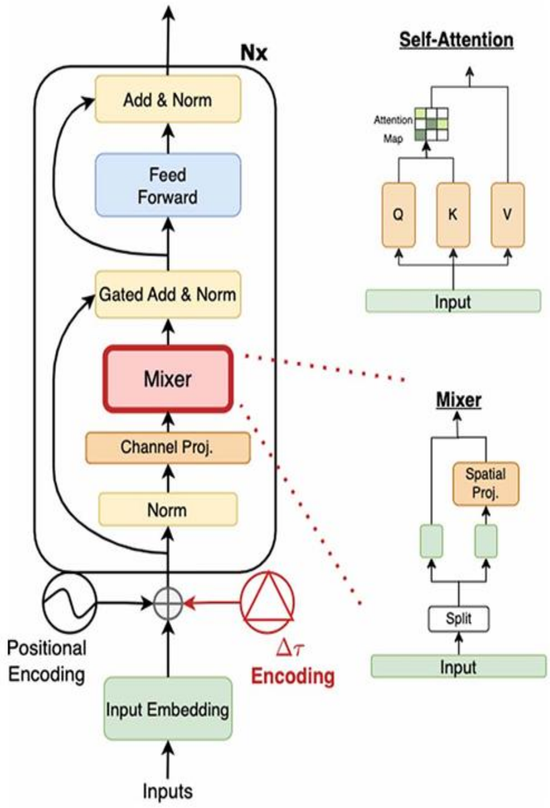

Figure 4 Overall flow process

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RESULTS AND DISCUSSION

Figure 7 depicts the response-time statistics of the proposed scheme and other related schemes that can fully provide the registration phase, PHI uploading phase, PHI access, and emergency-exception-handling phase, including the schemes of Hu et al. [3], Ray and Biswas [5], and Ray and Biswas [7]. The suggested technique outperforms existing relevant systems in the registration phase, increasing computing performance by at least 63.0% in the PHI uploading phase and at least 54.9% in the emergency-exception-handling phase. The suggested approach takes into account PHI uploading, access, and **emergency exceptions, and it only uses extended chaotic maps, symmetric en/decryptions,** and hash operations, all of which are computationally efficient. As a result, the proposed system not only increases functionality, but also retains efficiency in computations.

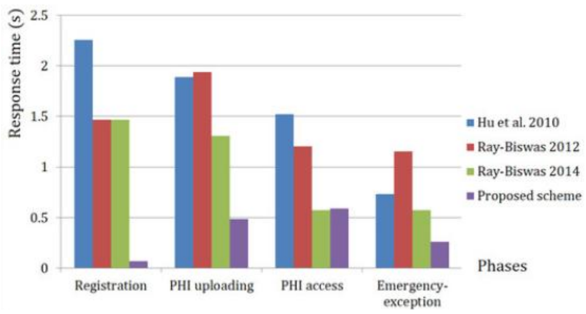

Figure 7

VI. CONCLUSION

In the EHR sector, this research introduced attention-free MLP models which have shown competitive performance in computer vision and natural language processing tasks in the past. Specifically, the suggested SANS former model demonstrated strong performance on a range of tasks and datasets.

To make it easier to generate and analyze VDCS from social media data, we created an open-source Python module. It is a simple tool that health researchers can use to conduct digital epidemiology initiatives. This approach puts the participants' welfare first and is consistent with the minimally disruptive clinical research philosophy. It provides thorough and significant information without requiring direct patient participation. We advise consulting the original methodological paper on VDCS in order to ascertain whether the strategy is appropriate for a particular research question. These findings highlight how self-supervised pretraining on the general population has a significant potential to improve prediction accuracy across model architectures in disparate subgroups, thereby bolstering subgroup-specific prediction models that are crucial for allocating precious healthcare resources. An intriguing expansion of this work would be interpreting the features that SANS former models learn and contrasting them with features created by subject matter specialists.

VII. REFERENCE

[1] D. Barrett and H. Noble, “What are cohort studies?,” Evid Based Nurs., vol. 22, pp. 95–96, 2019.

[2] “Cohort study,” Feb. 2013. [Online]. Available: https://www.iwh.on.ca/ what-researchers-mean-by/cohort-study

[3] M. S. Setia, “Methodology series module 1: Cohort studies,” Indian J. Dermatol., vol. 61, pp. 21–25, 2016.

[4] J. W. Song and K. C. Chung, “Observational studies: Cohort and case control studies,” Plast Reconstr Surg., vol. 126, pp. 2234–2242, 2010.

[5] G. Fagherazzi, C. Bour, and A. Ahne, “Emulating a virtual digital cohort study based on social media data as a complementary approach to tra ditional epidemiology: When, what for, and how?,” Diabetes Epidemiol. Manage., vol. 7, 2022, Art. no. 100085.

[6] C. Bour, A. Ahne, S. Schmitz, C. Perchoux, C. Dessenne, and G. Fagher azzi, “The use of social media for health research purposes: Scoping review,” J. Med. Internet Res., vol. 23, 2021, Art. no. e25736.

[7] D.Arigo, S. Pagoto, L. Carter-Harris, S. E. Lillie, and C. Nebeker, “Using social media for health research: Methodological and ethical considera tions

for recruitment and intervention delivery," Digit Health, vol. 4, 2018, Art. no. 2055207618771757.

[8]K.Makice,TwitterAPI:UpandRunning:LearnHow toBuildApplications With the Twitter API, Sebastopol, CA, USA: O'Reilly Media, Inc., 2009.

[9] S. Aslam, "Twitter by the numbers (2023): Stats, demographics & Fun Facts," in Omnicore Agency, Mar. 9, 2023. [Online]. Available: https:// www.omnicoreagency.com/twitter-statistics/

[10] C. Bour et al., "Global diabetes burden: Analysis of regional differences to improve diabetes care," BMJ Open Diabetes Res Care, vol. 10, 2022, Art. no. e003040, doi: 10.2139/ssrn.4128868.

[11] A. Sinha, T. Porter, and A. Wilson, "The use of online health forums by patients with chronic cough: Qualitative study," J. Med. Internet Res., vol. 20, 2018, Art. no. e19.

[12] L. J. Finney Rutten, K. D. Blake, A. J. Greenberg-Worisek, S. V. Allen, R. P. Moser, and B. W. Hesse, "Online Health Information Seeking Among USAdults:MeasuringProgressTowardaHealthyPeople2020Objective," Public Health Rep., vol. 134, pp. 617–625, 2019.

[13] A. M. Abu Dabrh, K. Gallacher, K. R. Boehmer, I. G. Hargraves, and F. S. Mair, "Minimally disruptive medicine: The evidence and conceptual progress supporting a new era of healthcare," J. Roy. College Physicians Edinburgh, vol. 45, pp. 114–117, 2015.

[14] Drake Van, Python 3 Reference Manual, Scotts Valley, CA, USA: Cre ateSpace, 2009.

[15] N. Reimers and I. Gurevych, "Sentence-BERT: Sentence embeddings using siamese BERT-networks," 2019, arXiv: 1908.10084.

[16] S. Bradshaw, E. Brazil, and K. Chodorow, MongoDB: The Definitive Guide: Powerful and Scalable Data Storage, Sebastopol, CA, USA: O'Reilly Media, Inc., 2019.

[17] J.Devlin,M.-W.Chang,K.Lee,andK.Toutanova,"BERT:Pre-trainingof deep bidirectional transformers for language understanding," 2018, arXiv: 1810.04805.

[18] D. Q. Nguyen, T. Vu, and A. T. Nguyen, "BERTweet: A pre-trained language model for English Tweets," 2020, arXiv: 2005.10200.