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Improving Documentation Quality and Patient Interaction with AI: A Tool for Transforming Medical Records — An Experience Report

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Abstract

The quality of medical records is paramount for effective patient care, yet it is often compromised by the need for doctors to type information during consultations. This practice not only consumes valuable time that could be better spent on patient interaction but also increases the risk of medical errors due to repetitive copy-pasting. This paper examines the implementation and impact of Voa, an AI-driven tool designed to transform audio from medical consultations into optimized clinical documents. Utilizing automatic transcription technologies like Whisper and generative artificial intelligence, Voa generates accurate and comprehensive medical records from consultation audio. The study, conducted from February to May 2024, assessed Voa's effectiveness through metrics such as the number of anamneses generated, user adoption rates, and activation rates. Results indicate a significant increase in both document generation and user adoption, reflecting growing acceptance and confidence in the platform. The findings highlight Voa's potential to improve documentation quality, reduce medical errors, and enhance doctor-patient interactions, ultimately promoting more human-centered healthcare practices. This experience report underscores the transformative impact of Voa in medical documentation, advocating for broader adoption of such technologies in clinical settings.

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Introduction

The quality of medical records is crucial for effective patient care but is often compromised by the necessity for doctors to type information during consultations. This practice not only consumes valuable time that could be better spent on direct patient interaction, increasing the risk of medical errors and decreasing the overall quality of care, but it is also prone to introducing errors and ambiguities due to the repetitive use of "copy and paste", contributing to a significant rate of medical errors[1].

Voa employs a combination of automatic transcription technologies such as Whisper and generative artificial intelligence to convert audio from medical consultations into optimized clinical documents. The transcription model initially converts speech into text literally, known as ipsis literis, which is then processed by a layer of generative AI. This AI adjusts the text to correct common transcription errors, adapt specific medical terms, and optimize grammar, resulting in the clinical and linguistic accuracy required in medical records.

The possibility to generate documents with Voa using only consultation audio extends beyond anamnesis to include an optimized prescription, a medical certificate, a referral, an examination request, and a clinical summary. The clinical summary is particularly valuable as it translates the consultation into language that is easily understandable for the patient.

In this context, Voa emerges as an innovative solution, employing generative artificial intelligence to transform audio from medical consultations into optimized written records. Voa's technology not only facilitates the creation of accurate and relevant medical records but also promotes a more human-centered doctor-patient interaction. As highlighted in studies, AI can relieve doctors of bureaucratic tasks and allow greater focus on listening to and understanding patients' concerns, optimizing time to prioritize relational aspects of the job[2]. Additionally, electronic medical records have been a source of frustration for many clinicians, associated with lower satisfaction, longer documentation time, and patient safety risks[3].

This approach is similar to innovations seen with the Med-Gemini platform, which has demonstrated how highly capable, multimodal models specialized in medicine can significantly improve clinical reasoning and multimodal understanding in medical contexts[4]. It also underscores the view that artificial intelligence will not replace doctors but will enhance their capabilities to care for patients, allowing them to focus on uniquely human skills such as empathy and persuasion[5]. Those who do not adopt this technology may face professional challenges in the future. Furthermore, studies suggest that AI, when used as an assistant to doctors rather than a substitute, may be more accepted by patients[6].

This study aims to validate a generative AI tool, offered as a Software as a Service (SaaS), which promises to revolutionize how medical records are created, relieving doctors of repetitive and bureaucratic tasks and allowing them to spend more time interacting with patients, as discussed in recent research[7]. The adoption of AI-based solutions, such as Voa, has the potential to minimize recording errors and improve the quality of patient care, freeing doctors to build a more

positive and empathetic relationship with patients, reinforcing the importance of empathy in medicine[8].

Methodology

In this study, the adopted methodology focused on evaluating the implementation of Voa's generative AI tool in a selected set of medical consultations. The analysis period was from February 8 to May 15, 2024, involving doctors who used the platform during their routine consultations in a clinical environment. The system's effectiveness was assessed based on the number of anamneses generated, the number of users, and the activation rate (the number of new users who generated at least one anamnesis within a week).

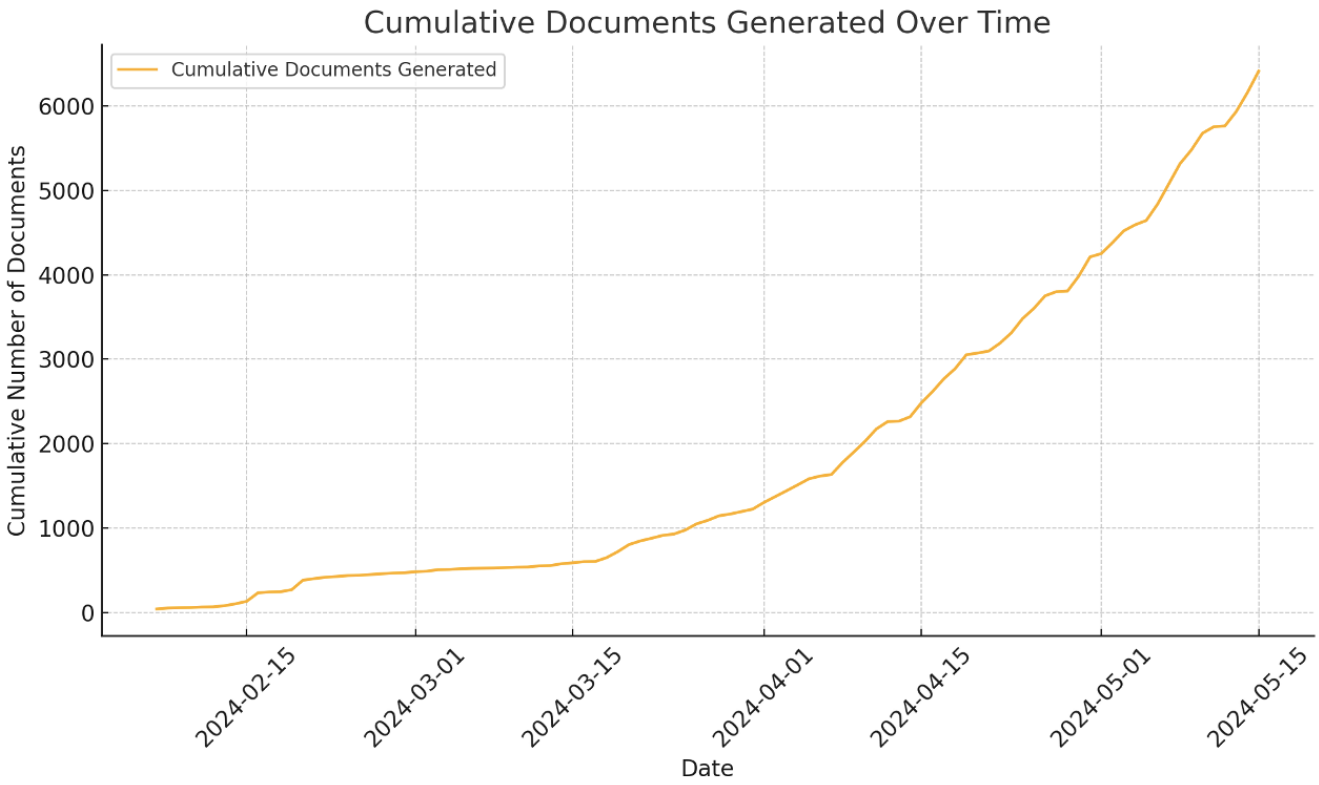
This study did not involve humans directly in a traditional experimental context but rather constituted an analysis based on metrics regarding the tool's use by voluntary doctors who incorporated the system into their routine practices. It is important to note that all collected information was completely anonymized, ensuring no access to patient data or any identifiable information about the individuals involved. Therefore, it was not necessary to obtain approval from a research ethics committee, as the study focused on evaluating the acceptance and effective use of an already implemented technology without compromising data privacy or security.

The number of anamneses generated daily was monitored, allowing continuous tracking of the tool's usage volume. Additionally, doctors' adherence to the technology was measured by the number of new users per day and the cumulative number of users over the period, providing insights into the platform's acceptance. Other important data included the number of documents generated per day and the total accumulated, along with the activation rate, which reflects the percentage of new users who effectively used the system to generate at least one anamnesis.

Although the user feedback collection system is still under development, which limits obtaining a significant number of qualitative evaluations, this limitation does not compromise the ability to objectively measure the technology's impact and acceptance. The absence of a well-established feedback system is seen as an opportunity for future refinements, highlighting the initial and innovative phase of this project in a clinical environment. The available quantitative metrics provide a solid basis for future discussions about the technical capabilities and acceptance of the Voa solution, essential for its broader adoption in the healthcare field.

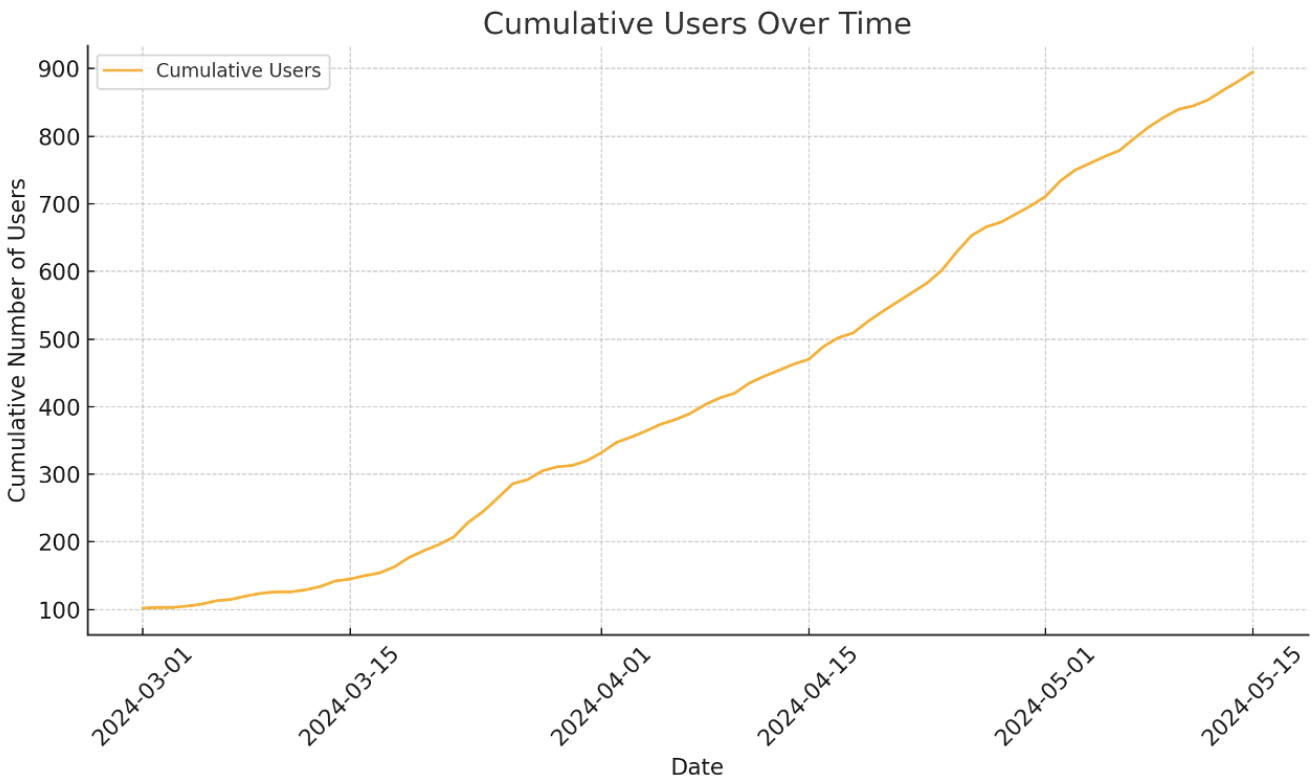
Results

During the analyzed period since the implementation of the Voa platform, a total of 6,380 anamneses were generated, with an accumulated adherence of 891 users.



The graph titled "Cumulative Documents Generated Over Time" shows the cumulative number of documents generated using the Voa platform from the start of its implementation on February 15, 2024, to May 15, 2024. The upward curve demonstrates a consistent and substantial increase in document generation over time, reflecting the growing adoption and efficiency of the platform among physician users.

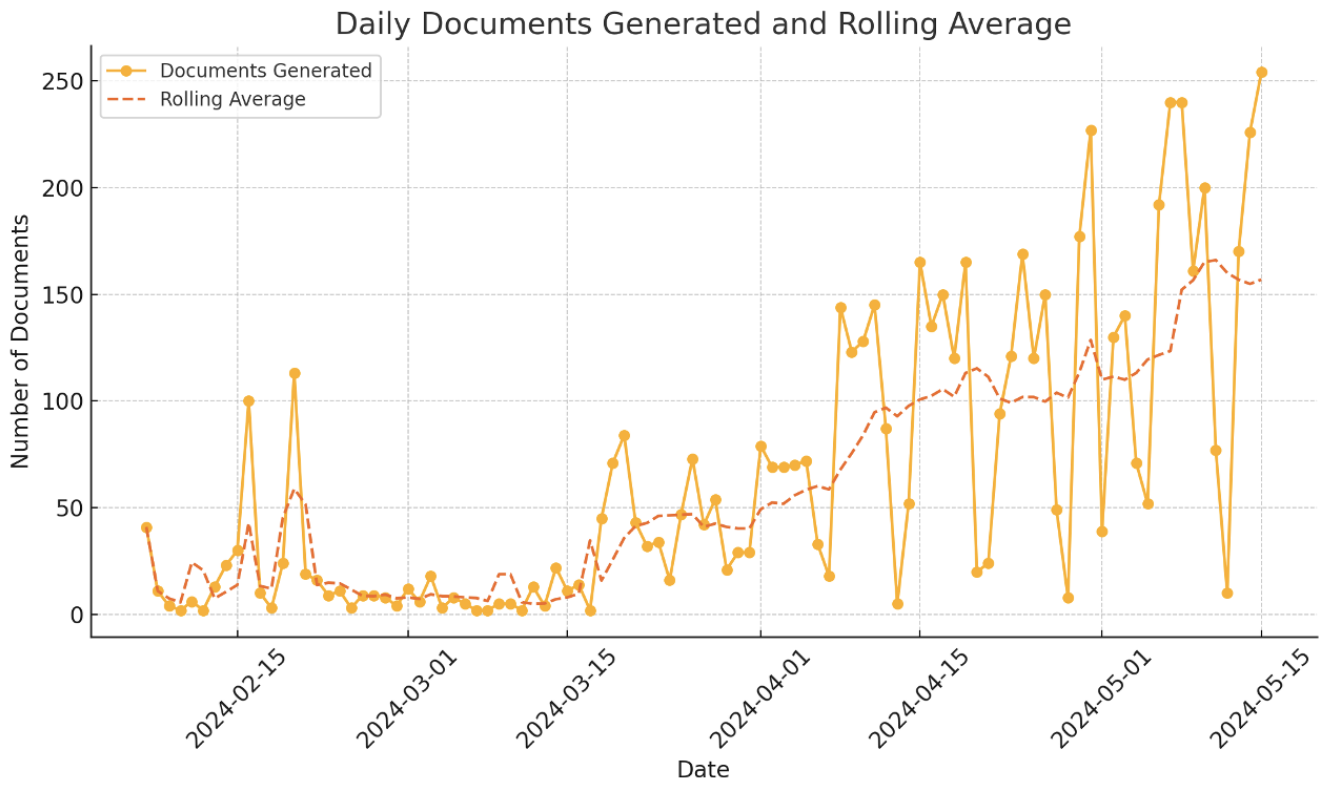
The line begins with relatively slow growth in the first few weeks, followed by a noticeable acceleration starting in mid-March. This pattern suggests an initial phase of learning and adaptation to the system, after which the platform's use becomes more intensive and regular. The most significant increase occurred in April, indicating greater confidence and reliance on the technology for medical record creation. This continuous growth in the volume of documents generated indicates the tool's effectiveness in integrating into clinical routines and assisting in efficient medical documentation.



The graph titled "Cumulative Users Over Time" shows the cumulative number of Voa platform users from the beginning of the study period on March 1, 2024, to May 15, 2024. The curve shows a steady and smooth increase in the number of users over time, indicating growing and continuous acceptance of the platform among healthcare professionals.

The upward trajectory begins with a base of approximately 100 users in early March, growing steadily to nearly 900 users by mid-May. This progressive growth suggests a positive response to the system and effective expansion of the user base. The gradual and consistent increase in the number of users also reflects the effectiveness of dissemination and implementation strategies, suggesting a high retention rate and satisfaction with the platform.

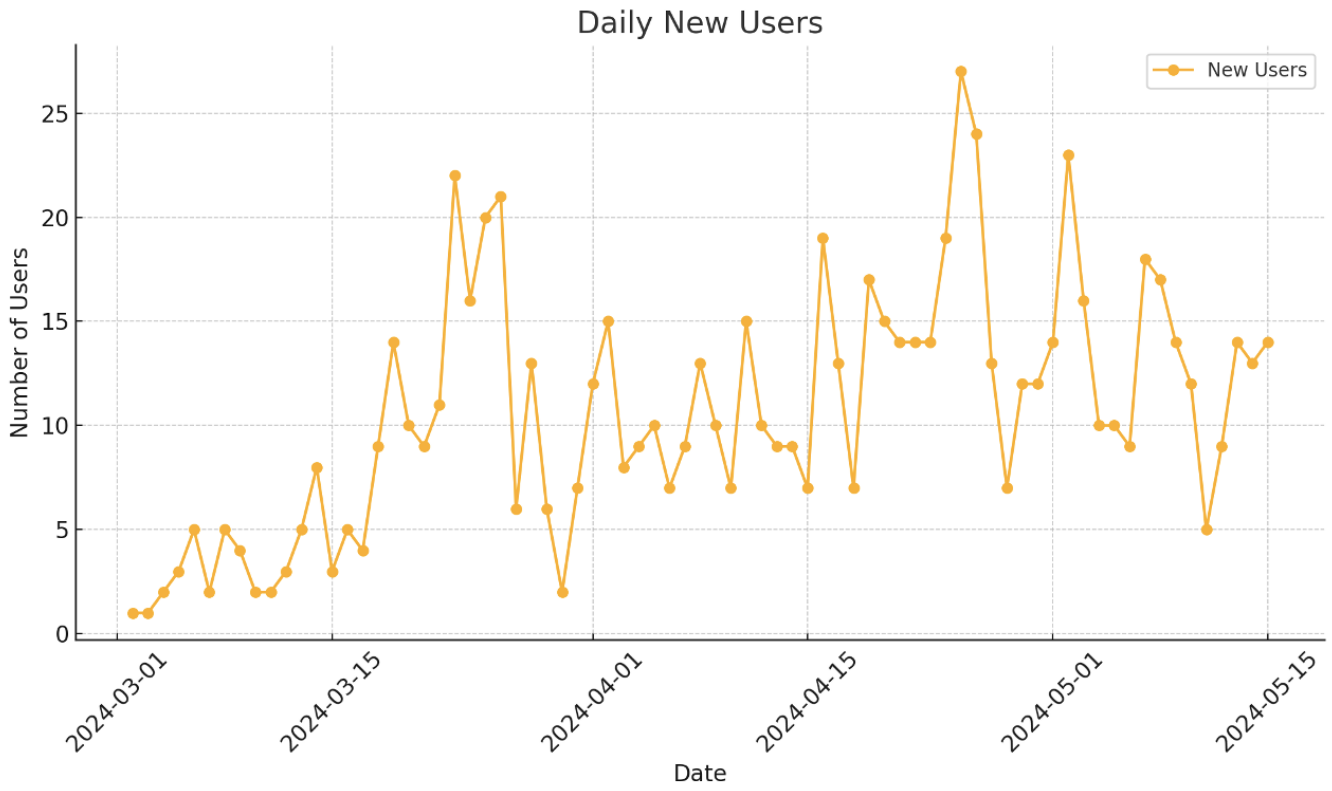
The graph is particularly useful for visualizing the pace of technology adoption and Voa's penetration in the target market. The continuous growth trend also indicates increasing confidence in the platform as a valuable tool for medical record management, highlighting its potential to become an integrated solution in the clinical environment.



The graph titled "Daily Documents Generated and Rolling Average" presents the number of documents generated daily by the Voa platform, along with a rolling average that smooths out daily fluctuations to better visualize trends over time, from February 15, 2024, to May 15, 2024.

The solid yellow line represents the number of documents generated each day, showing considerable variation day-to-day, with peaks exceeding 200 documents. The dashed red line indicates the rolling average of the documents generated, providing a more smoothed view of the fluctuations. The rolling average shows a growth trend over time, indicating progressively higher and more consistent adoption of the platform. This gradual increase in the average suggests not only that more users are utilizing the platform over time, but also that they may be becoming more dependent on its functionalities for creating medical documents.

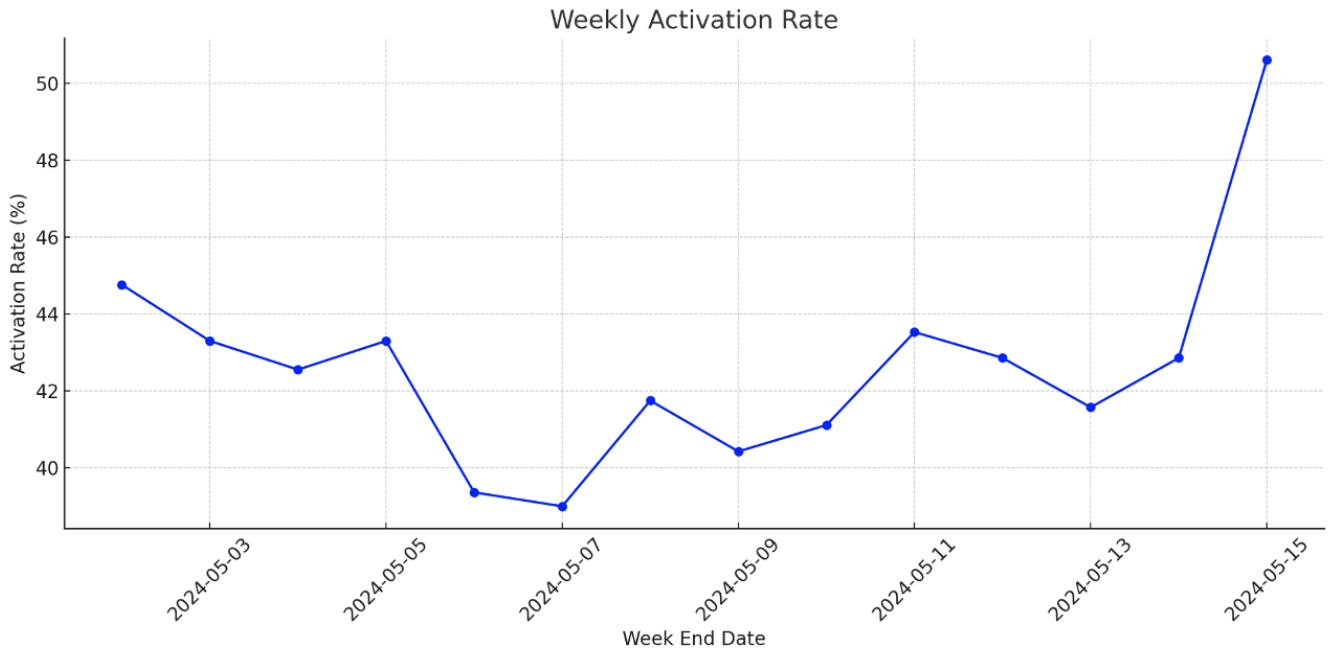
The graph illustrates that despite daily oscillations, the overall trend is growth in platform usage, which can be related to its efficacy and acceptance in the clinical environment. Visualizing these trends is crucial for understanding the real impact of the technology on healthcare professionals' routines and clinical documentation management.



The graph titled "Daily New Users" illustrates the number of new daily users of the Voa platform from March 1 to May 15, 2024. The yellow line represents the number of new users registered each day during this period.

Observing the daily data also indicates a gradual increase in adherence over time, though with some fluctuations. These fluctuations are typical in the launch of new technologies, where user numbers may vary depending on awareness and available learning opportunities. The overall growth, however, suggests that the platform is gaining traction and becoming a more integrated part of daily clinical practices. These variations can be influenced by several factors, such as marketing campaigns and outreach events coinciding with spikes in adoption.

Visualizing this metric is essential to understand how the platform is received in the market and which strategies might be most effective for increasing user engagement over time. These insights can help inform future marketing and training strategies to maximize the adoption and effective use of the technology.



The graph titled "Weekly Activation Rate" shows the weekly activation rate of new users of the Voa platform from March to May 2024. The activation rate is defined as the percentage of new users who registered and generated at least one anamnesis within a week.

The blue line traces the weekly variations in the activation rate, starting at about 45% in early March and showing fluctuations over the subsequent weeks. After a slight decline, the activation rate stabilizes around 41%, with minimal variation for several weeks. An increase is observed in the second half of May, with the activation rate rising to over 50%. This suggests that a higher number of new users began actively using the platform to generate documents.

Variations in the activation rate can be influenced by various factors, including improvements in the user interface, changes in training procedures, or the introduction of new features that may have facilitated or encouraged document generation by new users. The upward trend in the activation rate is a positive indicator of user engagement with the platform, reflecting growing familiarity and confidence in Voa's capabilities. This increase also signals greater effectiveness of implementation and onboarding strategies over time.

Conclusion

This study provided an analysis of the use of Voa's artificial intelligence in clinical settings, focusing on the effectiveness of this tool in transforming medical consultation audio into optimized medical records. The results demonstrate that, during the implementation period from February to May 2024, Voa recorded the generation of 6,380 anamneses, with an accumulated adherence of 891 users. The analysis of the metrics revealed a consistent increase in both the number of documents generated and the number of users, reflecting growing acceptance and confidence in the platform.

The rising activation rate and regular use of the platform demonstrate that doctors are quickly adapting to the functionalities offered by Voa, indicating a successful integration of the technology into daily clinical processes. This is evidenced by the activation rate, which reached nearly 50% in May 2024, suggesting that a significant proportion of new users are engaged and deriving real value from the system.

As Voa continues to evolve, it is expected that its adoption will expand, bringing continuous improvements in operational efficiency and patient care quality. Future iterations of the system should incorporate qualitative feedback for a more in-depth analysis of user satisfaction and the accuracy of medical records, further strengthening the foundation for broader adoption of the solution in clinical settings.

The study reinforces the idea that artificial intelligence is redefining the boundaries of medical practice, making tools like Voa not just aids but essential components in clinical processes. As highlighted, it is increasingly evident that doctors who choose not to integrate these advanced technologies into their practices may find themselves at a significant disadvantage. Reluctance to adopt innovative AI-based solutions may limit doctors' ability to efficiently meet the growing demands of an increasingly complex and data-driven healthcare system. Thus, adopting these technologies may not only be a matter of maintaining competitiveness but a necessity to ensure the provision of high-quality and effective healthcare.

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