Jasmine Meyer

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Summarization of content in healthcare, thanks to the exponential digitalization of medical records, has a wide assortment of modern applications. From tools to condense and clarify patient medical records and history through abstractive summarization like Cotiviti's Medical Record Abstraction services to tools like DeepScribe, which generate doctor's notes in real-time, the use of large language models (LLM) for natural language processing (NLP) of records has alleviated medical providers' workloads by reducing manpower and man-hours needed prior to and during patient interaction (Ariwala).

Relevant Trends

Medical academia will likely become increasingly affected by the development of this technology, with many medical educators and academic administrators looking towards the future of LLMs as a tool to refining and expediting quality medical treatment from its root: our doctors- and nurses-in-training (Abd-Alrazaq, et al).

Another pertinent focus in this healthcare technology's development is that of immediacy: delivering results as quickly as possible, as accurately as possible. (This is one of DeepScribe's main selling features. 'Real-Time', unveiled at the HIMSS conference this year, enables instantaneous notes, live feedback, and optimized handoffs between physician and assistants)

(PR DeepScribe). Microsoft’s Nuance's Dragon Ambient eXperience (DAX) Express, now known as DAX Copilot, has also been gaining traction for the past year for similar deliverables. Authors at the Harvard Business Review estimate $18 billion saved annually thanks to ambient clinical documentation technology, as these AIs are now known (Kalis et al.).

Additionally, LLMs like ChatGPT have become a more and more frequented source of information on casual medical inquiries since 2019, when COVID sent healthcare reeling and sent the middle-class consumer from the office to the home, as compared to Google or other previously popular websites (Shahsavar et al.). Doctors have vocalized concerns on the efficacy and safety of LLMs regarding real-world medical diagnoses (Tamayo-Sarver), though this is far from the first technology-based self-diagnosis tool to demonstrate problems with accuracy and safe use. Social media (McVay) as a tool for mental health self-diagnosis and search engines (Kwakernaak et al.) as a tool for general self-diagnosis have both proven to be equally problematic (Wheeler), but this has seemingly never deterred the popularization of online self-diagnosis.

Associated Opportunities and Threats

As demonstrated in practice, these summarization techniques implementing LLMs and NLP have and will continue to save healthcare time, money, manpower, and error (IBM Education). Cotiviti therefore stands to gain from investing into client privacy and data security' innovation. The more prevalent LLMs and AI-driven healthcare tools become, the more at-risk personal data will become. By preparing for a future in which data leaks could potentially compromise Cotiviti's brand as a reliable provider of healthcare management tools, lawsuits and dangerous consequences can be prevented all while holding clients' patients' well-being in mind.

Data summarization also has the long-term potential to revolutionize the way healthcare providers synergize with their team members in the workplace, but continued and past innovation in hardware and software prevents modern technology from being accessible to all providers universally and is an obstacle to optimized teamwork. To alleviate this problem and make their technology solutions more prevalent and accessible, communication with healthcare policymakers in national and state-level legislatures to standardize healthcare technologies and systems could present a unique opportunity for Cotiviti to upgrade healthcare for everyone involved while expanding and reinforcing their own user base.

The aging national population is another danger to the American healthcare system. As people receive access to better healthcare and information, they'll live longer, but the longer they live, the greater their risks for health complications become (Duquesne School of Nursing). This will continue to tax the healthcare labor supply, which is predicted to massively decline by 2036-likely in conjunction with a massive rise in overwork and burnout for the remaining workforce.

Moving Forward

Though addressing data security and hardware modernization/standardization will have significant long-term results, the matter of alleviating the worsening healthcare labor shortage can be undertaken in a much more contemporary time frame, with a more tangible and immediate impact on the healthcare industry.

With technology-supported self-perpetuated health records, the use of LLMs and AI can be extended to further healthcare outside of the examination room and into the home. Many scientists postulate that self-monitoring and "mindfulness" practices have great potential to ease the workload on healthcare professionals (Epstein et al.), and Kota Kubo, the co-founder and

co-CEO of Ubie (a HealthTech startup and symptom checker with more than 10 million users) reports that long periods of time between patient check-ins can "quickly snowball into poorer health outcomes", citing research revealing that a majority of patients forget physician advice and treatments without external provocation (Knowles).

An accessible and user-friendly virtual health interface can be applied to remedy this problem: after receiving input, for example, verbal, handwritten, or typed, an LLM can condense a patient's conveyed health experiences daily into a summary easily referenced by a doctor or the patient themselves. To identify health issues earlier on, the LLM can also be trained on symptom databases to collect relevant data from conversational exchanges with users, helping doctors more readily identify potential symptom correlations. The mediating role of the AI in this exchange not only simplifies the doctor's preliminary work before developing diagnoses and conclusions, but also increases potential accuracy and provides patients with an easily-digestible and chronological timeline of their health. Such a healthcare assistant could also remind patients periodically to perform their recommended physical therapy, take medications, and even practice better mental and emotional regulation practices.

Pursuing the innovation of this kind of health interface is about more than just patient well-being and reducing health provider burnout. In the words of a respiratory therapist from Nevada, “The primary concern for [medical provider] burnout is not being able to emotionally take care of each patient individually or uniquely" (U.S. Dept. of Health). Therefore, by lowering health providers' workloads to and keeping them at a manageable level, we save the future of healthcare.

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