AUTOMATIC SPEECH RECOGNITION AS A MANAGEMENT TOOL FOR REDUCING COPY-AND-PASTE DEPENDENCE IN ELECTRONIC HEALTH RECORDS: EVIDENCE FROM UZBEKISTAN

Teshayev Rajabbek Kaxramonovich
PhD Candidate in Management, Westminster International University in Tashkent
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Abstract. *This article examines the copy-and-paste problem in Electronic Health Records (EHRs) and argues that Automatic Speech Recognition (ASR) can reduce clinicians' dependence on copied text by changing the practical conditions under which clinical documentation is produced. The paper is based on the author's PhD research in Uzbekistan, where a mixed-methods, within-subject quasi-experimental field design was used to evaluate voice-to-text documentation in real healthcare settings. The study was conducted in Family Polyclinic No. 8 of the Bukhara City Medical Association and the Republican Specialized Cardiology Scientific-Practical Medical Center. Although the dissertation investigated several outcomes, the present article deliberately focuses only on one management and documentation-quality issue: the tendency of clinicians to reuse previous EHR text instead of creating original, patient-specific notes. The dissertation reported that 95 percent of doctors acknowledged copying and pasting text from earlier records, mainly because manual EHR entry was perceived as burdensome. After exposure to ASR-supported documentation, the tendency to rely on copy-and-paste declined by 7.5 percent. This finding is interpreted through Human-Computer Interaction, Cognitive Load Theory and behavioural economics. The article argues that ASR does not reduce copy-paste dependence through surveillance or punishment; rather, it reduces the effort required to create fresh documentation, thereby weakening the behavioural incentive to recycle old text. International literature shows that uncontrolled copy-and-paste may propagate outdated information, obscure authorship, inflate note length and weaken trust in the medical record. The Uzbek evidence contributes to this literature by demonstrating the relevance of ASR in a multilingual and still-developing digital-health environment. The paper concludes with practical recommendations for hospital managers and policymakers, including ASR training, copy-paste governance, provenance tracking, specialty-specific vocabulary development and periodic documentation audits.*

Keywords: *automatic speech recognition, electronic health records, copy-and-paste, clinical documentation, healthcare management*

1. Introduction

Electronic Health Records (EHRs) are introduced in healthcare systems to improve continuity of care, standardize documentation and make clinical information available across institutional boundaries. However, the transition from paper-based records to electronic documentation has also created new managerial and behavioural problems. One of the most persistent problems is the extensive use of copy-and-paste, also called copy-forward or cloned documentation. In principle, copying a previous note may appear useful because it helps clinicians avoid rewriting repetitive

information. In practice, however, poorly controlled copying may transfer outdated or irrelevant content into new encounters and may make it difficult to determine what was actually observed, assessed and decided during the current consultation.

The copy-and-paste problem is especially important in health systems that are still digitalizing and where clinicians are not yet fully comfortable with EHR interfaces. In such settings, copy-and-paste should not be understood only as individual misconduct. It is often a rational response to an interface that is experienced as slow, tiring or inconsistent with clinical workflow. When clinicians are required to produce electronic notes but do not have enough training, time or confidence in the software, copying from previous records becomes an attractive shortcut. This shortcut may reduce immediate effort, but it also shifts risk to future users of the record, who may struggle to distinguish current clinical evidence from repeated historical text.

My PhD research was motivated by this practical management problem in Uzbekistan. The dissertation studied how voice-to-text Automatic Speech Recognition (ASR) can support healthcare digitalization and improve the use of EHRs. Although the broader dissertation also examined other documentation outcomes, this article focuses exclusively on copy-and-paste dependence. The reason for isolating this topic is that copy-and-paste directly links human behaviour, interface design and documentation governance. A health manager who wants to improve EHR quality cannot only ask whether doctors use a digital system; the manager must also ask how they use it and whether the system encourages original documentation or mechanical reuse.

The empirical foundation of this article is the dissertation's field evidence from Uzbek clinical settings. Before ASR was tested, 95 percent of surveyed doctors reported that they normally copied and pasted from existing EHRs because they wanted to reduce the burden of manual typing. After doctors were introduced to ASR-supported documentation, the tendency to rely on copy-and-paste decreased by 7.5 percent. This result is modest in absolute terms, but it is theoretically and practically meaningful because it shows that documentation behaviour can change when the interaction between clinician and EHR is redesigned.

The research question of this article is therefore: how can ASR reduce clinicians' dependence on copy-and-paste in EHR documentation? The central argument is that ASR reduces copy-and-paste not by imposing stricter control, but by making original note generation less burdensome. When clinicians can dictate encounter-specific information, the operational need to recycle previous text declines. This interpretation allows ASR to be viewed not simply as a technical tool, but as a management instrument for supporting documentation integrity.

2. Literature Review

2.1. Copy-and-paste as a documentation-governance problem

The international literature on EHR copy-and-paste shows that the practice is widespread and difficult to eliminate. Tsou et al. (2017) conducted a systematic review and proposed safe-practice recommendations for copy-and-paste use in EHRs. Their recommendations included making copied material visible, preserving the provenance of copied text, training clinicians in appropriate use and auditing copy-and-paste behaviour. These recommendations are important because they define copying as a governance issue. Copying is not inherently unsafe in every situation, but unmanaged copying can undermine record reliability.

AHIMA (2014) similarly warned that copy-and-paste functionality can affect the integrity of the legal health record when reused content is not reviewed and updated. The risk is not merely that

the record becomes longer. The deeper problem is that a copied note may contain information that is clinically plausible but no longer true. Such text can be more dangerous than a blank field because it creates the appearance of documentation while concealing the absence of fresh clinical assessment. Bell et al. (2020) also showed that patients can identify errors in ambulatory care notes, reinforcing the idea that documentation quality is not an abstract administrative concern but an issue that can affect trust and care continuity.

Copy-and-paste also contributes to what is often called note bloat. Long notes filled with repeated material increase the cognitive burden on the next clinician who must read them. The reader may spend more effort separating new findings from repeated history than interpreting the patient's current condition. This is a management problem because it affects communication across departments, accountability and the practical usefulness of the EHR as a shared information resource. If the EHR becomes a warehouse of repeated text, its value as a clinical management tool declines.

2.2. Why clinicians copy and paste

A narrow explanation of copy-and-paste would treat the practice as laziness or lack of professional discipline. This explanation is incomplete. Studies of EHR use show that documentation work competes with direct clinical attention, decision-making and patient communication (Sinsky et al., 2016; Young et al., 2018). In this environment, clinicians adopt shortcuts that help them complete required documentation under pressure. Copy-and-paste is therefore a behavioural response to workload, interface friction and the repetitive structure of many medical notes.

In Uzbekistan, the dissertation found that this behavioural mechanism was particularly visible. Doctors reported reluctance to type, limited confidence with computer interfaces and a preference for editing previous templates rather than composing new records from the beginning. The reported baseline level of copy-and-paste dependence was very high: 95 percent of doctors acknowledged copying and pasting from existing EHRs. This finding should be interpreted in context. EHR implementation in Uzbekistan remains uneven, and many clinicians continue to work in hybrid environments where paper and electronic documentation coexist. Under such conditions, the same information may have to be recorded more than once, which strengthens the perceived need for shortcuts.

Behavioural economics helps to explain this pattern. When two options are available, users tend to choose the option that requires less immediate effort, especially under time pressure and cognitive load. If typing a complete note requires high effort while copying a previous note requires low effort, the interface indirectly rewards copying. A documentation policy that simply forbids copy-and-paste may not succeed if the underlying workflow still makes copying the easiest option. A more sustainable strategy is to reduce the effort cost of producing original documentation.

2.3. ASR as an alternative documentation interface

ASR offers a different path because it changes the mode of interaction between the clinician and the record. Instead of relying mainly on keyboard entry, the clinician can dictate the narrative elements of the consultation. Kumah-Crystal et al. (2018) reviewed voice-based EHR interaction and showed that speech technologies have been used for documentation, commands and clinical navigation. Blackley et al. (2020) compared speech recognition and typing in clinical documentation and found that voice-generated notes can differ in composition and linguistic richness. For the purpose of this article, the most important implication is behavioural: voice input can make it easier for clinicians to produce encounter-specific text rather than reuse previous wording.

ASR should not be presented as a perfect solution. Recognition accuracy may be affected by background noise, accents, medical terminology and the absence of well-developed language resources. These constraints are especially relevant for Uzbek-language clinical documentation, where medical ASR resources remain less mature than in English. Nevertheless, a technology does not have to be perfect to be managerially useful. It must be good enough to change behaviour in a desired direction. If ASR reduces the perceived difficulty of generating fresh documentation, it can weaken reliance on copying even if clinicians still need to review and correct dictated text.

The conceptual contribution of this article is to position ASR as a behavioural intervention. It is not only a transcription tool. It is a redesign of the documentation environment. In Human-Computer Interaction terms, ASR provides a more natural input channel. In Cognitive Load Theory terms, it can reduce the mental and mechanical effort associated with manual note composition. In behavioural economics terms, it changes the relative attractiveness of original writing versus copy-forward behaviour.

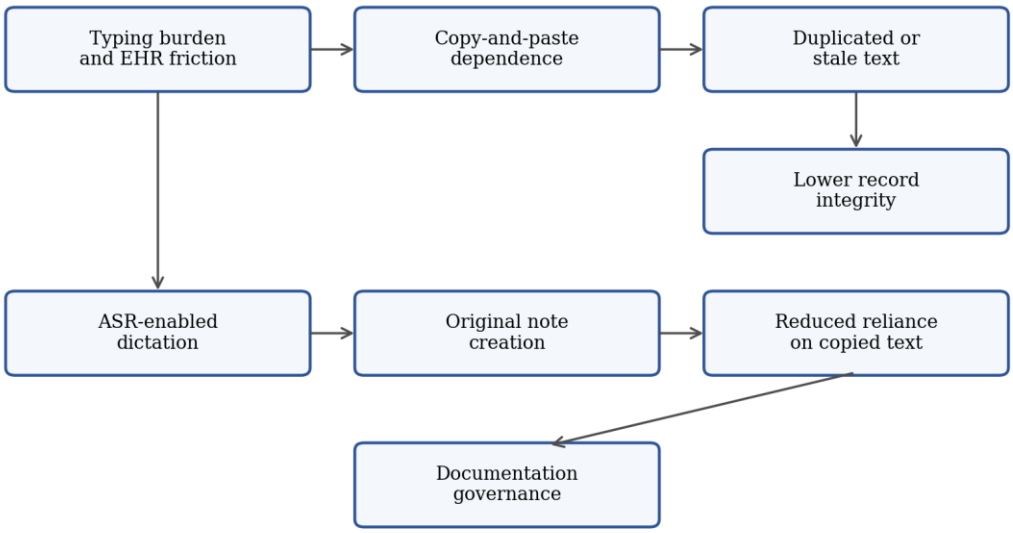


Figure 1. Conceptual mechanism linking ASR to reduced copy-and-paste dependence.

3. Methods

Table 1. Design characteristics of the study used for this article

Element	Description
Study design	Mixed-methods, within-subject quasi-experimental field design
Country context	Uzbekistan
Clinical settings	Bukhara family polyclinic and specialized cardiology center
Participants	120 doctors
Intervention	ASR-supported voice-to-text EHR entry
Comparator	Conventional EHR entry and reuse of prior records
Focal outcome	Copy-and-paste dependence in EHR documentation
Theoretical lenses	HCI, Cognitive Load Theory and behavioural economics

This article is derived from the author's PhD dissertation on improving healthcare management tools in Uzbekistan through digital documentation and ASR. The dissertation used a mixed-methods, within-subject quasi-experimental field design. The within-subject logic was appropriate because the same participating doctors could be observed under different documentation conditions, reducing the influence of individual differences in habits, typing skill and clinical style. Full randomization was not feasible in real hospital environments, so the research adopted a practical quasi-experimental design.

The empirical work was conducted in two Uzbek medical settings: Family Polyclinic No. 8 of the Bukhara City Medical Association and the Republican Specialized Cardiology Scientific-Practical Medical Center. These institutions were relevant because they represent real clinical environments where documentation practices are shaped by organizational routines, patient flow and existing digitalization challenges. The study involved 120 doctors and compared their documentation practices before and after exposure to ASR-supported EHR entry.

For this article, the focal outcome is copy-and-paste tendency. Other dissertation outcomes are intentionally excluded from the analysis to maintain conceptual focus. The pre-ASR measure was obtained through questionnaires and observations concerning whether clinicians relied on existing EHR templates and previous notes. The post-ASR measure examined whether doctors, after receiving access to ASR tools and basic support, would continue to prefer copying and editing previous records or would instead use dictation to create fresh text. The analysis is descriptive and interpretive, supported by the theoretical frameworks discussed above.

The methodological position of the article is transparent. The copy-and-paste measure is primarily behavioural and self-reported, although it was collected within a practical implementation environment rather than as a detached opinion survey. The finding should therefore be read as evidence of change in stated and observed documentation preference, not as a complete automated audit of all copied text strings inside an EHR database. This limitation is important, but it does not eliminate the value of the evidence. In many healthcare settings, documentation behaviour is shaped by attitudes, perceived effort and practical convenience; measuring clinicians' declared willingness to abandon copy-and-paste after ASR exposure is therefore relevant for implementation management.

4. Results

Table 2. Copy-and-paste tendency before and after ASR exposure

Measure	Before ASR	After ASR exposure	Interpretation
Copy-and-paste use	95%	Lower than baseline	Widespread before ASR
Reported change	Baseline	7.5% decrease	Reduced reliance on copied text
Behavioural direction	High dependence	Reduced dependence	Shift toward dictated original notes

The dissertation revealed that copy-and-paste was deeply embedded in routine EHR practice before ASR exposure. Before testing the ASR-supported workflow, 95 percent of doctors reported that they normally copied and pasted existing EHR text to reduce the burden of electronic documentation. Only a small minority reported that they did not rely on ready templates. Doctors explained this behaviour by referring to reluctance to type, limited computer confidence, complex

medical terminology and the perception that many patient cases were similar enough to justify reusing previous text.

After doctors were introduced to ASR and given assistance in using voice-to-text entry for the text-heavy parts of the EHR, more participants indicated that they would prefer dictation instead of copying and pasting existing records. The dissertation reports that the tendency to copy and paste decreased by 7.5 percent. This result does not mean that ASR eliminated copying. On the contrary, the study shows that copy-and-paste remained a strong habit. However, the decline is important because it demonstrates that a change in the documentation interface can produce a measurable change in clinician behaviour.

The result is best interpreted as an early-stage implementation effect. In an environment where copying was almost universal at baseline, a moderate reduction after limited exposure to ASR is a meaningful signal. It suggests that clinicians are not permanently attached to copying as a preferred professional practice; rather, they use it because the alternative is inconvenient. When the alternative becomes easier through dictation, some clinicians are willing to move toward original documentation.

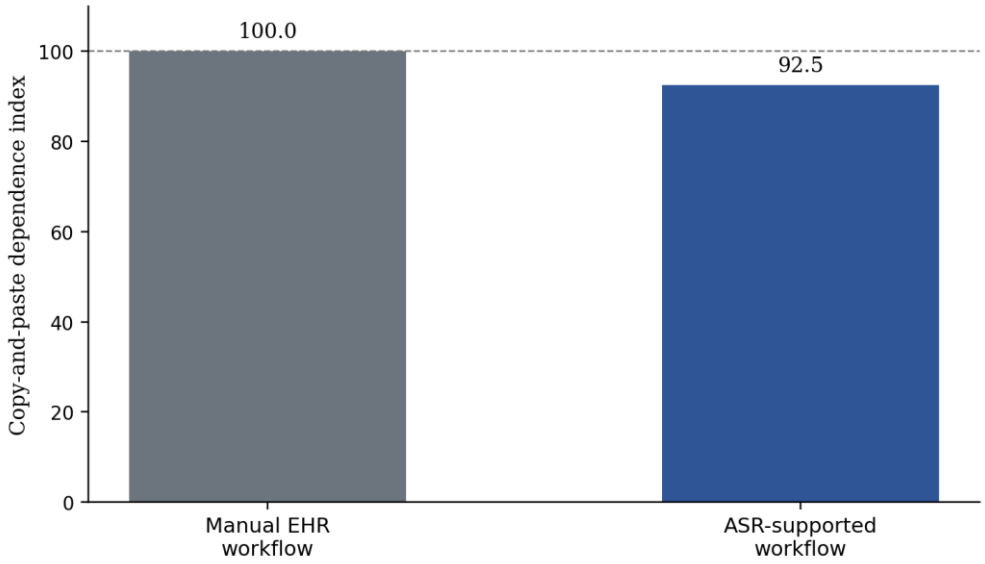


Figure 2. Relative copy-and-paste dependence before and after ASR exposure.

5. Discussion

5.1. Interpretation of the Uzbek evidence

The main finding of this article is that ASR can reduce clinicians' dependence on copy-and-paste by lowering the burden of original documentation. This interpretation is consistent with the dissertation's theoretical foundation. From an HCI perspective, the problem is not only that clinicians make inappropriate choices; it is also that the interface structure makes some choices easier than others. If the system requires extensive typing, navigation and repeated data entry, clinicians will naturally look for ways to reduce effort. Copy-and-paste is one such adaptation. ASR changes the interaction by allowing the clinician to speak the note, which is closer to the natural process of clinical reasoning and verbal explanation.

From a Cognitive Load Theory perspective, the copied note can be seen as an attempt to reduce mental workload. The doctor does not have to organize every sentence from the beginning, but can edit a previous structure. The danger is that editing may be superficial. Old statements may remain in the record even when they no longer reflect the patient's current condition. ASR offers a

different way to reduce cognitive burden: instead of reducing effort by reusing old text, it reduces effort by simplifying the production of new text. This distinction is central. The goal is not to make documentation harder in the name of quality; it is to make high-quality documentation easier.

From a behavioural economics perspective, the intervention changes incentives. Under manual entry, copying may be the path of least resistance. Under ASR, speaking a patient-specific narrative becomes more practical. The decline of 7.5 percent in copy-and-paste tendency should therefore be viewed as evidence that some doctors respond to a changed choice architecture. The interface can nudge users away from unsafe reuse when it makes the preferred behaviour less costly.

5.2. Why the finding matters for EHR management

The finding matters because copy-and-paste is not only a clinical documentation issue; it is a management issue. Healthcare managers are responsible for ensuring that the EHR functions as a reliable organizational memory. If the record is filled with duplicated, outdated or poorly attributed content, it becomes less useful for care coordination, audit, quality improvement and legal accountability. A record that is long but repetitive may create the illusion of completeness while reducing the practical visibility of new clinical information.

The Uzbek evidence also matters because much of the international literature comes from highly digitized healthcare systems. In contrast, Uzbekistan represents a health system where digitalization is ongoing and where language resources for ASR are still developing. This makes the case more relevant for other middle-income or multilingual settings. It suggests that voice technologies should not be considered only after a health system has achieved mature EHR adoption. They may be useful during the transition itself because they address one of the behaviours that weakens early EHR quality: dependence on copied templates.

At the same time, ASR should not be used as an excuse to ignore documentation governance. The technology reduces the incentive to copy, but it cannot replace policy, training or audit. A hospital could install ASR and still have poor documentation if clinicians are not trained, if copied text is not traceable, or if no one reviews the quality of notes. The best interpretation of the study is therefore integrative: ASR is a practical component of a broader documentation-quality strategy.

5.3. Practical recommendations

First, hospitals should develop explicit copy-and-paste policies. Such policies should distinguish between legitimate reuse of stable information and unsafe duplication of clinical assessment. The policy should require copied content to be reviewed and updated, and it should clarify authorship responsibility. A policy alone is not sufficient, but it creates the organizational standard against which practice can be evaluated.

Second, ASR should be implemented in the text-heavy parts of the clinical note where original narrative is most valuable. These include history of present illness, assessment, plan and explanations of clinical reasoning. Highly sensitive structured fields, such as medication dose or patient identifiers, may still require controlled entry and verification. A hybrid model is therefore more appropriate for Uzbekistan than full reliance on ASR. Dictation can support original narrative, while structured fields can preserve precision.

Third, ASR training should explicitly address copy-and-paste behaviour. Training should not only teach doctors how to activate a microphone. It should explain why original documentation matters, how copied text can create risk, and how dictation can be used to produce patient-specific

notes. The training should include examples of unsafe cloned notes and examples of concise dictated notes that better reflect the current encounter.

Fourth, hospital managers should monitor documentation behaviour after implementation. The key management question is not simply how many doctors have access to ASR, but whether dependence on copied text is decreasing. EHR systems should ideally include functions that detect repeated text, flag copied blocks and preserve provenance. Periodic audits can identify departments or note types where copying remains unusually high.

Fifth, national digital-health policy should support Uzbek-language medical ASR development. Copy-paste dependence will be difficult to reduce if ASR tools do not recognize local pronunciation, clinical vocabulary and mixed Uzbek-Russian medical terminology. Investment in speech corpora, specialty vocabularies and continuous model improvement is therefore a documentation-quality intervention, not only an information-technology project.

6. Limitations and Future Research

The study has several limitations. First, the design was quasi-experimental rather than randomized, which is appropriate for real hospital settings but limits causal certainty. Second, the copy-and-paste outcome was partly based on doctors' self-reported behaviour and preferences. Future research should supplement questionnaires with automated text-similarity analysis of EHR entries, system log data and provenance metadata. Third, the study was conducted in two medical institutions, and the results may not represent all regions, specialties or levels of care in Uzbekistan.

Future research should examine whether the reduction in copy-and-paste dependence persists after longer ASR use. Short-term exposure may produce curiosity, while long-term adoption depends on reliability, trust and integration with normal workflow. Studies should also compare departments because copy-paste behaviour may differ between primary care, cardiology, oncology, emergency care and inpatient medicine. Finally, future work should test governance packages that combine ASR with training, copy-detection tools and periodic audits. The most important question is not whether ASR works in isolation, but how it can be managed as part of a sustainable documentation-quality system.

7. Conclusion

The copy-and-paste problem in EHRs is a serious challenge for healthcare management because it affects the credibility, traceability and clinical usefulness of medical records. In the Uzbek settings examined in my PhD research, the problem was strongly connected to the burden of manual electronic documentation. Before ASR exposure, 95 percent of doctors reported copying and pasting from existing records. After exposure to ASR-supported documentation, the tendency to rely on copying decreased by 7.5 percent.

This article argues that the result is important because it shows how documentation behaviour can be changed through interface redesign. ASR does not solve the copy-and-paste problem by forbidding copying. It reduces the need for copying by making original documentation easier. For healthcare managers, this finding suggests that documentation governance should combine rules with better tools. Policies, training and audits remain necessary, but they should be supported by technologies that make patient-specific documentation practical for clinicians.

For Uzbekistan and other multilingual health systems, ASR should therefore be viewed as more than a convenience. It is a potential management tool for improving the integrity of EHR documentation. Its successful adoption will require language-specific development, training, hybrid

documentation design and continuous monitoring. If these conditions are met, ASR can help transform EHRs from repositories of repeated text into more trustworthy records of current clinical care.

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