# Unraveling the Sociotechnical Roots of Inefficiency in Prior Authorization

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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## Introduction

A 47-year-old mother of three presents with basal cell carcinoma on her nasal bridge. After years of treatment, her surgeon is ready to complete a necessary procedure. However, a prior authorization (PA) requirement from the patient's insurance company abruptly halts the process. The surgeon faces an impossible choice: send the patient home, risking tumor growth and potential disfigurement, or proceed without authorization and risk non-payment, legal implications, and potential disciplinary action. This scenario illustrates the profound human costs of an inefficient PA system that delays critical care (Hruza, 2020). In fact, a study by the American Medical Association found that 28% of physicians reported that PA delays have led to serious adverse events for their patients (Robeznieks, 2019). While PA aims to manage healthcare costs and ensure appropriate treatment, the current manual process is time-consuming, error-prone, and often detrimental to patient outcomes. In many cases, PA requirements can delay treatment by weeks or even months, during which time a patient's condition may significantly worsen.

This research examines the sociotechnical roots of inefficiency in PA, exploring the question: How do organizational tensions, misaligned incentives, and technological inadequacies between healthcare providers and payers contribute to an ineffective PA system, and what strategies could foster greater trust, collaboration, and efficiency? The analysis applies actor network theory (ANT) to map the complex relationships between human and non-human actors in the PA ecosystem, aiming to identify leverage points for systemic change. By utilizing ANT, this study seeks to uncover the web of interactions shaping the PA process, examining how various actors—including healthcare providers, payers, patients, and technologies—mutually influence each other. The significance of this research extends beyond academia. As healthcare

costs rise and patient satisfaction declines, understanding and addressing the inefficiencies in the PA process becomes crucial for improving healthcare quality and accessibility.

## Methods

This paper uses multiple approaches, combining documentary research and discourse analysis to examine the sociotechnical roots of inefficiency in PA processes. The documentary research component involves a thorough review of scholarly literature, including peer-reviewed journal articles, books, and reports in the fields of healthcare administration, health informatics, and science and technology studies. Sources are identified through academic databases such as PubMed, Web of Science, and Google Scholar, using keywords related to prior authorization, healthcare technology, and sociotechnical systems. This review aims to synthesize current academic understanding of PA processes and their challenges. Complementing this, the discourse analysis focuses on public discussions and representations of PA in various media platforms. This includes analyzing content from social media platforms (Twitter, LinkedIn), video-sharing sites (YouTube), and healthcare-focused online forums. The analysis examines how different stakeholders (healthcare providers, patients, insurers, and policymakers) discuss and frame PA issues. This approach allows for the capture of real-world perspectives and experiences that may not be fully represented in academic literature. Data from both methods will be analyzed using guidance from the theoretical frameworks of technological determinism and actor-network theory. This analysis will identify key themes, patterns, and contradictions in how PA processes are understood and experienced by various actors in the healthcare system. By combining data from scholarly sources and public discourse, this study aims to provide a comprehensive understanding of the sociotechnical landscape of PA.

## Background

PA is a requirement instituted by health insurance companies that mandates healthcare providers to obtain approval before providing certain medical services, medications, or treatments to patients. The PA process typically involves multiple complex steps: submission of detailed patient information and medical necessity documentation, review by the payer's medical staff or automated systems, and often multiple rounds of communication between providers and payers to reach a decision. While intended as a cost-control measure, PA has become a significant source of frustration, inefficiency, and potential harm in the healthcare system. The evolution of PA can be traced back to the 1960s, when it was initially introduced as a utilization management tool for inpatient care. Over the decades, its use has expanded to cover a wide range of medical services, procedures, and prescription drugs. The manual nature of many PA processes creates a substantial administrative burden for healthcare providers. A 2018 American Medical Association survey found that 92% of physicians felt PA negatively impacts patient care (Hruza, 2020). Providers often need to navigate multiple payer systems, each with its own set of rules and requirements. They must fill out extensive forms, gather supporting evidence from various sources (e.g., medical records, lab results, imaging studies), and engage in time-consuming appeals processes when initial requests are denied (Berg, 2023). A study by Casalino et al. (2009) found that physicians spend an average of 3 hours per week interacting with health plans, with a significant portion of this time dedicated to PA-related tasks. This administrative workload not only takes time away from direct patient care but also contributes to provider burnout.

The complexity of the PA process extends beyond just paperwork and affects all parties involved. It often requires healthcare providers to dedicate significant staff resources, such as independent staff members or entire departments, to managing PA requests and follow-ups,

leading to increased operational costs. Moreover, a lack of guideline standardization across different payers means that providers must be familiar with multiple sets of rules, increasing the likelihood of errors or delays. Like providers, payers must also allocate substantial resources to reviewing and processing PA requests, often employing teams of nurses, physicians, and administrative staff to manage the workload. For patients, PA requirements can result in dangerous delays in receiving necessary treatments. When authorizations are denied or delayed, patients may experience worsening health conditions, increased pain and suffering, and escalated out-of-pocket expenses. As such, the complexity of the PA process places a significant burden on patients to advocate for themselves in a system that is often opaque and difficult to navigate.

The misalignment of incentives between providers and payers exacerbates inefficiencies in the PA system. Providers strive to deliver comprehensive care they deem best for patient outcomes, while payers aim to control costs by ensuring treatments meet strict medical necessity criteria. This tension creates an atmosphere where providers may feel that payer policies restrict their ability to offer optimal care. The lack of trust between providers and payers has significant consequences for the healthcare system as a whole. Beveridge et al. (2016) found that 41% of physicians not in value-based payment arrangements cite distrust of insurers as their biggest obstacle to adoption. This mistrust leads to providers and payers working in silos rather than collaborating to improve patient outcomes and reduce costs. Furthermore, payers lack visibility into provider decision-making rationales, leading to potential mistrust and adversarial relationships (Joseph, 2023). This lack of transparency can result in unnecessary denials or requests for additional information, further prolonging the authorization process and potentially compromising patient care.

Current technologies used to facilitate communication in the PA process, including electronic health records (EHRs), fax machines, emails, and insurance submission portals, often fall short in supporting real-time, transparent communication. For instance, while EHRs contain vast amounts of patient data, they often cannot easily extract and format the specific information required for PA requests. This technological gap further entrenches inefficiencies and disallows the adoption of potentially transformative solutions like artificial intelligence-enabled PA automation (Kyle & Song, 2023). The lack of interoperability, caused by unstandardized data formats and communication protocols, between different systems used by providers and payers create additional barriers to streamlined communication and decision-making. For example, a provider's EHR system may not be able to directly communicate with a payer's PA portal, necessitating manual data entry and increasing the risk of errors.

As the healthcare landscape evolves, addressing the sociotechnical challenges in the PA process becomes increasingly urgent. The persistence of inefficient, mistrustful relationships between providers and payers not only perpetuates administrative waste but also poses a significant barrier to broader healthcare reform efforts aimed at improving quality, reducing costs, and enhancing the patient experience. The complex system of human, technological, and organizational factors in the PA process requires a holistic approach to reform, one that considers the needs and perspectives of all stakeholders involved.

**Actor Network Theory and Technological Determinism**

To analyze the complex sociotechnical system around prior authorization (PA), this paper uses two complementary frameworks from STS (Science, Technology, and Society): technological determinism and actor network theory (ANT). These perspectives together provide

valuable insights into the relationships between technology, human actors, and organizational structures that shape the PA process.

Technological determinism asserts that technological development follows a predictable, linear path and is the primary driver of social change (Smith & Marx, 2011). In the past, technological determinism has been used to examine the impact of health information technologies on healthcare delivery and outcomes. For instance, Klecun-Dabrowska and Cornford (2000) apply this framework to analyze the implementation of telemedicine systems, exploring how these technologies reshape medical practices and patient-provider relationships. In the context of PA, technological determinism prompts the examination of how the introduction of specific technologies, such as electronic health records (EHRs), automated review systems, and digital communication platforms, have influenced the PA process. For instance, one may consider how the widespread adoption of EHRs has changed the way medical information is documented, shared, and used in PA requests. The technological determinist view would argue that the inherent properties of EHRs – their ability to store vast amounts of data, their standardized formats, and their potential for interoperability – have inevitably shaped the PA process, potentially creating new efficiencies but also introducing new challenges. Similarly, the introduction of automated review systems by insurance companies could be seen as a technological development that has fundamentally altered the nature of PA, shifting the process from a human-centered activity to one that is increasingly algorithm-driven. However, critics may argue that technological determinism oversimplifies the relationship between technology and society, neglecting the role of human agency and social factors in shaping technological systems (Greenhalgh et al., 2009). This critique is particularly relevant to the PA process, where

the implementation and use of technologies are heavily influenced by regulatory policies, organizational cultures, and the often conflicting interests of healthcare providers and insurers.

To provide a complementary approach, this paper also employs ANT. ANT provides a more nuanced approach to understanding sociotechnical systems by treating both human and non-human elements as equally important actors in a network (Latour, 2005). Historically, ANT has found valuable applications in healthcare organization studies and health policy analysis. Cresswell et al. (2010) use ANT to investigate the implementation of electronic prescribing systems in hospitals, revealing how the network of human and non-human actors impacted such initiatives. As such, this perspective is particularly relevant to the PA process, which involves a complex set of interactions between healthcare providers, insurers, patients, technologies, and regulatory policies. By tracing the associations between these actors, ANT helps reveal the hidden dynamics that contribute to inefficiencies in the PA process. Moreover, ANT provides an understanding of how different stakeholders in the PA process attempt to shape the system to serve their needs. For instance, insurance companies project their cost-control objectives into specific PA requirements, and healthcare providers, in turn, project their clinical expertise into convincing justifications for treatment. One may argue that by treating all actors as equally important, ANT might fail to adequately account for systemic inequalities or institutional power imbalances that significantly impact the PA process. However, in the context of PA, this can be countered with the fact that ANT's emphasis on tracing connections between actors can reveal hidden systemic inefficiencies overlooked by other approaches. For example, ANT can help show how seemingly neutral technologies like EHRs or automated review systems may actually perpetuate certain power dynamics between providers and insurers.

By combining technological determinism and ANT, this paper aims to provide a comprehensive analysis of the sociotechnical roots of inefficiency in PA. Technological determinism helps us understand how specific technologies have shaped the PA landscape, providing a historical perspective on how technological innovations have driven changes in the process. Meanwhile, ANT allows us to unpack the complex network of relationships that perpetuate inefficiencies in the system, offering a more in-depth view of how various actors interact in the present-day PA ecosystem. This two-way approach enables a nuanced exploration of how technological, human, and organizational factors interact to create and maintain the current state of PA. Ultimately, this integrated STS approach will inform our analysis of potential strategies for improving the PA process.

**Research Question and Methods**

This research examines the sociotechnical roots of inefficiency in prior authorization (PA), exploring the question: How do organizational tensions, misaligned incentives, and technological inadequacies between healthcare providers and payers contribute to an ineffective PA system, and what strategies could foster greater trust, collaboration, and efficiency? To address this question, the study uses a combination of documentary research and discourse analysis. The documentary research involves a thorough review of scholarly literature, including peer-reviewed journal articles in healthcare administration, health informatics, and science and technology studies. Sources are identified through academic databases such as PubMed, Web of Science, and Google Scholar. The discourse analysis focuses on public discussions and representations of PA in various media platforms, including social media, video-sharing sites, and healthcare-focused online forums. Keywords guiding this research include: prior authorization, healthcare technology, sociotechnical systems, healthcare administration, health

informatics, organizational tensions, incentive alignment, healthcare efficiency, provider-payer collaboration, and healthcare trust. Data from both methods are analyzed using guidance from the theoretical frameworks of technological determinism and actor network theory (ANT). This analysis identifies key themes, patterns, and contradictions in how PA processes are understood and experienced by various actors in the healthcare system. The paper proceeds with an introduction providing background on PA and its current challenges, followed by a literature review. The results and discussion section presents key themes and patterns identified in the research, analyzed through the lens of technological determinism and ANT. This section also proposes strategies for improving PA processes, highlights research limitations, and suggests future research directions. The paper concludes by summarizing key findings, reiterating final takeaways, and discussing the broader significance of this research.

**Results and Discussion**

The inefficiency in the prior authorization (PA) system stems from a complex network of actors including healthcare providers, payers, patients, technological systems, and regulatory bodies. Through the lens of actor network theory (ANT), this research reveals how organizational tensions, misaligned incentives, and technological inadequacies contribute to an ineffective PA system by creating adversarial relationships and information bottlenecks within the network (Desai et al., 2017). The status quo of the network favors payers at the expense of providers and patients, leading to delays in care and increased costs. Outdated technological actors, such as fax machines and phone systems, act as barriers to efficient information flow, worsening the relationships between human actors (Cresswell et al., 2010). To foster greater trust, collaboration, and efficiency, this research proposes introducing new actors and modifying existing relationships within the network. These potential solutions include implementing

automated PA systems as new technological actors to mediate between providers and payers, establishing accountability measures as regulatory actors to rebalance power dynamics, promoting provider-payer collaboration to strengthen network connections, and improving provider education to supplement the flow of information within the network. By reconfiguring these socio-technical factors through a combination of technological innovation, policy reform, and cultural shifts, it may be possible to create a more efficient, effective, and patient-centered PA process that balances cost control with quality patient care.

**Actor Network Theory Analysis of the Current PA System**

Applying ANT to the current PA system reveals a complex network characterized by imbalanced relationships and inefficient information flows. The primary actors in this network include human actors such as healthcare providers (physicians, nurses, administrative staff), payers (insurance companies, their representatives), and patients, as well as non-human actors like PA forms and protocols, communication technologies (fax machines, phones, electronic health records), and regulatory policies and guidelines. In the current network, the PA process acts as a central non-human actor that facilitates the relationships between other actors. Right now, it creates a power imbalance favoring payers, who use it as a tool to control costs and influence treatment decisions. Healthcare providers, in turn, are forced into a reactive position, spending significant time and resources navigating the PA requirements (Desai et al., 2017). The outdated technological actors, such as fax machines and phone systems, can be thought of as connections between the providers, PA system, and payers. They act as bottlenecks in the network, impeding efficient communication between human actors. These technologies, remnants of outdated healthcare best practices, fail to integrate smoothly with modern electronic health records and digital communication methods. This technological mismatch creates friction

points in the network, slowing down information flow and contributing to delays in patient care (Cresswell et al., 2010). Patients, despite being the supposed beneficiaries of the healthcare system, often find themselves marginalized in this network. They have limited agency in the PA process and frequently bear the brunt of delays and denials, positioning them as passive actors affected by the negotiations between providers and payers. Regulatory policies, another set of non-human actors, attempt to mediate these relationships but often add complexity to the network. These can be thought of as a superset to the overall PA system. While intended to ensure appropriate care and cost control, these policies can sometimes worsen tensions between providers and payers (Desai et al., 2017). This ANT analysis highlights how the current PA system's inefficiency stems not just from individual actors, but from the complex interactions and power dynamics within the entire network. The adversarial relationship between providers and payers, exacerbated by outdated technologies and complex PA regulations, creates a network configuration that struggles to achieve its intended goal of balancing cost control with quality patient care. This high level overview sets the stage for a deeper analysis on the effects of organizational tensions and outdated technologies, followed by hypotheses exploring how introducing new actors or modifying existing relationships could potentially reconfigure the network for better outcomes.

**Organizational Tensions and Misaligned Incentives**

One of the primary contributors to PA inefficiency is the fundamental tension between healthcare providers and payers. Dr. Brian Badman's analysis highlights how insurance companies have leveraged PA as a tool to increase profits by denying care, while physicians struggle with the administrative burden and its impact on patient outcomes (Badman, 2024). This misalignment of goals creates an adversarial relationship that undermines the potential for

collaboration and efficiency. The financial implications of this tension are significant, with Badman pointing out that insurance companies have seen substantial increases in stock prices over the past 20 years, while physician reimbursement has remained stagnant when adjusted for inflation. This financial disparity further exacerbates the tension between providers and payers, potentially leading to a healthcare system that prioritizes profit over patient care.

The American Medical Association (AMA) survey findings provide quantitative evidence of this tension. The survey reveals that 93% of physicians report PA-related delays in necessary care, with one-third reporting serious adverse events resulting from these delays (Mills, 2023). Furthermore, 86% of physicians believe that PA requirements lead to increased healthcare costs, contradicting the cost-saving reason often cited by insurers. This data, when viewed through the lens of ANT, illustrates how the PA process acts as a web of non-human actors that significantly influence and complicate the power dynamics between human actors (physicians, patients, and insurers) within the healthcare network. The PA process, as currently implemented, creates an imbalance that favors insurers at the expense of providers and patients, potentially exacerbating healthcare disparities and compromising patient outcomes.

**Technological Inadequacies and Their Impact: A Technological Determinism Analysis**

The research reveals significant technological gaps contributing to PA inefficiencies. J. Collins Corder's article highlights how outdated methods like fax and phone calls are in the PA process. Specifically, they disrupt clinical workflows by diverting attention from patient care (Corder, 2018). The low adoption rate of electronic PA systems (only 7% according to Corder) further exacerbates these inefficiencies. These technological inadequacies also significantly slow down healthcare administration. The AMA survey reveals that physicians spend an average of 14 hours per week completing prior authorizations, which comes out to nearly two full business

days. The resulting delay in care caused by PA processes can lead to worsening of medical conditions, increased healthcare costs due to more intensive treatments being required later, and in some cases, life-threatening situations for patients.

From a technological determinism perspective, this data suggests that the current state of PA technology is not just contributing to, but fundamentally determining the process's inefficiency. This view would argue that the reliance on manual, time-consuming methods is not a choice made by healthcare providers, but an inevitable result of the available technology. The slow adoption of electronic systems is seen as a technological lag that directly shapes the inefficiencies in the healthcare system. Moreover, from this perspective, a solution to PA inefficiencies lies primarily in technological advancement, rather than in policy changes or human factors. However, Technological determinism also suggests that as electronic PA systems become more widespread and sophisticated, this time burden will naturally decrease, reshaping physician workloads and potentially improving patient care.

**Potential Solutions and Strategies for Improvement**

The research points to several potential solutions and strategies not currently implemented that could foster greater trust, collaboration, and efficiency in the PA system. Corder's analysis suggests that automating PA screening and verification could centralize the process, potentially reducing the cost per claim from $35-$100 to just $0.66 (Corder, 2018). This significant cost reduction could translate into substantial savings for the healthcare system, potentially freeing up resources for improved patient care or research and development. The implementation of automated systems could also reduce the time physicians spend on administrative tasks, allowing for more focus on patient care and potentially improving job satisfaction among healthcare providers.

The American College of Physicians (ACP) advocates for the implementation of the 'Interoperability and Prior Authorization Final Rule,' which mandates insurers to provide specific reasons for PA denials and establish response timeframes based on urgency (American College of Physicians, 2024). Likewise, the American Medical Association's (AMA) call for insurers to be held accountable for delays and denials that adversely impact patient care could help rebuild trust between providers and payers (Mills, 2023). This accountability could take the form of financial penalties for unjustified denials or delays, or more transparent reporting of PA decisions and their impacts on patient outcomes. Such measures could incentivize insurers to accelerate their PA processes and make more sensible use of PA requirements.

Jennifer Harless's article emphasizes the importance of understanding the rationale behind PA (Harless, 2024). She argues that PAs are not about rationing healthcare but about ensuring that healthcare dollars are spent wisely. This perspective shows the need for a more cultural approach to PA reform, one echoes the belief of a balance between the need for cost control with the imperative of providing timely, appropriate care. Harless suggests that improving documentation and employing certified coders could help reduce denials and streamline the PA process.

**Limitations and Future Research**

This research is primarily supported by secondary sources, which damages its credibility. Additionally, there is a lack of direct input from insurance companies and physicians, which are the direct parties involved. Future research should include interviews or surveys with insurance company representatives to understand their perspective on PA challenges and potential solutions. This could provide valuable insights into the rationale behind certain PA requirements and potentially reveal areas where insurers and providers could find common ground.

Additionally, while this study touches on the potential of AI in improving PA processes, a more in-depth exploration of emerging technologies and their potential impact on PA efficiency would be valuable. Future research could explore how machine learning algorithms could be used to predict which treatments are likely to be approved, potentially streamlining the PA process for certain common procedures or medications. Research could also investigate the potential use of artificial intelligence in creating a more transparent, efficient PA system.

Future research could also examine the long-term effects of state-level PA reforms, such as 'Gold Card' legislation, to assess their effectiveness in reducing administrative burdens and improving patient care. This could involve longitudinal studies comparing healthcare outcomes and costs in states with and without such reforms. Furthermore, investigating the impact of PA inefficiencies on different patient populations could provide insights into potential healthcare disparities worsened by the current system. This could include examining how PA processes affect access to care for underserved populations or patients with chronic conditions requiring ongoing treatment.

Another potential area for future research is the psychological impact of PA processes on healthcare providers. Given the significant time and stress associated with PA requirements, deeper research into how these processes affect physician burnout and job satisfaction could provide valuable insights into the hidden costs of the current PA system.

**Conclusion**

In conclusion, this research demonstrates that the inefficiency in the prior authorization (PA) system stems from a complex network of actors that are littered with adversarial relationships and information bottlenecks within the network and inadequate technology adoption. By implementing automated systems, fostering collaboration between providers and

payers, establishing accountability measures, and pursuing targeted policy reforms, it is possible to create a more effective PA process. The broader significance of this research lies in its potential to transform healthcare delivery. An improved PA system would lead to more timely patient care, reduced administrative burdens for healthcare providers, and more efficient use of healthcare resources. Moreover, it would reduce a major source of friction between providers and payers, and these improvements could contribute to a more patient-centered healthcare ecosystem. The key takeaway is that fundamentally rebalancing the healthcare system to better serve patients while maintaining necessary cost controls is critical in the future of an equitable healthcare landscape. Moreover, rebalancing the healthcare system is possible through implementing streamlined, automated systems, communication channels between payers, providers, and patients, and finally restructuring the healthcare incentive system to promote timeliness and proactiveness. As healthcare continues to evolve, the lessons learned from improving PA could inform future efforts to enhance healthcare delivery and accessibility.

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