

FOUNDATIONS AND DESIGN OF AN AI-BASED SERVICE FOR FINANCIAL AND PHARMACOLOGICAL WELL-BEING

FUNDAMENTOS Y DISEÑO DE UN SERVICIO BASADO EN INTELIGENCIA ARTIFICIAL PARA EL BIENESTAR FINANCIERO Y FARMACOLÓGICO

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ABSTRACT: This paper defines a framework of relationships and processes for an electronic service aimed at supporting individuals' financial and pharmacological health, primarily through artificial intelligence and blockchain technologies, in which the theoretical foundations —legislative, technological, and conceptual— that underpin the model are established. Given the complexity of the system, the analysis focuses on educational variables —technological, financial, and health-related— and their influence on both financial and pharmacological health. The model's contribution lies in providing a reference for the design of new digital assistance services based on Big Data and AI for comprehensive personal health care. To the best of current knowledge, it is the first theoretical model to integrate relationships between these diverse health dimensions.

Keywords: technological education; health education; financial education; pharmacological health; financial health; fintech; electronic banking; insurance sector; health sector; artificial intelligence; reliable artificial intelligence.

RESUMEN: Este artículo define un marco de relaciones y procesos para un servicio electrónico destinado a apoyar la salud financiera y farmacológica de las personas, principalmente a través de tecnologías de inteligencia artificial y cadena de bloques, en el que se establecen los fundamentos teóricos —legislativos, tecnológicos y conceptuales— que sustentan el modelo.

Dada la complejidad del sistema, el análisis se centra en las variables educativas —tecnológicas, financieras y relacionadas con la salud— y su influencia tanto en la salud financiera como en la farmacológica. La contribución del modelo radica en proporcionar una referencia para el diseño de nuevos servicios de asistencia digital basados en Big Data e IA para la atención integral de la salud personal. Según los conocimientos actuales, es el primer modelo teórico que integra las relaciones entre estas diversas dimensiones de la salud.

Palabras clave: educación tecnológica; educación sanitaria; educación financiera; salud farmacológica; salud financiera; tecnología financiera; banca electrónica; sector de los seguros; sector sanitario; inteligencia artificial; inteligencia artificial fiable.

1. INTRODUCTION

The convergence of financial technology (Fintech) and health technology (Healthtech) presents an unprecedented opportunity to address systemic inefficiencies that compromise individual well-being. Currently, financial and healthcare systems operate isolated, lacking data integration or joint analysis. This fragmentation deepens «financial toxicity», where the inability to afford medication significantly impacts therapeutic adherence and health outcomes [1]. Recent studies indicate that financial toxicity correlates with higher symptom burden and suboptimal adherence across illnesses [2-4]. Concurrently, deficits in financial and health literacy limit autonomous decision-making.

This paper defines an integrated theoretical framework for an electronic service supporting individuals' financial and pharmacological health. Leveraging Artificial Intelligence (AI) and blockchain, the model provides personalized outputs while complying with EU AI Act (2024/1689).

2. LEGISLATIVE AND TECHNOLOGICAL FRAMEWORK

The model rests on four pillars: legislative, technological, financial theory, and pharmacological theory.

Legislative Framework. The EU AI Act (2024/1689) classifies AI systems evaluating creditworthiness or establishing risk for life and health insurance as «high-risk» [5]. Our framework incorporates these requirements by design, ensuring traceability, transparency, and human oversight. Data handling adheres to GDPR and HIPAA standards, protecting sensitive personal data.

Technological Infrastructure. The architecture integrates AI for predictive analysis and blockchain for security and auditability. AI algorithms process heterogeneous data to predict financial stress and medication non-adherence, increasing productivity [6]. Blockchain ensures data integrity and traceability, mitigating fraud and ensuring that health records [7]. It facilitates smart contracts that can automate compliance and insurance claims [8].

Personalized Outputs. The system generates three types of actionable, personalized recommendations: (1) *Financial*, such as risk-adjusted investment plans or savings strategies specifically designed to cover healthcare costs; (2) *Pharmacological*, like precision treatment plans that consider financial feasibility, thereby reducing abandonment rates; and (3) *Educational*, that is, targeted content to bridge literacy gaps in both domains.

4. DISCUSSION: THE FINANCIAL-HEALTH NEXUS

Comparative Analysis. While both sectors use decision trees, their objectives differ: finance maximizes assets via risk profiling, while pharmacology optimizes health via pathology segmentation. Our model demonstrates interdependence: improved financial health facilitates treatment access, while physical health enhances economic productivity [12].

Novelty and Impact. To our knowledge, no peer-reviewed literature has previously integrated financial and pharmacological health as interdependent variables managed by a single trustworthy AI service. By treating education as a transversal axis, the model empowers users rather than merely dictating actions.

5. CONCLUSIONS

This paper establishes the foundations for a Trustworthy AI electronic service bridging financial stability and pharmacological adherence. Aligned with the EU AI Act, it ensures safe, transparent high-risk AI applications. Future research should focus on prospective validation through randomized controlled trials (RCTs) to measure impact on «financial toxicity» and clinical outcomes.

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