STREAMLINING AYUSH REGISTRATIONS:
A Unified Portal for Startups

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Abstract—The AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) sector has witnessed rapid growth, fueled by increasing global interest in holistic and sustainable healthcare. However, startups in this domain face significant roadblocks during registration due to fragmented procedures, limited digitization, and lack of transparency.

This paper proposes a unified AYUSH Startup Portal designed to streamline the registration process, enhance compliance, and foster innovation. By integrating scalable ICT infrastructure, artificial intelligence, and blockchain-based verification, the portal provides a secure, efficient, and inclusive ecosystem for startups, mentors, investors, and regulatory bodies. The paper further outlines a strategic roadmap for future scalability and integration with national health platforms, empowering traditional medicine entrepreneurs to thrive in the digital era.

Index Terms—AYUSH, Blockchain, Web3j, Ethereum, Smart Contracts,Startup Registration, Java Full Stack, Artificial Intelligence, IPFS, Compliance Automation, Traditional Medicine, Healthcare IT, Digital India

I. INTRODUCTION

India's traditional medicine system, governed by AYUSH, forms an integral part of the national healthcare fabric. With growing recognition of natural therapies and preventive wellness, the AYUSH sector has become a fertile ground for entrepreneurial innovation. However, fragmented workflows, complex documentation, and the lack of a unified digital framework limit ease of doing business.

The Digital Health Platform (DHP), supported by Ayush Grid and ABDM, calls for integrated digital solutions. Most current systems are vertical and isolated, resulting in redundant data silos. To address this, we propose the AYUSH Startup Portal—a shared ICT-enabled platform to unify stakeholders and simplify operations.

II. AIMS AND OBJECTIVES

The portal aims to:
- Simplify and digitize AYUSH startup registration.
- Enhance transparency, traceability, and data security.
- Ensure real-time updates and multilingual support.
- Use AI, blockchain, and IPFS to boost innovation.
- Align with ABDM and WHO digital health standards.

III. MATERIALS AND METHODS

A. Platform Design

The system is developed using a Java Full Stack architecture, combining Spring Boot for the backend and React.js for the frontend. This technology stack ensures robustness, maintainability, and scalability while delivering a modern and responsive user interface.

Core Modules:
- **User Management:** Role-based login system for startups, administrators, and government officers.
- **Document Verification:** AI-powered compliance checks and secure cloud-based document upload.
- **Status Tracker:** Real-time updates, alerts, and registration progress tracking.
- **Multilingual Interface:** Support for multiple Indian languages following WAI-ARIA accessibility standards.

B. Integration

- **Blockchain (Ethereum via Web3j):** Tamper-proof, on-chain audit trail recorded by interacting with an Ethereum-compatible blockchain through the Web3j Java library.
- **IPFS:** Decentralized document storage
- **AI Support:** Predictive chatbot and assistant

C. Data Security

- End-to-end encryption
- JWT-based authentication
- Role-based access and disaster recovery
- All blockchain transactions—such as storing document hashes, registration events, and approvals—are signed and submitted by the backend via Web3j, ensuring interoperability and easy integration with Java applications.

D. Blockchain-Based Login and Registration Security

The portal enhances user authentication security by integrating blockchain for the management and verification of registration and login data. Utilizing the Web3j Java library, the backend communicates with smart contracts deployed on an Ethereum-compatible network to store cryptographically hashed login credentials.

This approach decentralizes the storage of sensitive authentication data, ensuring immutability and tamper resistance. Each registration and login event generates a blockchain transaction, creating an immutable audit trail accessible to authorized stakeholders, thereby enhancing transparency and regulatory compliance.

By combining blockchain with JWT-based authentication and role-based access controls in Spring Boot, the system achieves a scalable, privacy-preserving, and trustworthy authentication mechanism, tailored to the needs of the AYUSH startup ecosystem.

E. CrowdFunding

Crowdfunding (CF) is a general phrase that mean obtaining funds, typically in small amounts, from a vast population known as the crowd in order to support a business initiative, cause, loan, or other financial necessity via the designated platform. In the present Covid-19 pandemic crisis, practically every country faces the same challenge in dealing with this problem, particularly in terms of the cash required.
Many techniques have been implemented by the government inorder to manage government money in order to combat the Covid-19 epidemic. This situation induced community for donations to assist the government in combating the Covid-19.

Of fact, raising funds is a difficult procedure since it involves confidence between many parties, including funders, middlemen, or organisations that serve as a location to hold temporary cash. Trust is the key capital for fundraising organisations which built credibility of investors to commit their monies to fund recipients. This research based on the processes that help investor for fundraising with the help of blockchain technology. This will automat fundraising process without worry of fraud or wrong place allocation of fund. By using smart contract technologies. This technique can be employed in the communications and medical industries.

IV. IMPLEMENTATION CHALLENGES AND SOLUTIONS

Integrating blockchain for authentication into an existing Spring Boot backend infrastructure, such as the AYUSH Startup Portal, presents several challenges. However, careful design and the use of modern tools like Web3j can effectively address these issues. This section outlines key technical challenges and their corresponding solutions:

A. Complexity of Integration

Challenge: Blockchain introduces a distributed and cryptographic model that may be new for traditional backend developers.
Solution: Use Java libraries like Web3j to simplify low-level blockchain interactions. Take a modular approach by integrating small, separate blockchain components before scaling up to the entire platform.

B. Performance and Latency

Challenge: On-chain operations, especially on public blockchains, introduce delays due to consensus processes.
Solution: Implement asynchronous workflows that delay blockchain writes to background tasks. Use off-chain caching and local databases for quick user responses, while keeping the blockchain as the ultimate source of truth.

C. Cost of Transactions

Challenge: Each on-chain operation, like user registration or login logging, comes with gas fees on public networks.
Solution: Reduce costs by batching transactions and using layer-2 solutions such as Polygon. Alternatively, consider using permissioned or private blockchains to avoid transaction fees and maintain full control.

D. Data Privacy and Compliance

Challenge: Storing sensitive user data on an immutable blockchain can violate privacy laws like GDPR.
Solution: Store only hashed values or zero-knowledge proofs on-chain. Keep sensitive biometric and personal data encrypted and stored off-chain. Follow principles of data minimization and access control.

E. User Experience and Adoption

Challenge: The blockchain-based login process might seem unfamiliar to users, especially those without technical backgrounds.
Solution: Maintain traditional login methods (e.g., username/password or biometric) while keeping blockchain operations hidden. Use Spring Security with JWT tokens for a familiar interface and offer fallback options for accessibility.

F. Smart Contract Security

Challenge: Vulnerabilities in smart contracts can be exploited, leading to data breaches or unauthorized access.
Solution: Conduct thorough audits of smart contracts, use formal verification tools, and rely on established frameworks. Keep logic simple and modular for easier testing and upgrades.

G. Interoperability with Existing Systems

Challenge: Blockchain authentication needs to work with legacy identity management systems and databases.
Solution: Introduce middleware REST APIs in Spring Boot that connect with Web3j for blockchain access, ensuring compatibility with traditional system interfaces and authentication layers.

V. Discussion

The AYUSH Startup Portal addresses key bottlenecks by reducing redundancy and paperwork. Blockchain ensures document integrity, while IPFS and encryption strengthen data resilience. The chatbot improves usability for non-tech users.

Beyond registration, this digital ecosystem will offer funding access, performance analytics, and mentorship—creating a one-stop innovation hub for AYUSH entrepreneurs aligned with WHO and ABDM goals.

A. Challenges with the Allopathy-Centric Model

The situation in much of rural India is very different from that of people who live in cities. It is merely not talked about outside of stories about women giving birth in a dusty street or needing to be carried for hours to get to medical facilities for tough deliveries. The answer proposed by the Indian medical establishment, which is driven by allopathy, is to build an increasing number of sizable hospitals around the country. Large hospitals focus on allopathy facilities due to the requirement for specialised staff and equipment. People from distant locations find it difficult to obtain these because they are only practical in heavily populated city centres.

While away from their own homes and means of support, carers must find housing, food, and transportation in strange places at a great expense. It is challenging for physicians to offer personalised care and attention despite dealing with a large patient load and long workdays; frequently, the hospital ward physician is an intern who works a 36-hour sleepless shift. New physicians typically attempt to avoid remote service or postings due to inadequate infrastructure.

A seasoned surgeon in Bengaluru said [**?**] that there were only two or three specialists throughout the rest of Karnataka for a certain speciality, but there were 100 within five kilometres of his home in the city of Bengaluru, all of whom were having difficulty finding patients. Rural areas are neither appealing nor viable for hospitals or the majority of doctors for the reasons listed above. Despite their grand opening, some token structures will undoubtedly remain understaffed, dilapidated, and unwelcoming years later. Such establishments can be found throughout India.

Surgery and the urgent treatment of illnesses are the main goals of allopathy, and it is unquestionably very efficient in both. The expenses associated with allopathy are extremely high. Medical education is very costly and difficult to get entry to. The high dropout rate is a result of the demanding program. Graduates require specialisation in order to advance, and they begin their careers heavily indebted. There is pressure on them to acquire substantial pay and additional revenue. Schedules become increasingly demanding when one achieves success. Misconduct and high, growing expenses are imposed by insurance premiums.

Many of the worldwide issues with the allopathy system are evident in India, including excessively long working hours for residents. Requirements for rural service accompany school subsidies, and there is pressure to obtain experience working at high-density hospitals in order to be admitted to the most profitable niche markets.

In summary, it is plausible to infer that allopathy is stuck in a Gordian knot of its own design and is unlikely to resolve itself, even with the best efforts of numerous intelligent and committed individuals. It is unable to give the great majority of Indians living in rural regions access to quality medical treatment.

B. Lessons from COVID-19

Many peculiarities in medical research and publication were brought to light by the COVID-19 story, which is outside the purview of this work. However, a significant demand for psychological support is expected [**?**], for which community support and Ayurveda are far more suitable. We believe that allopathy contributes essential surgical methods, diagnostic tools, and drugs for acute illnesses (such as the COVID-19 mRNA and other vaccines). Months after our 2019 Panel, the COVID-19 pandemic hit. To match their bravery and commitment, the Indian government and medical community quickly advanced in terms of creativity and adaptability.

Private telemedicine networks run by large hospitals were expanded in India. Through the eSanjeevaniOPD Teleconsultation Portal [**?**], patients and carers alike could contact participating staff physicians after downloading the app to their mobile device. Ayurveda, allopathic, and other doctors offered to be on call in order to staff the system around the clock. ASHA field workers, who have paramedical training but are neither physicians nor nurses, worked courageously and tenaciously, making house calls and establishing connections with specific doctors via networks. Through the same networks, doctors from as far away as the USA volunteered to assist Indian physicians in saving lives. To put it another way, the idea of integrating traditional and modern medicine turned out to be practically useful.

While the papers cited above on Ayurveda include those with the standard racist ignorance about "magic" and "pseudoscience," the COVID-19 experience removed all doubt. The most advanced allopathy systems had the worst results. Well over 1 million known deaths and untold numbers with severe long-term effects were recorded in the USA, with equally grim

figures in the UK and much of Europe. Numbers in China, where the pandemic is said to have started, are unknown and unreliable: a census result that cited a sharp drop of over 20 million—coincident with the number of reported phone numbers rendered inactive—was quickly suppressed. Hospitals tried their best but were overwhelmed: many patients died in ambulances (including a close relative of the first author) while being shuttled from one over-filled hospital door to another through messy urban traffic. Rural people simply did not have access to urban hospitals. Doctors working without sleep in urban hospitals were not in a position to go out to villages.

The stringent COVID-19 lockdown procedures might have prevented urbanites from taking advantage of China's robust traditional healthcare system, despite the fact that it is acknowledged and approved by recent World Health Organisation regulations [?]. Other treatments were swiftly introduced online in Taiwan [?], [?], Japan [?], and Korea [?], assisting traditional cures and reducing losses. By any fair measure, Ayurveda was a huge success in India, despite attempts from some quarters to portray victory as failure. Because the death toll was so much lower than anticipated, western organisations and their Indian counterparts made accusations, with the justification that "since we are lying, you must be lying too."

Indians brought out the best of allopathy through vaccine development, and the best of Ayurveda through a host of remedies [?], [?], [?], [?]. At minimum, these kept COVID cases from intensifying into the "cytokine storm" [?] which was ultimately blamed for most deaths: the body's violent reaction to the fast-spreading virus strained the already weakened human body past the point of endurance, and vital organs failed. Nearly everyone in India by now reports having come down with COVID-19 symptoms, testing positive if they ran tests. But the vast majority (including the first author) experienced only mild symptoms. India has beaten the pandemic, even as indigenous vaccines steadily marched on to cover the entire population.

The patient is stuck in the middle, suffering unaffordable expenses and limited accessibility, and there is no reason to revert to the murky circumstances where many streams of medical practice do not acknowledge or communicate with one another. In order to provide everyone, regardless of where they reside, with excellent, uncompromised health care and wellness, we examine the next stages in this article. A further revolution was made possible by the work done during the pandemic.

VI. Conclusion

The AYUSH Startup Portal transforms traditional healthcare entrepreneurship by merging digital governance with AI and blockchain. Future upgrades include:

- ML-based personalized startup suggestions
- Aadhaar/DigiLocker integration
- Real-time analytics dashboards

This system not only streamlines bureaucracy but fosters a self-reliant, digital-first AYUSH ecosystem.

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