

Startup AYUSH Portal

Dr. Vikas Singhal

Head, Department of Information Technology
Greater Noida Institute of Technology (Engg. Institute), Greater Noida, INDIA
hodit@gniot.net.in

Neera Rawal

Department of Information Technology
Greater Noida Institute of Technology (Engg. Institute), Greater Noida, INDIA
neerarawal540@gmail.com

Mohd. Asif

Department of Information Technology
Greater Noida Institute of Technology (Engg. Institute), Greater Noida, INDIA
mohdasifmak22@gmail.com

Mohd. Azeem

Department of Information Technology
Greater Noida Institute of Technology (Engg. Institute), Greater Noida, INDIA
Mohd.azeem3603@gmail.com



Publication History:

Manuscript Reference No: IJIRIS/RS/Vol.10/Issue05/AUIS10091

Research Article | Open Access | Double-Blind Peer-Reviewed | Article ID: IJIRIS/RS/Vol.10/Issue06/NVIS10091

Received: 03, November 2024 Revised: 12, November 2024 Accepted: 17, November 2024 Published Online: 30, November 2024, Volume 2024 Article ID NVIS10091 <https://www.ijiris.com/volumes/Vol10/iss-06/06.NVIS10091.pdf>

Article Citation: Vikas, Neera, Mohd. Asif, Mohd. Azeem (2024). Startup AYUSH Portal. International Journal of Innovative Research in Information Security, Volume 10, Issue 05, Pages 697-707

doi: <https://doi.org/10.26562/ijiris.2024.v1006.06>

BibTex key: Vikas@2024Startup



Copyright: ©2024 This is an open access article distributed under the terms of the Creative Commons Attribution License; which Permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract: The AYUSH Portal is designed to promote the incorporation of India's traditional medicinal systems Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy into the nation's healthcare ecosystem. Recognizing the increasing global acceptance of AYUSH practices, the Government of India has initiated Centers of Excellence to support prominent institutions involved in research and education and drug development. Notable initiatives include collaborations with premier institutions such as AIIMS and IIT Jodhpur to explore integrative health research and address key public health challenges. Programs like the Ayurgyan and Ayurswasthya Schemes prioritize research in the AYUSH sector, promoting innovations in preventive and integrative health care. The establishment of the AYUSH-ICMR Advanced Center for Integrative Research seeks to create a vibrant ecosystem for scientific validation of traditional practices. During the COVID-19 pandemic, the Ministry of AYUSH demonstrated the efficacy of traditional medicine by releasing clinical management protocols and guidelines based on Ayurveda and Yoga, highlighting their role in public health emergencies. This paper discusses the methodology adopted in the AYUSH Portal, emphasizing collaborative research efforts, intellectual property rights, and the integration of AYUSH therapies in mainstream healthcare to achieve the goal of "One Nation, One Health."

Keywords: AYUSH, Traditional medicine, Medical informatics, Ayurveda, Siddha

I. INTRODUCTION

The strategic integration of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy) with in the Indian healthcare system has catalysed a transformative shift, emphasizing the Government of India has launched various initiatives aimed at strengthening the development and promotion of AYUSH systems visibility and accessibility of AYUSH practices, with the National AYUSH Mission (NAM) being a pivotal effort launched in September 2014. This Centrally Sponsored Scheme aims to strengthen AYUSH services across states, with an emphasis on the preventive and promotive dimensions of healthcare. The incorporation of AYUSH into esteemed healthcare institutions, such as hospitals and tertiary care setups, exemplifies a commitment to providing cost-effective traditional healthcare that is universally accessible. This has resulted in a significant rise in the number of beneficiaries, with AYUSH contributing actively to various sectors, such as defense services. Moreover, the creation of a dedicated AYUSH division under the Directorate General of Health Services (DGHS) highlights the critical role of traditional medicine within the country's healthcare system. AYUSH has significantly contributed to initiatives such as Poshan Abhiyaan, increased inpatient admissions, and the NABH accreditation of AYUSH hospitals, showcasing its comprehensive role in enhancing public health. The ongoing integration of AYUSH practices into institutions like AIIMS (All India Institute of Medical Sciences) aims to enhance accessibility and demonstrate the transformative role AYUSH plays in shaping a more inclusive and comprehensive healthcare system in India.

A. History

- 1) The historical evolution of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy) in India can be traced through various policy initiatives and planning documents that emphasize the integration of traditional medicine into the healthcare system. Successive Five-Year Plans, formulated initially by the Planning Commission of India and later by NITI Aayog, have consistently focused on promoting alternative, particularly indigenous, forms of medicine.
- 2) The Government of India has established several committees aimed at enhancing the healthcare sector, notably the Bhore Committee in 1946, the Mudaliar Committee in 1961, and the Srivastava Committee in 1975. These committees highlighted the necessity for improving traditional systems of Indian medicine, recognizing their potential to contribute to a comprehensive healthcare strategy.
- 3) Subsequent national policies further reinforced this commitment. The National Health Policy (1983) and the National Education Policy in Health Sciences (1989) acknowledged the critical role of Indian Systems of Medicine (ISM) and Homeopathy (H) in improving healthcare accessibility, especially in rural regions where access to adequate health services remains limited. The National Health Policy (2002) reiterated this vision, advocating for the integration of AYUSH into the mainstream healthcare framework to enhance accessibility and affordability.
- 4) Overall, these historical milestones reflect the growing recognition of AYUSH's role in India's healthcare landscape, underscoring its importance in providing diverse and culturally relevant healthcare options for the population.

B. Importance Of Ayush

I. Economic Significance of AYUSH

1) Sector Growth

- AYUSH's development contributes significantly to economic growth, with increases in manufacturing, exports, and the rise of MSMEs (Micro, Small & Medium Enterprises) and startups.
- The exponential rise of the AYUSH sector is marked by its 6-fold increase in market size, from ₹21,697 crore (USD 2.85Bn) in 2014-15 to ₹1,37,800 crore (USD 18.1 Bn) by 2020.

2) Manufacturing & Exports

- AYUSH's manufacturing industry, including Ayurveda, Homeopathy, Unani, Siddha, and other traditional medicine systems, has strengthened India's status as a global player.
- The sector's export potential is overseen by the Ayush Export Promotion Council (AYUSHEXCIL), launched in 2022 to promote AYUSH products and services internationally.

II. Entrepreneurship and Startups in AYUSH

I. Encouraging Startups

- The Ministry of AYUSH promotes innovation and entrepreneurship through programs such as the Champion Services Sector Scheme for Medical Value Travel, which offers financial support to private investors. The All India Institute of Ayurveda (AIIA) launched AIIA-ICAINE, an incubation center for fostering new ventures. The startup ecosystem in AYUSH is thriving, with 900 DPIIT-recognized startups by December 2022, many emerging from Tier 2 and Tier 3 cities.
- Job Creation: These startups have created nearly 8,500 jobs, contributing to both economic growth and the promotion of traditional Indian medical systems globally.

III. Ease of Doing Business

I. Regulatory Reforms

- 100% FDI (Foreign Direct Investment) is permitted in the AYUSH sector through an automatic route, enhancing ease of doing business. Licensing for AYUSH drugs has been streamlined through digital platforms like E- Aushadhi, ensuring paperless, transparent processes.

2. Compliance Reductions

- The Ministry of AYUSH has reduced compliance burdens by easing 23 identified compliances for AYUSH drugs, simplifying the Drugs & Cosmetics Act 1940.

IV. Quality Control & Standardization

I. Global Collaboration

- AYUSH works in partnership with the World Health Organization (WHO) to improve and standardize quality measures on a global scale, improving trust in AYUSH products.
- The Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H) establishes quality standards for AYUSH drugs, facilitating their growth in both domestic and international markets.
- Initiatives such as AOGUSY (Ayush Oushadhi Gunvatta evam Utpadan Samvardhan Yojana) aim to enhance the quality of AYUSH products while fostering human resource development within the sector.

V. PROMOTING TRADITIONAL PRACTICES GLOBALLY

1. Ayush Visa

- The Ayush Visa was introduced to facilitate medical tourism for foreigners seeking treatment under AYUSH systems, promoting India as a global hub for traditional medicine.

2. Ayurveda Aahara Regulations (2022)

- These regulations promote traditional food practices, ensuring food safety and encouraging innovation in Ayurvedic food products, further boosting consumer confidence in AYUSH.

C. Current Initiatives

The AYUSH sector has undergone transformative development, driven by various initiatives aimed at strengthening the sector both domestically and globally. These initiatives span across regulation, entrepreneurship, export promotion, and quality assurance, positioning AYUSH as a key player in India's healthcare and wellness industries.

1. Promotion of Entrepreneurship

Champion Services Sector Scheme for Medical Value Travel: This central initiative provides financial support to private investors in the form of interest subsidies, facilitating the establishment of super-specialty hospitals and daycare centers dedicated to AYUSH systems.

- The scheme aims to nurture entrepreneurship in medical tourism, creating a conducive ecosystem for investment in the AYUSH sector.
- All India Institute of Ayurveda (All India Institute of Ayurveda) established the Incubation Centre for Innovation and Entrepreneurship (ICAINE), promoting innovative startups in AYUSH. This initiative fosters entrepreneurship by transforming academic knowledge into commercial ventures, ensuring the growth of a startup culture within the sector.
- AYUSH Startup Grand Challenge
- An initiative launched to empower startups in the AYUSH sector. The challenge encourages young entrepreneurs to develop innovative solutions and products in the domain of traditional medicine and wellness.

2. MSMEs and Startup Ecosystem

- a. MoU with Ministry of MSME
- The Ministry of AYUSH has entered into a Memorandum of Understanding (MoU) with the Ministry of Micro, Small & Medium Enterprises (MSME) to foster the growth and development of AYUSH-based enterprises. This collaboration supports the rapid growth of the MSME sector within AYUSH, contributing to job creation and economic growth.
- b. Growth in MSME Units
- The number of AYUSH-related MSMEs has grown significantly, from 38,216 units in 2021 to 53,023 units in 2023, reflecting the sector's increasing economic footprint.

3. Export Promotion Initiatives

- Ayush Export Promotion Council (AYUSHEXCIL):
- Launched in 2022, AYUSHEXCIL was established to promote the global export of AYUSH products and services. The Council oversees the trade of Ayurveda, Homoeopathy, Siddha, Unani, and other traditional medicine products, addressing trade issues and expanding AYUSH's global market share.
- 100% FDI (Foreign Direct Investment): To encourage foreign investment, 100% Foreign Direct Investment (FDI) in AYUSH is allowed through the automatic route, facilitating easier entry for global investors and enhancing the ease of doing business within the sector.

3. Ayush Visa for Medical Tourism

- a. Introduction of Ayush Visa:
- A special visa category, the Ayush Visa, was introduced to promote medical tourism for foreign nationals seeking traditional AYUSH treatments like wellness therapies, yoga, and other forms of care in India.
- This initiative is expected to significantly increase India's role as a destination for medical value travel.

4. Quality Control and Standardization

- a. Ayush Oushadhi Gunvattaevam Utpadan Samvardhan Yojana (AOGUSY):
- This scheme aims to enhance the quality and production standards of AYUSH products, ensuring that they meet Good Manufacturing Practices (GMP) guidelines and adhere to international standards. It strengthens the regulatory framework and technical capacity in the production of AYUSH products to promote consumer confidence.
- b. Pharma covigilance Program (Ayushsuraksha):
- A dedicated pharma covigilance program monitors the safety, efficacy, and quality of AYUSH products, ensuring their safe use. The Ministry of AYUSH also collaborates with the World Health Organization (WHO) to globally harmonize AYUSH standards and promote safe and reliable traditional medicine products worldwide.
- "One Herb, One Standard" Initiative: Through a partnership between the Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H) and the Indian Pharmacopoeia Commission (IPC), this initiative ensures the development of unified quality standards for Indian herbs, aligning them with global benchmarks.

5. Ease of Doing Business

- E-Aushadhi Portal: The Ministry of AYUSH has digitized the licensing process for manufacturing AYUSH products through the E-Aushadhi portal, making it swift, paperless, and transparent. The initiative improves ease of doing business, helping manufacturers obtain drug licenses more efficiently.
- Perpetual License for ASU Drugs:
- A perpetual licensing system for Ayurveda, Siddha, and Unani (ASU) drugs has been implemented, reducing compliance burdens by allowing lifetime validity for product licenses, subject to annual self-compliance submissions.
- Reforms in Leading AYUSH Manufacturing States:
- States like Uttar Pradesh, Himachal Pradesh, Karnataka, and Kerala have implemented reforms under the Ease of Doing Business (EoDB) framework, creating an industrial ecosystem that supports product manufacturing and investment in the AYUSH sector.

6. Pharmacopoeial Standards and International Collaboration Development of ASU&H Monographs:

- The Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H) has developed over 2,259 monographs for single drugs and 405 for multi-ingredient formulations, creating a comprehensive set of quality standards for AYUSH products.
- These standards ensure the safety, quality, and efficacy of AYUSH products, promoting their acceptance in both domestic and international markets.

D. Integration with Modern Healthcare

The integration of AYUSH (Ayurveda, Yoga, Unani, Siddha, and Homeopathy) with modern healthcare is a strategic priority for the Government of India. The goal is to create a more holistic healthcare system that combines the strengths of traditional medicine with modern medical science. This complementary approach enhances the accessibility, effectiveness, and affordability of healthcare for the general population.

1. Mainstreaming AYUSH in Public Health

- AYUSH Health and Wellness Centers (HWCs): As part of the Ayushman Bharat program, AYUSH Health and Wellness Centers are being set up across India to deliver preventive, promotive, and curative healthcare services. These centers focus on the promotion of health and wellness through traditional systems of medicine while integrating them with modern healthcare services for improved outcomes.
- Collaboration with National Health Mission (NHM): The Ministry of AYUSH partners with the National Health Mission (NHM) to integrate AYUSH systems into primary healthcare. AYUSH practitioners are stationed at health sub centers, primary health centers (PHCs), and community health centers (CHCs) to enhance service delivery. working alongside allopathic doctors to provide comprehensive care.

2. AYUSH-Integrated Medical Facilities

- Co-location of AYUSH Facilities in Hospitals: A significant initiative involves the co-location of AYUSH units in district hospitals, community health centers, and primary health centers helps integrate AYUSH systems into mainstream healthcare, improving accessibility and service delivery. Enabling patients to access both AYUSH and allopathic services under one roof. This model encourages a collaborative approach where patients can choose a treatment pathway or a combination of both systems, based on their specific health needs.
- AYUSH Hospitals in Public Sector:
Various government and private hospitals now have dedicated AYUSH wings, providing specialized care in areas such as pain management, rehabilitation, and lifestyle-related disorders. AYUSH hospitals are also being integrated into the broader healthcare infrastructure through tie-ups with tertiary care hospitals, offering complementary treatment to modern medical interventions.

3. AYUSH and Modern Medicine Collaboration

- Research Collaborations and Clinical Trials: Collaborative research is being conducted between AYUSH institutions and modern Medical research organizations, including the Indian Council of Medical Research (ICMR), collaborate to scientifically validate AYUSH therapies. These studies focus on assessing the effectiveness of AYUSH treatments for chronic conditions such as diabetes, cancer, cardiovascular diseases, and neurological disorders, leading to evidence-based integration with modern medical practice.
- Cross-Referral Systems: To enhance patient care, cross-referral systems between AYUSH practitioners and modern medical doctors have been established in some regions. Patients receive the most appropriate form of care based on their condition, combining modern diagnostics with AYUSH treatment protocols.
- Integrative Medicine Centers: Institutions like the All India Institute of Ayurveda (AIIA), in collaboration with modern medical institutions, have established integrative medicine centers. These centers focus on patient centric care, combining modern diagnostics and treatment methods with traditional AYUSH therapies for chronic diseases, lifestyle disorders, and preventive healthcare.

4. Training and Education for Integrative Care

- Interdisciplinary Training Programs: The Ministry of AYUSH, in partnership with medical institutions, has introduced interdisciplinary training programs to familiarize modern medical practitioners with AYUSH systems. Similarly, AYUSH practitioners are being trained in modern diagnostics and treatment protocols to ensure a seamless integration of care.
- Dual Practice Opportunities: Recognizing the growing demand for integrative medicine, medical professionals in both fields are encouraged to pursue dual qualifications in modern and AYUSH medicine. This allows them to provide holistic care by combining the diagnostic strength of modern medicine with the therapeutic efficacy of traditional systems.

5. Integrating AYUSH in Medical Value Travel

- Medical Value Travel (MVT) and Wellness Tourism: India's growing status as a global wellness hub is further solidified by integrating AYUSH into Medical Value Travel (MVT). International patients seeking holistic and preventive healthcare are increasingly combining modern medical treatments with AYUSH therapies, such as Panchakarma, Yoga, and Ayurveda, for comprehensive healing experiences.
- Medical Tourism Collaboration: The Ministry of AYUSH collaborates with the Ministry of Tourism and private healthcare providers to create specialized packages for international patients seeking integrative treatments.
- This strengthens India's position as a destination for holistic healthcare, integrating modern medicine with traditional wellness practices.

- Policy and Legal Framework for Integration National Health Policy 2017:
The National Health Policy (NHP) 2017 emphasizes the integration of AYUSH services into the national health system. It advocates for the inclusion of AYUSH in the mainstream healthcare system, ensuring that traditional medicine becomes a significant part of India's overall healthcare delivery framework.
 - National AYUSH Mission (NAM): The National AYUSH Mission (NAM) promotes the integration of AYUSH services in public healthcare systems through co-location, financial support for infrastructure, and training of AYUSH professionals. NAM aims to enhance the accessibility of traditional medicine while improving its integration with modern healthcare at all levels.
 - Ayurveda Arogya Kendras: Under NAM, Ayurveda Arogya Kendras have been established to deliver integrated AYUSH care in rural and urban areas. These centers provide both primary and secondary healthcare services, with a focus on preventive healthcare through Ayurveda, along with referrals to modern medicine specialists when necessary.
- 6. Pandemic Response and AYUSH**
- COVID-19 Integration: During the COVID-19 pandemic, AYUSH played a complementary role in preventive health and immune-boosting strategies. AYUSH protocols were integrated into national guidelines for managing COVID-19, particularly in preventive care and post-recovery rehabilitation. The Ministry of AYUSH also collaborated with the Ministry of Health and Family Welfare to set up integrative COVID care centers.
 - Scientific Research on AYUSH Interventions: Several research studies were initiated to explore the efficacy of AYUSH-based preventive and therapeutic interventions for COVID-19. These efforts were conducted in collaboration with leading medical and research institutions, contributing to the global understanding of AYUSH's role in managing pandemics and other public health crises.

VI. METHODOLOGY

The methodology for developing the Startup AYUSH Portal was structured around a user-centric approach, leveraging a systematic process to design, implement, and validate a collaborative platform that meets the diverse needs of the AYUSH eco system. The process was divided into sequential stages to enable an organized workflow, as illustrated in the flow diagrams. The key stages are outlined below.

1. System Design and Requirement Analysis

The design and analysis phase was critical in determining the functionalities required to serve various stakeholders, including investors, startups, mentors, and the public.

- Requirement Gathering: Through surveys and interviews with AYUSH practitioners, patients, healthcare professionals, and government representatives, a list of core requirements was identified. These include user registration, role based dashboards, and features to facilitate investment, mentorship, and resource sharing.
- User Roles and Functionalities: Four primary user roles were defined, each with a tailored dashboard and feature set:
 - Investor: Focused on viewing and searching startups, with the ability to submit investment interests.
 - Startup: Able to create and manage listings, and search for potential investors.
 - Mentor/Incubator: Provides mentorship or incubation support to startups.
 - Public User: Accesses resources and information on AYUSH practices.

2. User Registration and Initial Access

The registration process, as depicted in Part I: Registration and Initial Access of the flow chart, begins with the user accessing the portal and deciding whether they need to register.

- User Access and Registration: Upon entering the portal, unregistered users are directed to complete registration based on their role, selecting from options such as Investor, Startup, or Mentor. Existing users can proceed directly to the login page.
- Data Collection: User information, including role specific details, is securely collected and stored in the database to customize the portal experience.

3. Login and Role Determination

After registration, users proceed to login and role determination, as shown in Figure 2: Login and Role Determination.

- Authentication and Role-Based Access: Users log in to the portal, where the system identifies their role (Investor, Startup, Mentor/Incubator, or Public User) and directs them to their respective dashboard.
- Connector Pathways: Depending on the role, users are directed to the next stage through Connector B, ensuring a streamlined transition to role-specific functionalities.

4. Dashboard Interactions and Feature Access

The core functionalities are available through dashboards that cater to each user type, as illustrated in Part 3: Dashboard Interactions and Log Out.

- Investor Dashboard: Allows investors to view startups, search for potential investment opportunities, and submit investment interests.
- Startup Dashboard: Enables startups to create listings and manage their profiles, making it easier for investors to discover them.
- Mentor/Incubator Dashboard: Mentors can view startups seeking guidance and offer mentorship or incubation services.
- Public User Dashboard: Provides access to AYUSH related resources, promoting awareness and information dissemination. Each dashboard provides tailored options based on user needs, optimizing the interaction and functionality of the platform for each stakeholder.

Startup AYUSH Portal - Part 1: Registration and Initial Access

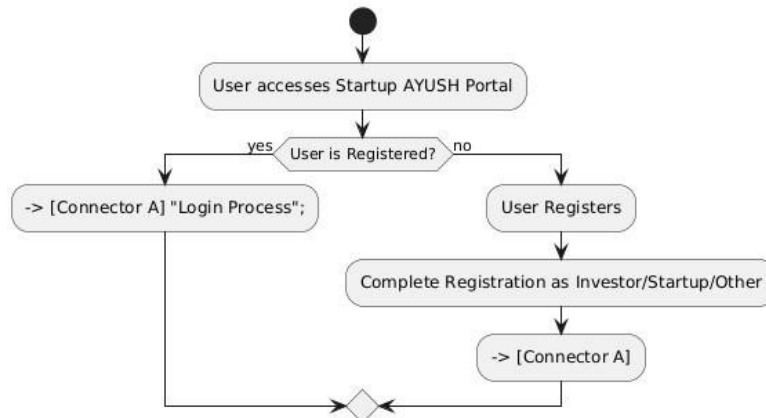


Fig:1. Flowchart for Registration and Initial Access illustrates the decision points and entry paths based on user registration status.

Startup AYUSH Portal - Part 2: Login and Role Determination

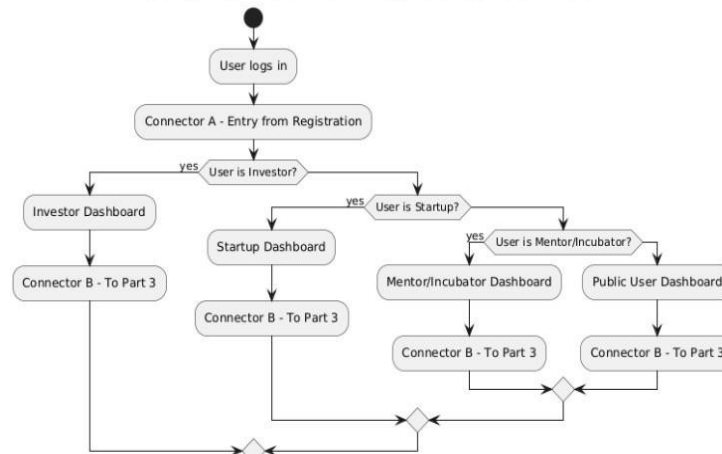


Fig:2. Flowchart for Login and Role Determination highlights the role-based pathways upon successful login.

5. Dash board Interactions and Feature Access

The core functionalities are available through dashboards that cater to each user type, as illustrated in Part 3: Dashboard Interactions and Log Out.

- Investor Dashboard: Allows investors to view startups, search for potential investment opportunities, and submit investment interests.
- Startup Dashboard: Enables startups to create listings and manage their profiles, making it easier for investors to discover them.
- Mentor/Incubator Dashboard: Mentors can view startups seeking guidance and offer mentorship or incubation services.
- Public User Dashboard: Provides access to AYUSH related resources, promoting awareness and information dissemination. Each dashboard provides tailored options based on user needs, optimizing the interaction and functionality of the platform for each stakeholder.

Startup AYUSH Portal - Part 3: Dashboard Interactions and Log Out

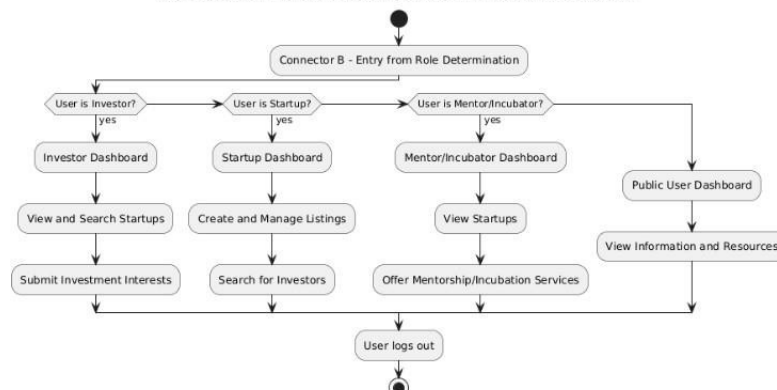


Fig: 3. Flowchart for Dashboard Interactions and Log Out represents the structure of interactions available for each user type.

6. Technologies Used

To build a secure, scalable, and responsive platform, a combination of backend and front end technologies were employed.

- Backend Technologies:
 - Node.js: Used for handling server-side logic and backend functionalities.
 - No SQL Database (Mongo DB): Handles unstructured data such as articles and historical AYUSH content.
 - APIs (RESTful): Enables smooth data exchange between system components and external healthcare databases.
- Frontend Technologies:
 - React.js or Angular.js: Used for developing a dynamic, responsive interface.
 - HTML5, CSS3, JavaScript: Ensures the portal is accessible and user-friendly.
- Integration Standards:
 - HL7 and FHIR: Facilitate interoperability between AYUSH and modern healthcare systems, allowing for secure health data exchange.
- Cloud Computing and Security:
 - AWS or Azure: Provides reliable cloud hosting with high availability.
 - Encryption and Compliance: Ensures compliance with HIPAA and India's Personal Data Protection Bill, safeguarding sensitive data.

6. Testing and Validation

To ensure the system's robustness and usability, various testing procedures were employed:

- Unit Testing: Verifies the functionality of individual modules.
- Integration Testing: Ensures seamless interaction between system components.
- User Acceptance Testing (UAT): Conducted with end- user store fine the system based on real-world feedback.

7. Deployment and Maintenance

Post-development, the portal was deployed with CI/CD practices to facilitate continuous updates and monitoring, ensuring that the platform remains efficient and secure.

- CI/CD Pipelines: Automate the testing and deployment of updates.
- Maintenance and Monitoring: Tools like New Relic or Datadog help in performance monitoring and detecting potential issues.

This detailed methodology, supported by flow diagrams, provides an overview of the structured process involved in the development and deployment of the AYUSH portal, ensuring it meets the goals of promoting the AYUSH ecosystem through effective collaboration and technology integration.

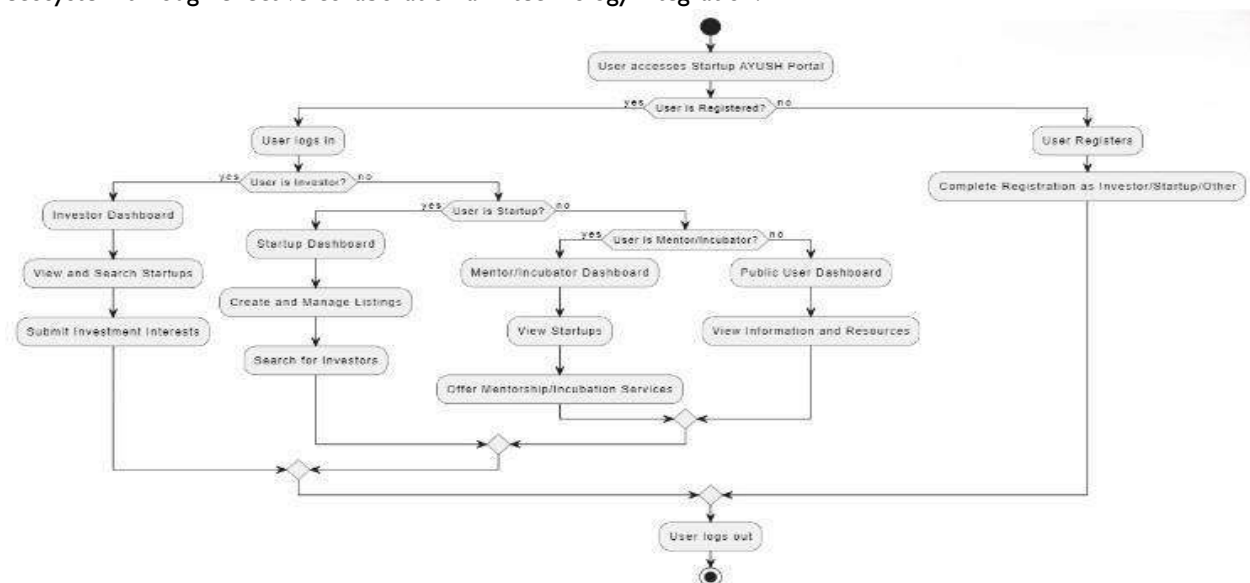


Fig:4. Flowchart for Ayush

V. ALGORITHM: AYUSH STARTUP PORTAL

This algorithm outlines the main processes, from registration and login to role-based access and dashboard interactions.

1. Start
2. Initialize System
 - a. Set up necessary backend, frontend, and database configurations.
 - b. Define user roles (Investor, Startup, Mentor/Incubator, and Public User) and their respective access permissions.

Registration Process

3. Registration and Initial Access
 - Step3.1: User accesses the Startup AYUSH Portal.
 - Step3.2: Check if the user is registered.
 - (i) If yes, proceed to login (go to Step 4).
 - (ii) If no, prompt the user to register.

- Step 3.3: User selects a role (Investor, Startup, Mentor/Incubator, or Public User) and completes registration.
- Step 3.4: Save user details in the database.
- Step 3.5: Redirect the user to the login page.

Login and Role Determination

4. Login and Role Determination

- Step 4.1: User logs into the system with their credentials.
- Step 4.2: Authenticate user details.
- If authentication fails, display an error message and return to the login page.
- If authentication is successful, proceed to role determination.
- Step 4.3: Check user role:
 - If Investor, redirect to the Investor Dashboard.
 - If Start up, redirect to the Startup Dashboard.
 - If Mentor/Incubator, redirect to the Mentor/Incubator Dashboard.
 - If Public User, redirect to the Public User Dashboard.

Dash board Interactions and Functionalities

5. Dashboard Interactions and Functionalities

- Step 5.1: Based on user role, load the respective dashboard.
- Investor Dash board:
 - View and search startups for potential investment opportunities.
 - Submit investment interests in startups.
- Startup Dash board:
 - Create and manage startup listings to attract investors and mentors.
 - Search for investors who may be interested in their startup.
- Mentor/Incubator Dashboard:
 - View available startups seeking guidance.
 - Offer mentor ship or incubation services to startups.
- Public User Dashboard:
 - Access AYUSH resources and general information about AYUSH practices.
- User Actions
 - Based on role-specific options, execute selected actions (e.g., investor submits interest, startup updates listing, etc.).

Data Handling and Interactions

7. Data Management and Interaction

- Step 7.1: For each user action, interact with the database to update or retrieve relevant information.
- Step 7.2: Use RESTful APIs to integrate with external healthcare systems or government databases as needed (e.g., retrieving additional information or supporting AYUSH and modern healthcare interoperability).
- Step 7.3: For unstructured content (such as articles or case studies on AYUSH), use NLP and machine learning models to organize and categorize data.

Logout Process

8. Logout and Session Termination

- Step 8.1: When the user chooses to log out, terminate their session securely.
- Step 8.2: Redirect the user to the login page.

System Maintenance and Updates

9. Continuous Monitoring and Maintenance

- Step 9.1: Use CI/CD pipelines to deploy updates and improvements.
- Step 9.2: Regularly monitor the portal for performance issues and apply security patches.

End

10. Stop

This algorithm captures the main steps involved in the development and functioning of the AYUSH Startup Portal, covering registration, login, role-based access, and various functionalities provided on the platform.

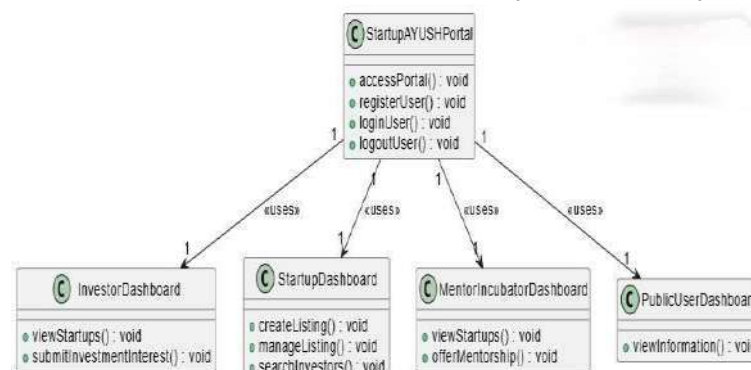


Fig.5. Algorithm for Ayush platform

VI. CASE STUDIES

Here are a few case studies and examples that highlight the impact and success of AYUSH in different areas:

1. Integration of AYUSH in Primary Healthcare in Kerala

Kerala has effectively integrated AYUSH systems, particularly Ayurveda, into its public health care system. Ayurveda is used as a complementary treatment in primary health centers, offering preventive, promotive, and curative healthcare services. The state has established over 1,200 Ayurveda dispensaries and hospitals, providing services to millions. Kerala's holistic approach combining modern and traditional healthcare has led to improved patient satisfaction and healthcare outcomes. The success of this model has inspired other states to adopt similar integration of AYUSH systems in primary healthcare.

2. Central Council for Research in Ayurveda Sciences (CCRAS)–Research in COVID-19 Management

The Central Council for Research in Ayurveda Sciences (CCRAS) initiated several research programs during the COVID-19 pandemic to evaluate the effectiveness of Ayurveda in managing and preventing the virus. Several trials involving traditional formulations such as Ashwagandha, Guduchi, and AYUSH-64 were conducted, showing promising results in boosting immunity and reducing the severity of COVID-19 symptoms. The AYUSH Ministry also issued guidelines promoting the use of Ayurveda and Yoga to improve overall health and prevent respiratory infections. This initiative helped to raise awareness about the potential of Ayurveda in modern healthcare challenges.

3. Siddha System in Tamil Nadu–Public Healthcare Outreach

The Siddha system, a traditional form of medicine from Tamil Nadu, has been successfully integrated into the state's public health outreach programs. One notable initiative is the "Siddha for All" scheme, where the government provides free Siddha medicines and consultations across rural areas. Through this program, the state addresses health conditions like arthritis, diabetes, skin diseases, and respiratory illnesses using cost-effective traditional treatments. The outreach has significantly contributed to improving health care access in underprivileged and remote regions.

4. AYUSH in Global Markets– The Success of Patanjali Ayurved

Patanjali Ayurved, an Indian company founded in 2006, is a leading example of the commercialization and global success of the AYUSH sector. The company, which manufactures Ayurveda-based products ranging from personal care items to dietary supplements, saw rapid growth both in India and internationally. By promoting natural and traditional wellness products, Patanjali has tapped into the global wellness market, contributing to the international popularity of Ayurveda. Its success highlights the economic and commercial potential of the AYUSH sector when merged with modern business practices and marketing.

5. Ayurveda's Role in Managing Chronic Diseases–Case Study of Madhavbaug Clinics

Madhavbaug Clinics, with over 270 centers across India, are known for integrating Ayurveda with modern cardiology to manage chronic diseases such as diabetes and heart conditions. The clinics offer Ayurvedic therapies combined with life style modifications and dietary management. Madhavbaug's innovative approach, including using Panchakarma therapies, has shown considerable success in reducing symptoms of chronic diseases and improving quality of life for patients. Their treatment protocols have received recognition for offering a balanced approach to health care that merges ancient wisdom with contemporary medical practices. These case studies demonstrate the diverse application of AYUSH in various sectors, from public health care and pandemic management to chronic disease treatment and global commercialization.

VII. FUTURE SCOPE

The AYUSH sector holds immense potential for future growth, both within India and globally. As healthcare systems worldwide seek sustainable, cost-effective, and holistic solutions, AYUSH's unique blend of traditional knowledge and modern science positions it as a key player in the future of global healthcare. Several areas show promise for future development:

1. Global Integration and Expansion

With rising global interest in natural and alternative medicines, AYUSH systems such as Ayurveda, Unani, and Homeopathy have the potential to significantly expand into international markets. Strategic collaborations with global healthcare organizations and governments, as well as alignment with international standards, can further elevate India's position as a global leader in traditional medicine.

2. Technological Advancements

The integration of cutting-edge technologies like artificial intelligence (AI), machine learning, and data analytics will enhance the research, diagnosis, and treatment capabilities within AYUSH. Digital health platforms, telemedicine, and personalized treatment plans can extend AYUSH's reach to a broader audience, both domestically and globally. Moreover, advancements in biotechnology can contribute to the standardization and production of high-quality AYUSH medicines.

3. Evidence-based Research and Clinical Trials Expanding clinical research and evidence-based studies will be key to gaining wider acceptance of AYUSH treatments. Rigorous scientific validation through randomized controlled trials, clinical studies, and documentation of long-term health benefits can bridge the gap between traditional systems and modern medicine. This will also help integrate AYUSH into mainstream healthcare systems globally.

4. Public-Private Partnerships and Innovation Continued support for startups and MSMEs within the AYUSH sector will drive innovation and entrepreneurship. Collaborative ventures between government bodies, research institutions, and the private sector can lead to the development of new AYUSH products, technologies, and wellness services. These initiatives can also address the rising demand for preventive healthcare solutions.

5. Education and Awareness

As consumer awareness of holistic healthcare grows, there is potential for AYUSH to take on a larger role in preventive health and wellness. Promoting AYUSH education through academic institutions and integrating it into mainstream curricula can increase its acceptance among future healthcare professionals. Public awareness campaigns focused on the efficacy of AYUSH systems in preventing and managing chronic diseases will further enhance its popularity.

6. Policy Support and International Collaboration Continued government policy support, including favorable regulations, incentives for research, and streamlined approval processes, will be vital for the sector's future growth. International collaborations with organizations such as the World Health Organization (WHO) can further standardize AYUSH practices and products, helping India lead the global traditional healthcare movement

VIII. CONCLUSION

The AYUSH sector, with its deep roots in Indian tradition and holistic approach to health, plays a crucial role in the country's healthcare landscape. The evolution of AYUSH, from a niche alternative to a growing global powerhouse, highlights its significance in providing affordable and sustainable healthcare solutions, especially in rural areas. The integration of AYUSH with modern health care systems, supported by technology and digital initiatives, has enhanced its accessibility, efficacy, and acceptance across a wider population. Government initiatives, such as the creation of the Ministry of AYUSH, the promotion of startups, and the establishment of regulatory frameworks, have propelled the sector into the main stream, enabling it to thrive both domestically and internationally. The increasing market size, combined with the growth of exports and the MSME sector, demonstrates AYUSH's potential as an economic driver. Moreover, the focus on quality control and standardization, along with research and development, ensures that AYUSH products meet global standards, further boosting consumer confidence. As AYUSH continues to expand, its role in complementing modern healthcare systems will likely become even more significant. By leveraging advancements in technology, such as artificial intelligence and data analytics, and continuing to innovate within traditional practices, AYUSH has the potential to address pressing healthcare challenges while promoting wellness on a global scale. The success of AYUSH will depend on its ability to adapt, innovate, and collaborate with conventional medical practices to create a more inclusive, holistic healthcare ecosystem.

ACKNOWLEDGEMENT

We would like to express our gratitude towards our **Dr.Prof.Vikash Signal** (Head of Department, Information Technology) for giving us this great opportunity to do a project on "Startup-AYUSH Portal (A Collaborative Platform for the AYUSH Ecosystem)". Without their support and suggestions, this paper would not have been completed.

REFERENCES

1. MoAYUSH: AYUSH Research Portal, 2021; <https://ayushportal.nic.in/>
2. Madden, R. et al., World Health Organization family of international classifications: definition, scope and purpose. World Health Organization, Geneva, 2007; <https://www.who.int/classifications/en/FamilyDocument2007.pdf?ua=1>.
3. Dee, C. R., The development of the Medical Literature Analysis and Retrieval System (MEDLARS). J. Med. Lib. Assoc., 2007, 95(4), 416–425; <https://doi.org/10.3163/1536-5050.95.4.416>.
4. Dhammi, I. K. and Haq, R. U., What is indexing. Indian J. Or-thop., 2016, 50(2), 115; <https://doi.org/10.4103/0019-5413.177579>.
5. Boehm, K., Raak, C., Vollmar, H. C. and Ostermann, T., An over-view of 45 published database resources for complementary and alternative medicine. Health Inf. Lib. J., 2010, 27, 93–105; <https://doi.org/10.1111/j.1471-1842.2010.00888.x>.
6. Narahari, S. R., Aggithaya, M. G. and Suraj, K. R., Conducting literature searches on Ayurveda in PubMed, Indian, and other databases. J. Altern. Complement. Med., 2010, 16, 1225–1237.
7. Manohar, P., Eranezhath, S., Mahapatra, A. and Manohar, S., DHARA: Digital Helpline for Ayurveda Research Articles. J. Ayurveda Integr. Med., 2012, 3, 97; <https://doi.org/10.4103/0975-9476.96530>.
8. Sala, A. V., Aryavaidyan, 2021; <https://www.worldcat.org/title/aryavaidyan/oclc/20697862>.
9. Wang, J., Guo, Y. and Li, G. L., Current status of standardization of traditional Chinese medicine in China. Evid.-Based Complement. Altern. Med., 2016, 2016, 1–7; <https://doi.org/10.1155/2016/9123103>.
10. Chaudhary, A. and Singh, N., Contribution of World Health Organization in the global acceptance of ayurveda. J. Ayurveda Integr. Med., 2011, 2, 179; <https://doi.org/10.4103/0975-9476.90769>.
11. MoAYUSH: National AYUSH Morbidity and Standardized Terminologies Portal (NAMASTE Portal), 2021; <http://namstp.ayush.gov.in/#/index>.
12. Bramer, G. R., International statistical classification of diseases and related health problems. Tenth revision. World Health Stat. Q., 1988, 41, 32–36.
13. WONCO: International classification of primary care, World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians, 2021; <https://www.globalfamilydoctor.com/site/DefaultSite/filesystem/documents/Groups/WICC/InternationalClassificationofPrimaryCareDec16.pdf>
14. World Health Organization, General guidelines for methodologies on research and evaluation of traditional medicine, 2000; https://apps.who.int/iris/bitstream/handle/10665/66783/WHO_EDM_TRM_2000.1.pdf?sequence=1&isAllowed=y.
15. MoAYUSH: Ayush Hospital Management Information System, 2021; <http://ehr.ayush.gov.in/ayush/>.

16. SIH, "Smart India Hackath on <https://www.sih.gov.in/sih2023PS> Nov,2023).
17. Kaushik, Chattopadhyay.(2020).Globalizations of Ayurveda: Importance of Scientific Evidence Base.3-7. https://doi:10.1007/978-981-13-7248-3_1.
18. Harilal, Madhavan.(2014).InnovationSystemand Increasing Reformulation Practices in the Ayurvedic Pharmaceutical Sector of South India. Asian Medicine, 10.1163/15734218-12341330. 9:236-271. doi:
19. A.D.A.D.S., Jayalath., P.V.D., Nadeeshan., T.G.A.G.D, Amarawansh., H.P, Jayasuriya., Dasuni, Nawinna. (2019). Ayurvedic Knowledge Sharing Platform with Sinhala Virtual Assistant. <https://doi:10.1109/ICAC49085.2019.9103413>.
20. Anjali, M., Bakshi., Tushita, Thakur. (2022). The initiative of AYUSH Wellness Centre, President Estate: Impact, experiences, and future recommendations. International Journal of Ayurveda Research, 3(1):44-47. https://doi:10.4103/ijar.ijar_15_22.
21. Perspectives on Ayush Sector: Innovations for Future Integrative Health Systems. <https://doi:10.31219/osf.io/ymjx2>
22. Olfn, Khuh, Wr, Grzqordg., luhh, \$, Qgurlg, Dssolfdwlrq, lru.(2014).Envisioning AYUSH: Historic Opportunity for Innovation and Revitalization.
23. A., V., Aswin., K., Y., Basil., Vimal, P., Viswan., Basil, Reji., Bineeth, Kuriakose. (2020). Design of AYUSH: A Blockchain-Based Health Record Management System. 665- 672. https://doi:10.1007/978-981150146-3_62.
24. Jyoti, Kanjalkar., Pramod, Kanjalkar., Tanmay, Deshmukh., Jay, Deshmukh., Pratik, Dhamal., Apurva, Bhalerao. (2022). A Novel System for AYUSH
25. Healthcare Services using Classification and Regression. International Journal on Recent and Innovation Trends in Computing and Communication, 10(1s):232-240. 10.17762/ijritcc.v10i1s.5830. doi: