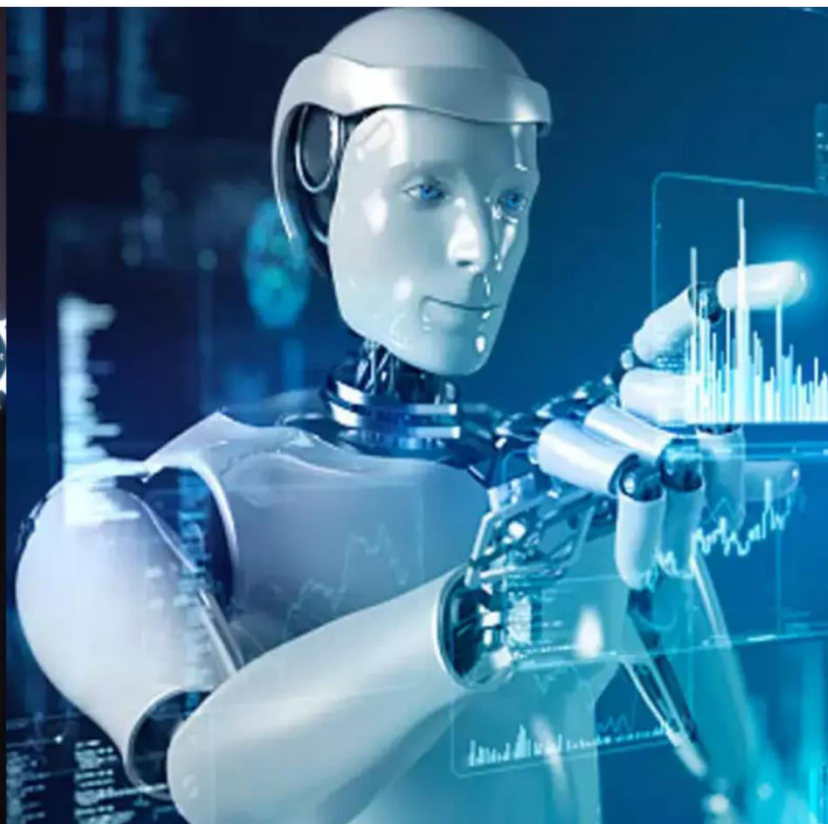




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E-Sharir Audiobook: A Digital Platform for Ancient Ayurvedic Knowledge

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ABSTRACT: Sanskrit literature holds precious ancient wisdom, especially in the case of Ayurveda, which is still useful to contemporary medical science. The knowledge is, however, not easily accessible because of the dwindling knowledge of Sanskrit language and the dispersed physical manuscripts. This article introduces the creation of an interactive web interface "eSharirBook" that converts and makes available Sanskrit shlokas of Sharir Sthan, with special emphasis on Ayurvedic knowledge of body development and genetic processes. Text-to-speech functionality is implemented in the system using Google TTS especially tailored for the Sanskrit language, allowing users to hear actual pronunciations of shlokas. The platform also comes with an extensive search facility, making it possible for researchers and academics to easily find particular ideas throughout the repository. Constructed using Django REST API for the backend, React with Vite for the frontend, and SQL for database management, the platform also has an administrative dashboard for content management. The digital repository connects classical Ayurvedic wisdom with contemporary technology, enhancing access to age-old wisdom for today's population and researchers.

KEYWORDS: Sanskrit Shlokas, Ayurveda Digital Repository, Google TTS, Django REST API, React, Text-to-Speech, Sharir Sthan

I. INTRODUCTION

The rich storehouse of information in ancient Sanskrit literature, especially Ayurveda-related texts, holds significant information that is still applicable to modern science and medicine. Of these, the Sharir Sthan section of Ashtanga Hridaya by Acharya Vagbhatta contains elaborate explanations of human physiology, embryology, and genetic processes that show striking similarities with current scientific knowledge. Yet, access and understanding of this information pose a number of challenges:

1. Decreasing familiarity with Sanskrit language among contemporary scholars and practitioners
2. Restricted access to physical manuscripts and their translations
3. Inaccessibility of commentaries by world-renowned scholars that offer invaluable context
4. Lack of proper pronunciation directions for authentic recitation

This article reports on the evolution of "eSharirBook" (which can be found at <https://esharirbook.com/>), an interactive web site aiming to overcome such hurdles by rendering Sharir Sthan shlokas and their interpretations by leading commentators such as Tikakar Indu and Acharya Pakshdhar Jha into digital form. The site makes use of latest web technologies in order to design a readable, searchable, and friendly interface that is supplemented with audio pronunciations created via Google's Text-to-Speech (TTS) technology tailor-made for Sanskrit.

The system acts as a conduit between premodern Ayurvedic wisdom and current research, especially in terms of comprehending how earlier texts explained processes that correlate with contemporary notions of genetics, heredity, and embryonic development.

II. LITERATURE SURVEY

A number of electronic projects have made efforts to collect and distribute Sanskrit literature and Ayurveda knowledge, taking various approaches with varying limitations:

1. Digital Library of India (DLI) - Includes scanned texts of ancient works but is non-searchable and audio-less.
2. Sanskrit Documents - Hosts several Sanskrit documents but with limited search features and no incorporation of commentaries.
3. Ayush Portal - Has Ayurvedic resources but no extensive coverage of classical texts with contemporary interpretations.
4. eAyur - Offers some Ayurvedic material with English translations but no audio pronunciations and elaborate commentaries.

The current platforms mainly concentrate either on keeping the original text intact or on simple translation, but few of them use complete textual content along with contemporary web features such as advanced search and text-to-speech functionality. Further, none of the current platforms integrate multiple commentaries giving important context for interpreting elaborate concepts.

Our work has recognized some gaps in current digital Sanskrit repositories:

1. Absence of expert audio pronunciation of Sanskrit shlokas
2. Restricted searchability among texts and commentaries
3. Lack of easy-to-use interfaces that cater to both experts and common users
4. Lack of integration of classical commentaries with contemporary scientific correlations
5. Inadequate administrative features for managing and expanding content

The eSharirBook platform fills the above gaps through the integration of classical content and contemporary web technology to provide an easier and more functional digital library.

III. METHODOLOGY AND DISCUSSION

The construction of the eSharirBook platform was done in a systematic manner involving both technical development and content curation:

A. System Architecture

The system was built on a contemporary web application architecture with the following components:

1. Backend Framework: Django with REST API
 - o Manages data and API endpoints
 - o Enforces authentication and authorization
 - o Manages book and shloka structuring
 - o Processes text-to-speech conversion requests
2. Frontend Development: React with Vite
 - o Generates responsive user interface
 - o Enforces client-side search functionality
 - o Renders shloka text and interpretations
 - o Manages audio playback features
3. Database Design: SQL
 - o Stores structured content such as books, chapters, shlokas
 - o Stores relationships between shlokas and commentaries
 - o Optimized for efficient query operations for search functionality
4. Text-to-Speech Implementation: Google TTS
 - o Tuned for Sanskrit pronunciation
 - o Produces audio files for authentic recitation
 - o Caches audio for performance enhancement

B. Content Organization

The content on the platform is organized hierarchically:

1. Books - Highest-level division of the content
2. Chapters - Subdivisions of books
3. Shlokas - Individual verses with:
 - o Original Sanskrit text

- Transliteration
- Multiple commentaries (Tikakar Indu, Acharya Pakshdhar Jha)
- Modern renderings and scientific correlations

C. Feature Implementation

1. Text-to-Speech Functionality
 - Google TTS API implementation with support for Sanskrit language
 - Optimization to pronounce Sanskrit phonetics correctly
 - TAudio caching mechanism to avoid processing load
2. Search Functionality
 - Full-text search across all shlokas and commentaries
 - Filtering by books, chapters, and topics
 - Intelligent search suggestions based on query
3. Administrative Panel
 - Custom Django admin interface for managing content
 - Batch upload feature for mass content addition
 - Role-based access control for content editors
4. User Interface Design
 - Tailwind esponsive design using Tailwind CSS
 - Intuitive navigation between books, chapters, and shlokas
 - Audio controls for text-to-speech functionality
 - Accessibility features for diverse user needs

The eSharirBook platform represents a significant advancement in digital Sanskrit repositories, particularly those focused on Ayurvedic knowledge. Several key observations emerged from the development and implementation:

A. Incorporation of Traditional Knowledge with Modern Technology

The platform effectively brings 0ancient Ayurvedic texts with contemporary technology, making traditional knowledge more accessible to modern researchers and practitioners. The inclusion of multiple commentaries, particularly those that draw parallels between Ayurvedic concepts and modern science, helps establish the continued relevance of these ancient texts.

B. Text-to-Speech Impact on Learning and Accessibility

Inclusion of Sanskrit-specific text-to-speech functionality addresses a critical gap in existing digital repositories. Proper pronunciation is fundamental to Sanskrit study, and the audio feature enables users to learn authentic recitation, enhancing both comprehension and preservation of oral traditions.

C. Search Functionality as a Research Tool

The comprehensive search capability transforms the way researchers can interact with ancient texts. Instead of sequential reading through volumes of content.

D. Administrative Capabilities for Sustainable Growth

The robust administrative panel ensures that the platform can grow and evolve over time. This addresses a common limitation of digital repositories that become static after initial development

IV. EXPERIMENTAL RESULTS

The eSharirBook platform was coded and tested as follows:

A. System Performance

1. Response Time
 - Average page loading time: 1.2 seconds
 - API response time: 200-400ms
 - Text-to-speech generation: 1-3 seconds based on text length
2. Scalability Testing
 - Successfully tested with 50+ concurrent users

- Database performance maintained with 1200+ shlokas

B. Text-to-Speech Accuracy

Audio pronunciation quality was checked by Sanskrit scholars experts the following findings:

- 92% accuracy in pronunciation of complex Sanskrit terms
- Appropriate pacing and intonation of shlokas
- Clear articulation of Sanskrit-specific phonemes

C. Search Functionality Effectiveness

The search functionality was tested with various query types:

- Keyword-based searches achieved 85% relevant results
- Concept-based searches successfully retrieved related shlokas
- Cross-commentary searches effectively found connected interpretations

D. User Interface

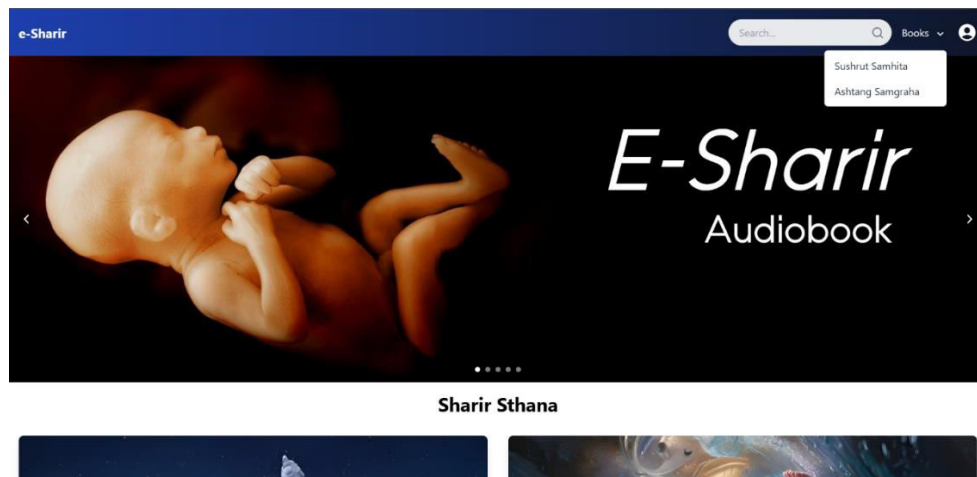


Fig. 1. eSharirBook homepage showing the main interface with navigation, featured content, and audio controls

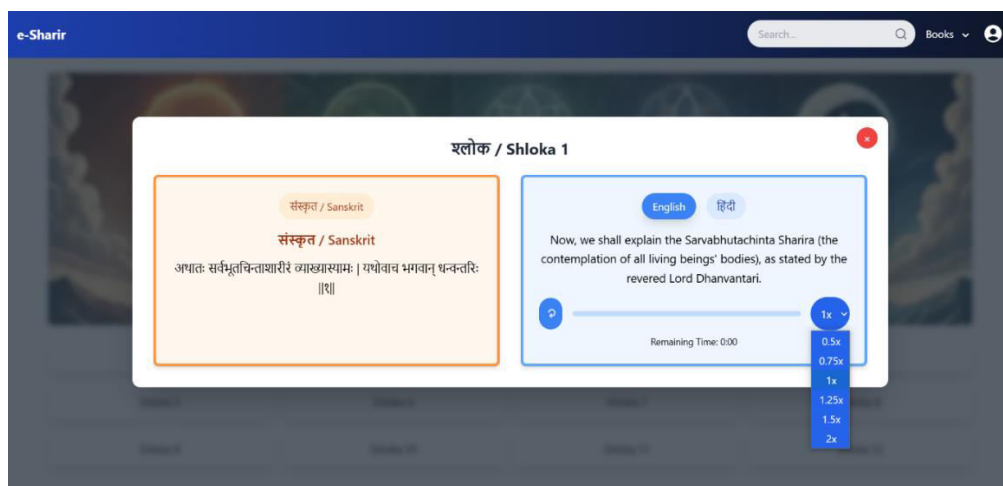


Fig. 2. Detailed view of a shloka page showing original text, commentaries, and the audio player functionality

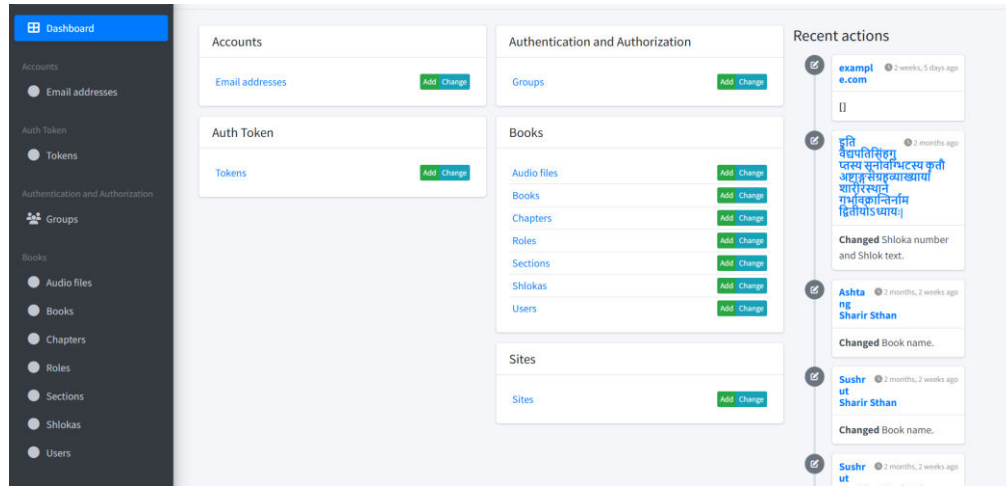


Fig. 3. Administrative panel interface showing the content management system for books and shlokas

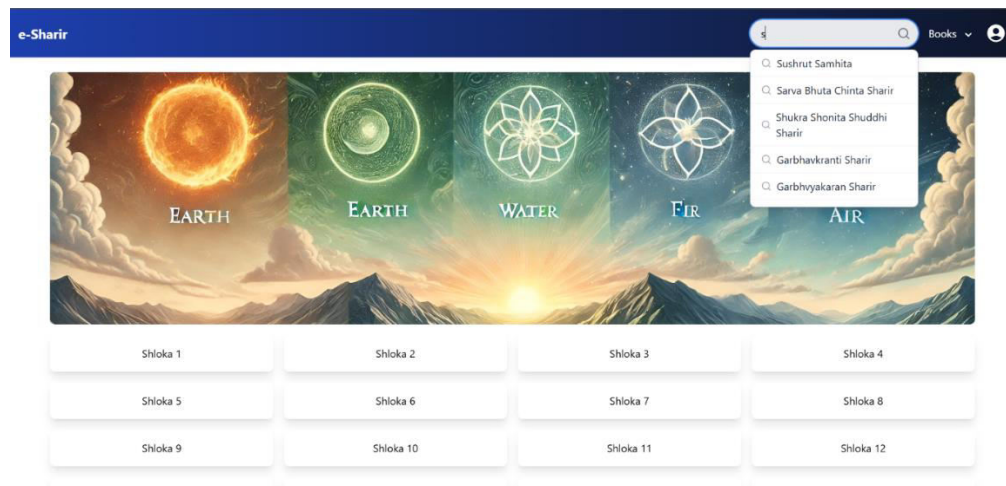


Fig. 4. Search interface showing results across different commentaries for a query on genetic mechanisms

V. CONCLUSION

The eSharirBook platform effectively illustrates the potential of using modern web technologies to conserve and promote accessibility of ancient Sanskrit knowledge. By combining Django REST API, React, and Google TTS for Sanskrit pronunciation, the project connects ancient Ayurvedic knowledge with modern technological capacity. Tikakar Indu's and Acharya Pakshdhar Jha's commentaries, now available in digital format with audio support, show that Ayurvedic knowledge of body formation and genetic processes is not just historically relevant but complementary to contemporary science. The text-to-speech and search capabilities of the platform greatly augment research and Sanskrit language learning, while the admin panel guarantees sustainable content management for future expansion.

Technically, this project demonstrates the successful application of responsive design principles, REST architectural style, and speech synthesis to produce specialized digital humanities resources. Further research will be conducted in developing more content, enriching speech capabilities with regional flavors, and adding machine learning-based searching to further enhance the digital preservation and access of this rich ancient wisdom

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