2026

Standardization and Validation of Revised Bharati Braille for Technological Integration

Draft Project Report

Clarification

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Finally, we recognize the unwavering commitment of educators, technologists, and advocates who continue to advance inclusive education and digital accessibility for persons with visual disabilities.

(Pradeep A.)
Director, NIEPVD

Executive Summary

Bharati Braille—India's unified Braille system—was first standardised in **1951** to harmonise multiple regional Braille scripts into a common national framework. Building on decades of development and field practice, NIEPVD, under the guidance of the **Braille Council of India (BCI)**, prepared a revised manual of Bharati Braille (published in November–December 2024), and on **4 January 2025** DEPwD and NIEPVD jointly released the **Standard Bharati Braille Codes**, fully mapped with Unicode for digital compatibility.

For clarity, this project adopts the following versioning convention:

- **Bharati Braille 1.0** — the national standard established in **1951**.
- **Bharati Braille 2.0** — the **4 January 2025** release of updated **Standard Bharati Braille for 9 scripts covering 13 Indian languages.**

NIEPVD has initiated implementation of updated Bharati Braille Standards across teaching–learning contexts and technology platforms, including integration efforts with **Liblouis**, the widely used open-source Braille translation library. Forward-translation (print → Braille) validation has been completed through multi-site focal group discussions; backward-translation (Braille → print) validation is scheduled for the next phase.

Draft Bharati Braille 2.1 has been prepared with updated Standard Bharati Braille for 9 scripts covering 13 Indian languages, adding example words for all alphabets and braille translation rules for forward translation. The improvements for each language were compiled during the project on validation of Liblouis tables for Indian languages and focal group discussions. This Draft **Bharati Braille 2.1** may be released by NIEPVD after public consultation in January 2026.

Background and Rationale

Upon gaining independence in 1947, India faced so many challenges on different sociological, political and economic fronts. One unique challenge was also there in the context of standardising Braille for its linguistically diverse population. At that time, nearly eleven different regional Braille codes were in use, each adapted to local scripts such as Devanagari, Bengali, Tamil, Gujarati, and others. This multiplicity created significant barriers for visually impaired learners, as moving between states or accessing educational material in different languages required learning multiple Braille systems. Recognizing this issue, the Government of India and experts initiated efforts to unify these codes. The Central Advisory Board of Education appointed committees in the early 1940s, and after extensive consultations and field testing, a uniform system was finalized. In 1951, these efforts culminated in the adoption of Bharati Braille - a single national standard designed to represent the phonetic structure of Indian languages while maintaining compatibility with the international Braille framework. This standardization was not only a technical achievement but also a social milestone, enabling the production of educational materials, official documents, and literature in multiple languages under one system. Over time, Bharati Braille became the cornerstone of inclusive education in India. The system has continued to evolve, incorporating Unicode mapping and adapting to modern technologies such as Braille translation software and digital embossing, ensuring accessibility and uniformity for millions of users across the country. Over time, NIEPVD (formerly NIVH) has led improvements and capacity-building, and other Braille development activities.

The Braille Council was also came into existence by NIEPVD and a series of meetings and efforts were made for uniformity and inclusivity, culminating in the **Manual of Bharati Braille (Dec, 2024)** as a precursor to the new codes.

On **World Braille Day** (4 Jan 2025), DEPwD and NIEPVD released **Standard Bharati Braille** to ensure cross-platform digital interoperability and consistency across scripts (Devanagari, Bangla, Gujarati, Gurmukhi, Kannada, Malayalam, Odia, Tamil, Telugu). This followed a public consultation on the **Draft Standard Bharati Braille Codes with Unicode Mapping Chart** in December 2024.

Objectives

1. **Validate** forward and backward translation for education, publishing, and assistive technology workflows.
2. **Integrate** Standard Bharati Braille with the open-source translation library (**Liblouis**) to enable support for Indian languages in Braille products (such as Braille translation Software and Refreshable Braille Displays).
3. **Implement** validation outcomes to improve and update in Bharati Braille Standard.

Scope and Definitions

- **Languages:** Following Indian languages has been considered in this project for validation of Liblouis tables for forward translation:
  - Hindi, Sanskrit, Marathi, Nepali (Devanagari);
  - Assamese, Bengali (Bangla);
  - Odia;
  - Gujarati;
  - Punjabi (Gurmukhi);
  - Kannada;
  - Malayalam;
  - Tamil;
  - Telugu
- **Versioning:** 1.0 (1951); 2.0 (Jan 2025); draft version 2.1 (proposed in January, 2026)
- Draft Bharti Braille 2.1 includes Further improvements and updates based on validation of Liblouis tables of Indian languages covered in Bharati Braille 2.0.
- Liblouis tables for Indian languages have been prepared to build support for Indian languages braille in various **products and apps such as,** Embossers, refreshable Braille displays, screen readers, and braille translation software.

Methodology

Design for Standards Development and Consultation

Validation of Standard Bharati Braille Codes through local liblouis table updates with validators

Focal Group Discussions with Validators

Compilations of error reports and suggestions of standard and rules for forwa

Preparation of Indian language Liblouis tables to ensure their compatibility with Bharti Braille 2.0. for forward translation

Validation & Discussion Workshops

Four Workshops were organised for validation and focal group discussions:

Sl.	Dates	Place	Area of Discussion / Validation
1	01-02 September 2025	Saksham, New Delhi	Validation of Devanagari (Hindi, Sanskrit, Marathi, Nepali) and Gujarati Braille and discussion
2	17-18 October 2025	CRC, Kozhikode, Kerala	Validation of Malayalam, Tamil, Telugu and kannada Braille and discussion
3	23-24 November 2025	IIC, Jatni, Khurda, Odisha	Validation of Bangla, Odia and Assamese Braille and discussion
4	22-26 December 2025	Saksham, New Delhi	Forward translation revalidation and Preparation of Draft Document

Testing and Validation

- **Forward Translation Validation** (print → Braille):
  - Development of **language-specific tables** and test sheets.

- ○ **Focal Group Discussions (FGDs)** in multiple regions to validate dot patterns against orthographies and usage conventions.
  - ○ Expert consensus is captured and reflected in tables and examples.
- **Preparation and Validation** of Indian language Liblouis tables for backward translation (Braille → print):
  - ○ Scheduled next phase; will include script-specific tests and device/software tests.
- **Technical Benchmark Testing:** Braille typing using various braille input methods and their translation to mainstream script.

Deliverables

1. **Bharati Braille 2.1 –** containing code charts mapped to Unicode with example words for 13 indian language.
2. **Validated Indian Language Tables for Forward Translation for Liblouis –** compatible with Bharati Braille 2.1

Future Roadmap

1. **Implement Backward-**Translation for Indian languages for the open-source Braille translation library (Liblouis);
2. Extending Bharati Braille standard for remaining Indian languages
3. **Comprehensive Formatting Guidelines**
4. **Adoption of UEB for English Braille in India with Bharati Braille**
5. **National Training Rollout** for educators, producers, and software teams; establish refresher modules and certification pathways.

References

- **Manual of Bharati Braille** (Dec 2024), NIEPVD [cdnbbsr.s3…aas.gov.in]
- **Press Information Bureau (PIB)** release: Launch of **Standard Bharati Braille Codes** on **4 Jan 2025**. [pib.gov.in]
- **DEPwD** Draft: Standard Bharati Braille Codes with Unicode Mapping (Dec 2024) — Public consultation. [depwd.gov.in]
- **Liblouis**: Bharati Braille specifications (hosting of codes/specs), tables repository. [liblouis.io], [github.com]
- **Bharati Braille (1951 standardization, historical notes)**

Annexures

1. Bharati Braille **2.1** (standard of Braille for Indian Languages)
2. Validated Indian Language Tables for Liblouis