Proposal for Encoding of Vaidika Character & Symbols in Unicode

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The Draft Proposal dated 10th October 2007 is prepared by Prof. R. K. Joshi, Dr. Alka Irani and her team of LCG, C-DAC Mumbai and in collaboration with Scholars, for Department of Ministry of Communications & IT, Government of India; for consideration and submission to Unicode Technical Committee.

Opening remarks:


This draft proposal has been discussed and consolidated with the help of many Vedic Sanskrit scholars, Sanskrit academicians, linguists, technologists from various academic research institutions and Government of India officials. Their valuable contributions are duly acknowledged.

In this present draft proposal 79 character codes have been identified under the block entitled Vaidika extensions and requested for its inclusion in the suitable slot in the BMP of UCS. 79 characters include 2 Vowel Letters, 2 Vowel Maatra signs, 3 Consonant Letters that are needed for Vedic Sanskrit text as well as for Indo-Iranian Avesta text using Devanagari script. Under Vaidika extensions, 23 Swaraadi Chihnas, 20 Vaidika Svaraankana Chihnas, 25 Vaidika Saamasvara Chihnas and 4 Vaidika Symbols and Chihnas have been identified.
Introduction

The ancient holy text in India is known by the name of the Veda. The word Veda is derived from the root verb “vid” - to know, to attain the knowledge. There are 4 Vedas namely RigVeda, YajurVeda, SaamaVeda and AtharvaVeda. Composed in verse format using Sanskrit language, the contents of these Vedas are of spiritual, philosophical and practical nature and are to be vocalized in terms of recitation, chanting, singing, etc. The collections of the Mantras (the compositions in poetry and prose form) of the four Vedas were further divided into Shaakhaas (branches). The classes of reciters known as Vaidikas belonging to individual branches have retained their chanting characteristics while vocalizing the Mantras. This oral mode acquired a great significance in ancient India in terms of Teacher-students tradition (guru-shishya paramparaa). At later stage such oral recitations had to be written down by Pandits in order to retain the knowledge in the written mode. To write such Vedic text with vocal nuances, various signs (svaraankana-paddhati) were devised and placed around syllables. These are called Vedic accent and tonal signs. It is interesting to note that a single chant if vocalised by the Vaidikas of different branches, would have slight variation in terms of nasalization, intonation, continuum, stress etc. And to indicate these differences, many variants of a single sign have been developed. For example, there are 15 variations of Anusvaara indicated by 15 graphic signs with slight variations in their visual forms. The selective usage of these signs indicates that the particular text is from a particular branch of Veda.

It is observed that there is a Vaidika tradition of hand movements (Hasta-Mudraas) to suggest the proper way of intonation while chanting the Mantras.

Sanskrit is one of the most ancient languages of the world, which has moulded the culture and the thought systems not only of India but also of many other countries in Asia. Sanskrit is not a dead language. Sanskrit was for over a millennium, a living spoken language with a considerable literature of its own. Besides works of literary value, there was a long philosophical and grammatical tradition.

Many Universities in India and abroad are involved in the Vedic studies as a specialized subject. Traditional Vaidika Paathashaalaas in various parts of India are involved in imparting the practice and knowledge of Vaidika oral tradition. Temples and Mathas are providing support for learning and teaching Vedic texts. Various research institutes are actively involved in bringing out critical editions of the Vedic texts and various research activities in this field.

1. The range of Vedic texts

The Vedic texts refer to the four groups of Vedas namely RigVeda, YajurVeda (Shukla and Krishna), SaamaVeda and AtharvaVeda. The range of Vedic texts extend to their respective Shaakhaas, Upashaakhaas (branches-subbranches),
Samhitaas, Braahmannas, Aarannyakas, Upanishads, Shrautasuutras, Praatishaakhyas and Shikshaas. Originally, the Vedic text (mostly in verse form) – Samhitaas along with their respective Padapaathas exist in the oral mode and were passed on from Guru to Shishya through various processes such as Shravanna (listening), Anuchchaaranna (repetition), Arthabodha (understanding of the meaning), Kannthasthiikaranna (memorisation), Charchaa-Samvaada (discussion) and Prashnottara (Questions &Answers).

Later on when these texts were written (with appropriate methodologies and materials, the need was felt to introduce Vaidika Svaraankana Chihnas (accent/tonal marks, signs and symbols) as a guide for proper pronunciation (and hence proper reading) of such texts.

The Shikshaas cover the study of the terms such as Varna (letters of alphabet), Svara - (accents like Udaatta, Anudaatta and Svarita), Maatraa (the time measurement required for the pronunciation), Bala (stress - in context to sthaana and prayatna) etc.

The Praatishaakhyas constitute studies on phonetics, which prevailed in ancient India in different schools of the Vedas. Each Praatishaakhya with the ancient phonetic system was applicable to a particular school of each Veda. Some of the Praatishaakhyas such as Taittiriya covered subjects like Uchchaaranna-kalpa - formation of articulate sounds and more of their production.

2. Vaidika texts with Svaraankana Chihnas

One of the most significant characteristics of Vedic language is its proper accentuation system in utterances of its words, sentences as well as prose and versified compositions.
Vedic text with Svaraankana Chihnas is available in various groups of Vedic literature such as Samhitaas, Braahmannas, Aarannyakas and Upanishads. Besides, various Pratishaakhyas and Shikshaagranthas have discussed the theoretical as well as grammatical and practical aspects of `Uchchaaranna' (accentology) supported by examples of Svaraankana Chihnas (accentography) as well as their contextual rules.

Various branches of RigVeda, YajurVeda, SaamaVeda and AtharvaVeda are marked with `Svaras'. It is observed that the Vedic text and its accent marks vary in their application and presentation as per its branch, sub-branch, tradition and location.

For example:
In RigVeda, the Udaatta Svara is left unmarked. In Rigveda and YajurVeda the Svarita Svara is marked with short vertical line on the top of a syllable. The same sign appears as Anudaatta mark below a syllable in AtharvaVeda (Paippalaada Shaakhaa).

3. The importance of Svaraankana Chihnas

Svaraankana Chihnas are very useful devices in more than one way. On one hand these marks represent nuances of pronunciation and on the other hand these marks are used for semantic differentiation as well.
3a. *Svaraankana Chihnas* are used in each *Pada* (word) as to help to understand the proper meaning (*Arthabodha*) of a *Mantra*.

3a.1 The knowledge of the kind of *Samaasapada*

- The killer of *Indra*
  *Tatpurusha samaas*

- The one for whom *Indra* is an enemy
  *Bahuvrihi samaas*

3a.2 For Gender classification

- Adjective, Feminine Gender

- Adjective, Masculine Gender

3b *Svaraankana Chihnas* are useful in context of deciding the grammatical status of a *pada*.

- Noun

- Adjective

3c *Svaraankana Chihnas* are used in context to sentence classification. Some words in a sentence are accented and some are not, creating the correct meaning.

3c1. The verb in the principle clause is unaccented whereas in the subordinate clause it is accented.

3c2. In a given sentence, if a speaker does not give any stress on the *pada*, then it is marked as a *Sarvaanudaatta*. Whereas, if a speaker wants to give a stress in the beginning of the word then that is accented.
3c.3 If there is a concept of addressing someone (vocative) in the beginning of a sentence then the first syllable of the *pada* will be accented.

4. The Contextual aspect of Svaraankana Chihnas

The *Svaraankana Chihnas* of Vedic Sanskrit are not independent signs. They do not behave as punctuation marks. The *Svaraankana Chihnas* are positioned all around the syllable. Some of them are of zero width and some have positive widths. However these marks with positive widths cannot be termed as letters. Most of these marks are dependent on the context i.e. preceding syllable and or following syllable. Further these positive width marks can take zero width marks above or below of them and are governed by linguistic rules as per grammar.

4.1 In *Samhitaa* text and in the *Padapaatha*, different signs are noticed in case of the same *pada*. (Vaajasaneyi Maadhyandina Shukla YajurVeda Samhitaa pg102/5.27).

- *Samhitaa*

- *Padapaatha*

4.2 Vedic *Anusvaara*, when it occurs in the *Samhitaa* is affected by the pronunciation of the subsequent sound. When *Samhitaa* is split into *padapaatha*, due to the pause that follows after the *Anusvaara*, the *Anusvaara* sounds differently so it is shown with two different signs in the *Samhitaa* and *Padapaatha*.

- *Samhitaa*

- *Padapaatha*

Here the *Anusvaara* is changed to `M` in the *Padapaatha*. Vaajasaneyi Maadhyandina Shukla YajurVeda Samhitaa (pg106/5.35).

4.3 The *Anusvaara*, which is inside the *pada* remains as it is. This *Anusvaara* is not caused by any factor outside of that word itself, but is there in the process of the formation of the *pada*. 
All these and similar cases of an Svaraankana Chihna are appropriately reflected in the property data provided in this draft proposal.

5. The identified range, positioning and compositions of Svaraankana Chihnas

5a. The total number of 32 Vedic Sanskrit signs were identified in the 'Extended character set for Vedic' in the ISCII document Annex-G (IS13194: 1991). The extension character (EXT), defined in ISCII, was to be followed by another character in the range of A1 Hex to EE Hex, to yield additional 32 characters needed for Vedic Sanskrit text with such accent marks.

5b. The codes for 42 Vedic signs were provided in the Vividha codes while enabling Vedic Sanskrit text at the National Centre for Software Technology (Formerly NCST, now CDAC Mumbai), Bombay in 1985.

5c. The Task was undertaken at NCST in Aug 2000, to identify the full range (as used) of Vedic Sanskrit accent marks. The identified 66 signs were divided into 6 groups as follows:

- **Group A** - Vedic signs appearing at the top of a syllable
- **Group B** - Vedic signs appearing below the syllable
- **Group C** - Vedic signs, indicating vibration
- **Group D** - Vedic signs - Visarga appearing in the linear way after a syllable
- **Group E** - Vedic signs - Anusvaara appearing in the linear way after a syllable
- **Group F** - Vedic signs - Misc. appearing in the linear way-after a syllable

5d. Further, the additional Vedic accent signs (Svaraankana Chihnas) were observed from various sources-manuscripts/printed texts.

These signs were discussed and debated regarding their multiple usages, redundancies, earlier technology restraints, multiple shapes and usability factors. From the total of identified 102 Vedic signs, the codes
for 79 Vedic signs have been chosen and recommended as candidates for Unicode in this draft proposal.

One of the Shaakhaas viz. Jaiminiya, have different system of syllables to be used as accent marks. These marks need to be handled through a separate soft tool.

6. The compositional rules

The Vaidika Swaraadi Chihn, Vaidika Svaaankana Chihn, Vaidika Saamasvara Chihn are to be rendered above, below and/or right side of the syllable.

The types of Svaaankana Chihn and their compositional rules are given separately

7. The help in preparation of this draft proposal from all quarters is gratefully acknowledged.
# Proposal for Encoding of Vaidika Character & Symbols in Unicode

## Vaidika Extensions

(15th August 2007) C

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<thead>
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<th>Symbol</th>
<th>Description</th>
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### Vaidika Svaraankana Chihna

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**Vaidika Chihna**

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Unicode Data Properties

0880; INDO IRANIAN AVESTA LETTER SAREKA CANDRA LONG A; Lo; 0; L;;;;; N;;;;;
0881; INDO IRANIAN AVESTA VOWEL SIGN SAREKA CANDRA LONG A; Mn; 230; NSM; ; ; ; ; ; ;
0882; INDO IRANIAN AVESTA LETTER LONG AAOO; Lo; 0; L;;;;; N;;;;;
0883; INDO IRANIAN AVESTA VOWEL SIGN LONG AAOO ; Mc; 0; L;;;;; N;;;;;
0884; INDO IRANIAN AVESTA LETTER ZH; Lo; 0; L;;;;; N;;;;;
0885; VAI DIKA LETTER YY; Lo; 0; L;;;;; N;;;;;
0886; VAI DIKA LETTER LLH; Lo; 0; L;;;;; N;;;;;
0889; VAI DIKA ANUSVAARA CANDRA TIRYAK ; Mc; 0; L;;;;; N;;;;;
088A; VAI DIKA ANUSVAARA CANDRA SADVI ; Mc; 0; L;;;;; N;;;;;
088B; VAI DIKA ANUSVAARA CANDRA SATRI; Mc; 0; L;;;;; N;;;;;
088C; VAI DIKA ANUSVAARA CANDRA SAAVAGRAHA; Mc; 0; L;;;;; N;;;;;
088D; VAI DIKA ANUSVAARA DVI CANDRA TIRYAK; Mc; 0; L;;;;; N;;;;;
088E; VAI DIKA ANUSVAARA ANTARMUKHA; Mc; 0; L;;;;; N;;;;;
088F; VAI DIKA ANUSVAARA VAAMAMUKHA; Mc; 0; L;;;;; N;;;;;
0890; VAI DIKA ANUSVAARA VAAMAMUKHA SACANDRA; Mc; 0; L;;;;; N;;;;;
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0892; VAI DIKA ANUSVAARA DAKSHINNAMUKHA; Mc; 0; L;;;;; N;;;;;
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0897; VAI DIKA ANUSVAARA DVI BINDU AVAGRAHA; Mc; 0; L;;;;; N;;;;;
0898; VAI DIKA VI SARGA MADHYEREKHA; Mc; 0; L;;;;; N;;;;;
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089C; VAI DI KA VI SARGA DAKSHINNATAH UURDHVA VAKRA; Mc; 0; L;;;;; N;;;;;
089D; VAI DI KA VI SARGA VAAMATAH ADHO VAKRA; Mc; 0; L;;;;; N;;;;;
089E; VAI DI KA VI SARGA JIHVAAMULIYA VAJRA; Mc; 0; L;;;;; N;;;;;
089F; VAI DI KA UPA DHAMAAANIYA GAJAKUMBHA; Mc; 0; L;;;;; N;;;;;
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08A1; VAI DI KA SVARITA ADHO DVI REKHA; Mn; 220; NSM; ; ; ; ; ; ;
08A2; VAI DI KA SVARITA DVI VAKRA KHANDA; Mc; 0; L;;;;; N;;;;;
08A3; VAI DI KA SVARITA UURDHVA SHARA ; Mn; 230; NSM; ; ; ; ; ; ;
08A4; VAI DI KA SVARITA UURDHVA DVI REKHA; Mn; 230; NSM; ; ; ; ; ; ;
08A5; VAI DI KA SVARITA UURDHVA TRI REKHA; Mn; 230; NSM; ; ; ; ; ; ;
08A6; VAI DI KA SVARITA ADHAH ARDHA VAKRA; Mn; 220; NSM; ; ; ; ; ; ;
08A7; VAI DI KA SVARITA ADHO NYUBJA; Mn; 220; NSM; ; ; ; ; ; ;
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08AD; VAI DI KA SVARITA ADHO DVI BINDU; Mn; 220; NSM; ; ; ; ; ; ;
08AE; VAI DI KA SVARITA ADHAS TRI BINDU; Mn; 220; NSM; ; ; ; ; ; ;
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08B6; VAI DI KA SAAMASVARA ANKA DVI ; Mn; 230; NSM; ; ; ; ; ; ;
Vaidika Marks Rendering Rules:

The following text is to be added at the end of present text in R 10 of Devanagari

“The Vaidika Swaraadi Chihnas, Vaidika Svaraankan Chihnas, Vaidika Saamavara Chihnas are to be rendered above, below and/or right side of the syllable”

Proposed text for R10

R 10: Other modifying marks, in particular bindus and svaras, apply to the orthographic syllable as a whole and should follow (in the memory representation) all other characters that constitute the syllable. The bindus should follow any vowel signs, and the svaras should come last. The relative placement of these marks is horizontal rather than vertical; the horizontal rendering order may vary according to typographic concerns.

\[ KA_n + AA_{v3} + CANDRABINDU_n \]

\[ क + ा + ॐ \rightarrow काँ \]

The Vaidika Swaraadi Chihnas, Vaidika Svaraankan Chihnas, Vaidika Saamavara Chihnas are to be rendered above, below and/or right side of the syllable.

Examples of Vaidika Swaraadi Chihna:

**Class A:** Single vowel syllable:

\[ AA_n + VAIIDIKA VISARGA_n \]

\[ आ + Ṣ \rightarrow आ ॐ \]

**Class B:** Single consonant syllable:

\[ KA_n + I_{v3} + VAIIDIKA ANUSVAARA_n \]

\[ क + ि + ्ष \rightarrow किछ \]

**Class C:** Multiple consonant syllable:

\[ TA_n + VIRAMA_n + VA_n + VAIIDIKA ANUSVAARA_n \]

\[ त + ् + व + ्ं \rightarrow तवः \]
Examples of Vaidika Svaraankan Chihna:

Class A: Single vowel syllable:
AA_n + VAIDIKA SVARITA_n

\[ \text{आ} + \text{।} \rightarrow \text{आ} \]

Class B: Single consonant syllable:
MA_n + VISARGA_n + VAIDIKA SVARITA_n

\[ \text{म} + \text{ः} + \text{।} \rightarrow \text{मः} \]

Class C: Multiple consonant syllable:
SA_n + VIRAMA_n + TA_n + U_vs + VAIDIKA SVARITA_n

\[ \text{स} + \text{ढ} + \text{ङ} + \text{ळ} \rightarrow \text{सळ} \]

Examples of Vaidika Saamasvara Chihna:

Class A: Single vowel syllable:
O_n + VAIDIKA SAAMASVARA_n

\[ \text{ओ} + \text{।} \rightarrow \text{ओ} \]

Class B: Single consonant syllable:
THA_n + AA_vs + VAIDIKA SAAMASVARA_n

\[ \text{थ} + \text{आ} + \text{।} \rightarrow \text{था} \]

Class C: Multiple consonant syllable:
TA_n + VIRAMA_n + SA_n + U_vs + VAIDIKA SAAMASVARA_n

\[ \text{त} + \text{ढ} + \text{ङ} + \text{ळ} \rightarrow \text{तळ} \]
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