Doc Type: Working Group Document
Title: Proposal to encode the Grantha script in the BMP of the UCS
Source:
Author: M.D. Kulkarni. Programme Coordinator. GIST GROUP- CDAC. INDIA
Status: Liaison Contribution
Action: For consideration by JTC1/SC2/WG2 and UTC
Replaces: -
Date: 2-04-2008

L2/10-048

1. INTRODUCTION.

1.1. GRANTHA SCRIPT: A HISTORICAL OVERVIEW[1]:

The term "Grantha" is derived from the Sanskrit and etymologically refers to a

book or rather a bundle of palm leaves. Like Vatteḷuṭṭu and ancient Tamil Script,

Grantha is supposed to have derived from Tamil Cave which philologically belongs to the Southern Brāhmī branch. It is supposed to have evolved gradually from the scripts of the Mauryan and Satavāhana dynasties. Grantha script was used for writing Sanskrit characters.

1.2. THE EVOLUTION OF GRANTHA

The variety of Grantha used to represent both Tamil and Sanskrit is known as Tamil Grantha and the earliest forms can be traced to the Pallava Dynasty (circa 500-600 A.D. But inscriptions in Grantha are obtained from the 8th Century onwards. Based on the different periods of its evolution, Grantha script can be classified into 4 periods:

-Archaic Grantha which is the script before the 7th Century A.D. Copper plates of the Pāllakada era are representative of this period. Some inscriptions in the Badāmi caves are also representative of this style.

-Middle Grantha comprises inscriptions between the 7th and 9th Century A.D. which roughly coincides with the Cola dynasty. Copper plates from this era as well as those of the Pallava period belong to this variety of Grantha.

-Transitional Grantha can be placed between the middle of the 10th Century up to the 13th Century A.D. A considerable amount of palm leaf documents belong to this period.

-Modern Grantha starts from the end of the 13th Century up to the present day. Inscriptions of the Vijayanagara period belong to this period as do printed documents going right back to the 18th Century. The *Alphabetum grandonico-malabaricum sive samscrudonicum* first printed in 1772 by the Polyglot press, Rome is evidence of one of the first metal-type representations of Grantha.

Among Indian scripts Grantha is unique, in the sense that it was specifically designed and evolved to write Sanskrit.

2. STRUCTURE.

---

[1] The historical over-view of Grantha script and the samples provided except where otherwise specified are based on Venugopal, 1983 Visalakshy 2003, Visalakshy 2007.

Structurally Grantha is the closest representation of Brāhmī and represents the major features of Brāhmī:

- ➤ Vertical stacking is preferred to Linear arrangements of consonant clusters and geminates
- ➤ The repha: shown in Brāhmī as a vertical line above constituent clusters in which the letter *ra* is the first consonant is also present in Grantha
- ➤ Similar treatment is given to the rakar i.e. clusters in which the letter "*ra*" is the second constituent.
- ➤ The use of a subsidiary character for "*ya*' is shared by both Brāhmī and Grantha
- ➤ Finally both Brāhmī and Grantha use the anuswāra for representing homo-organic nasals and as well to represent final nasals in "*ma*".

3. CHARACTER SET
Since Grantha was used literally to "transliterate" Sanskrit, the character set of Grantha closely resembles that of Sanskrit.

- ➤ Vowels are fourteen in number. Of these 7 are the basic symbols. Long vowels and diphthongs are derived from these.
- ➤ Vowel Modifiers:13 vowel modifiers exist, there being no modifiers for full vocalic short *l* and full vocalic long *l*.
- ➤ Grantha admits 34 basic consonant characters. As with all Brāhmī derived scripts, the consonant admits the implicit vowel schwa. Pure consonant value is obtained by use of the virāma
- ➤ Diacritic markers: Grantha has two diacritic markers: the anuswāra and the visarga. The anuswāra is a latter addition and in Archaic as well as Transition Grantha the letter *ma* is used to represent the nasal value.
- ➤ Subsidiary consonants: A special feature of Grantha is the use of subsidiary symbols for consonants. These are three in number: the use of a subsidiary *ya* and two allographs for *ra* depending on whether ra precedes the consonant (rafar) or follows it.(cf. infra)

5. NUMERALS
Grantha has twelve basic numerals 1-10 and further representation for 100 and 1000. All other numbers are represented by a combination of these basic numerals. In such cases the basic set is arranged linearly Thus 21 is read as 2 10 1 i.e. 2x10+1, 951 is 9x100+5x10+1

A special feature of Grantha is also the use of distinctive symbols for fractions: All fractions are conceived to be part of 320 and the symbols range from 1/320 to 240/320.

6. ORDERING.
Although there is no marked evidence of collation in Grantha, the collation order seems to be the same as in Sanskrit.

7. STANDARDISATION:
As with all classical scripts, Grantha shows variants for a given grapheme. Since for a given grapheme a unique representation is a must in Unicode, all efforts have been made to ensure that the grapheme is truly representative. The principle of frequency of use and

spread has led to the use of one allograph as representative of the particular grapheme to the detriment of the other allographs.

8. CHARACTER NAMES. *Names provided in the chart are based on the transliteration values as accepted by Unicode and are intended to be mnemonic.*

9. BIBLIOGRAPHY.
Bühler J.G., "Indian Paleography" in *Indian Antiquary*. Vol. 33. 1904.
Diringer, D.; *The Alphabet*. Munshiram Manoharlal. New Delhi. 1996.
Gai G.S.; *Introduction to Indian Epigraphy*. CIIL Press. Mysore. 1986.
Heras H.; *Studies in Proto Indo-Mediterranean Culture*. Bombay. 1953
Mangalam S.J.; *Palaeography of Malayalam Script.* Eastern Book Linkers. New Delhi. 1988.
Ojha G.H. *Bhāratiya Prācina Līpīmālā*. Ajmer Press. 1918.
Pandey R.B.*Indian Palaeography*. Motilal Banarsidas. Varanasi. 1957.
Venugopalan, K.. *A primer in Grantha characters* St. Peter, Minn: James H. Nye 1983
http://dsal.uchicago.edu/digbooks/dig_toc.html
Sircar D.C., *Indian Epigraphy*. Motilal Banarsidas. New Delhi. 1964.
Visalakshy P.; *Modi Script*. Dravidian Linguistics Association. Thiruvananthapuram, 2003
--.; *Nandinagari Script*. Dravidian Linguistics Association. Thiruvananthapuram, 2003
--; "Nandinagari and Modi Scripts".in *Proceedings of the National Workshop on Calligraphy and Typography*. (in press) GIST-CDAC. Pune 2007.
Witzel M..*Substrate Languages in Old Indo-Aryan* IJDL. XXX, 2001

10. SUBSTANTIATION

Although, often considered as an extinct script, Grantha is still alive and practiced and taught in Gūrūkuls. At the naming ceremony of a child Grantha is used to recite the invocations. It is therefore proposed that Grantha be not treated as an extinct script but along with Vedic Sanskrit and Avestan included in the BMP Plane. Samples of Grantha on Copper Plate, Stone carving, Palm Leaf and Printed format, are provided below.

Fig1. *Hand-written sample of Grantha with an illustrative text from the Bhagavad-Gita*[2]

From the Bhagavadgītā:

1.1-5

4.33-35

15.1-2

13

Fig.2. Palm-Leaf Sample from UNESCO'S site of Preservation of Palm Leaf mss[3]
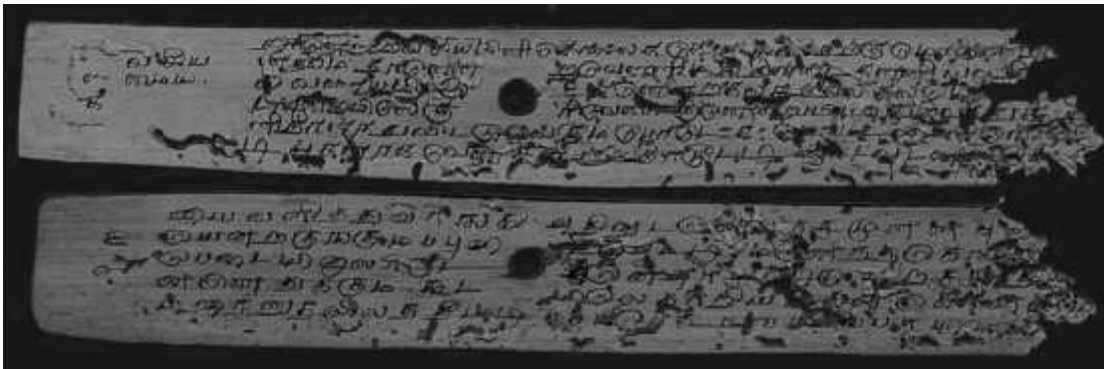
Fig.3. Sample of Palm-leaf Grantha[4]

Fig.4. Sample of copper Plate Grantha[5]

---

[3]   www.xlweb.com/heritage.jpg
[4]   Visalakshy 2003 p. 300
[5]   www.proel.org/alfabetos/grantha.html

Fig. 5 Sample of Copper Plate Grantha[6]: *Dalavāy agrahāram plate of varatuṅgarāma*

TABULAR REPRESENTATION OF GRANTHA
08 is proposed but could be any number. Grantha characters have been mapped to Devanagari to facilitate correlation.

Code	Char	Code	Char	Code	Char
0801		080F	வன	081D	சு
0802	்ं	0810	வென	081E	ஞ
0803	்ঃ	0811		081F	ㄥ
0804		0812		0820	○
0805	சு	0813	ஒ	0821	லெ
0806	சூ	0814	ஒென	0822	வெ
0807	ஐ	0815	கூ	0823	ண
0808	ஃஈঃ	0816	வ	0824	த
0809	உ	0817	ஈ	0825	யை
080A	உள	0818	ஊ	0826	ஒ
080B	ஜ	0819	ஜ	0827	ய
080C	எஈ	081A	ஶ	0828	ந
080D		081B	ஶர	0829	
080E		081C	ஜ	082A	பெ

082B	ஷ	083A		0849	
082C	ஜ	083B		084A	
082D	ஹ	083C		084B	ொ
082E	உ	083D	உ	084C	ௌ
082F	ய	083E	ா	084D	ெ
0830	ர	083F	ி	084E	
0831		0840	ீ	O84F	
0832	ஐ	0841	ு	0850	
0833	ஊ	0842	ூ	0851	
0834		0843	ஜ	0852	
0835	வ	0844	ஜ	0853	
0836	ஶ	0845		0854	
0837	ஷ	0846		0855	ப
0838	ஸ	0847	ெ	0856	ஃ
0839	ஹ	0848	ை	0857	ங

0858	௸		0866	௦		0874	௴	
0859			0867	க		0875	௵	
085A			0868	உ		0876	சூ	
085B			0869	ஙூ		0877	சௌ	
085C			086A	ஞூ		0878	ப	
085D			086B	௹		0879	ஶ	
085E			086C	சூ		087A	௸	
085F			086D	எ		087B	௶	
0860	ௐ		086E	அ		087C	௺	
0861	௕		086F	கூ		087D	௻	
0862			0870	ம		087E	சூ	
0863			0871	டா		087F		
0864	I		0872	எட				
0865	II		0873	௴				

The Grantha Script being a cursive correlate of Devanagari script, it has been mapped to the same.

GRANTHA	
Various signs (Modifiers)	
0801	
0802	◌ॕ GRANTHA SIGN ANUSVARA
0803	◌ঃ GRANTHA SIGN VISARGA
Independent vowels	
0804	
0805	அ GRANTHA LETTER A
0806	ஆ GRANTHA LETTER AA
0807	இ GRANTHA LETTER I
0808	ஈ GRANTHA LETTER II
0809	உ GRANTHA LETTER U
080A	ஊ GRANTHA LETTER UU
080B	ஜ GRANTHA LETTER VOCALIC R
080C	எஉ GRANTHA LETTER VOCALIC LA
080D	
080E	
080F	ன GRANTHA LETTER E

0810	ஙை GRANTHA LETTER AI
0811	
0812	
0813	ஓ GRANTHA LETTER O
0814	ஙௌ GRANTHA LETTER AU
Consonants	
0815	கூ GRANTHA LETTER KA
0816	வ GRANTHA LETTER KHA
0817	ம GRANTHA LETTER GA
0818	வ⎪ GRANTHA LETTER GHA
0819	ஐ GRANTHA LETTER NGA
081A	வ GRANTHA LETTER CA
081B	உஉ GRANTHA LETTER CHA
081C	ஜ GRANTHA LETTER JA
081D	சு GRANTHA LETTER JHA
081E	ஞ GRANTHA LETTER NYA
081F	∠ GRANTHA LETTER TTA

0820	○ GRANTHA LETTER TTHA
0821	ல GRANTHA LETTER DDA
0822	ல GRANTHA LETTER DDHA
0823	ண GRANTHA LETTER NNA
0824	த GRANTHA LETTER TA
0825	ய GRANTHA LETTER THA
0826	உ GRANTHA LETTER DA
0827	ய GRANTHA LETTER DHA
0828	ந GRANTHA LETTER NA
0829	
082A	ப GRANTHA LETTER PA
082B	ப GRANTHA LETTER PHA
082C	ப GRANTHA LETTER BA
082D	ஒ GRANTHA LETTER BHA
082E	உ GRANTHA LETTER MA
082F	ய GRANTHA LETTER YA

0830	௰ GRANTHA LETTER RA
0831	
0832	௱ GRANTHA LETTER LA
0833	௲ GRANTHA LETTER LLA[7]
0834	
0835	௵ GRANTHA LETTER VA
0836	௶ GRANTHA LETTER SHA
0837	௷ GRANTHA LETTER SSA
0838	௸ GRANTHA LETTER SA
0839	௹ GRANTHA LETTER HA
083A	
083B	
083C	
083D	꣍ GRANTHA SIGN AVAGRAHA
Dependent vowel signs (Matras)	
083E	◌ா GRANTHA VOWEL SIGN AA
083F	◌ி GRANTHA VOWEL SIGN I
0840	◌ீ GRANTHA VOWEL SIGN II

---

[7] The retroflex lla is because of Tamil Influence and is normally replaced by the dental *la* ல , except in Tantric texts

0841	◌ꔵ GRANTHA VOWEL SIGN U
0842	◌ꔶ GRANTHA VOWEL SIGN UU
0843	◌ꔷ GRANTHA VOWEL SIGN VOCALIC R
0844	ꔸ GRANTHA VOWEL SIGN VOCALIC RR
0845	
0846	
0847	ꔹ◌ GRANTHA VOWEL SIGN E
0848	ꔺ◌ GRANTHA VOWEL SIGN AI
0849	
084A	
084B	ꔻ◌ꔼ GRANTHA VOWEL SIGN O
084C	ꔽ◌ꔾ GRANTHA VOWEL SIGN AU
Various signs	
084D	◌ꔿ GRANTHA SIGN VIRAMA = halant (the preferred Indian name) • suppresses inherent vowel
084E	
O84F	
0850	
0851	
0852	
0853	
0854	
Major Fractions	
0855	ꕀ Grantha Fraction 80/320 read as ¼

0856	㉕ Grantha Fraction 160/320 read as ½
0857	㉕' Grantha Fraction 240/320 read as ¾
Additional Consonants	
0858	㇤ **Grantha Subsidiary Consonant ya (added to base consonants)**
0859	
085A	
085B	
085C	
085D	
085E	
085F	
ADDITIONAL VOWELS FOR SANSKRIT	
0860	㉓ GRANTHA LETTER VOCALIC RR
0861	㉓ GRANTHA LETTER VOCALIC LL[8]
0862	
0863	
GENERIC PUNCTUATION	
0864	ǀ Grantha Danda
0865	ǁ Grantha Double Danda
DIGITS	
0866	౦ Grantha Digit zero
0867	௧ Grantha Digit one

---

[8]   Never ever used, but shown in all primers for sake of symmetry.

0868	உ Grantha Digit two
0869	௩ Grantha Digit three
086A	௪ Grantha Digit four
086B	(ரு) Grantha Digit five
086C	சூ Grantha Digit six
086D	எ Grantha Digit seven
086E	அ Grantha Digit eight
086F	கூ Grantha Digit nine
0870	ய Grantha Digit ten
0871	௱ Grantha Digit one hundred
0872	எ௫ Grantha Digit one thousand
MINOR FRACTIONS	
0873	௴ Grantha Fraction 1/320
0874	௱ய Grantha Fraction 2/320
0875	௵ Grantha Fraction 4/320
0876	சூ Grantha Fraction 8/320

0877	௷Grantha Fraction 12/320
0878	∪ Grantha Fraction 16/320
0879	∪ᴗ Grantha Fraction 20/320
087A	൦ᵁᴗGrantha Fraction 32/320 read as 1/10
087B	௶ Grantha Fraction 40/320 read as 1/8
087C	௸Grantha Fraction 48/320
087D	௹Grantha Fraction 60/320
087E	௺ Grantha Fraction 64/320
087F	

The following fractions are not admitted as they are composites and can be derived by joining more than one of the basic fraction shapes given above

�ௗ௸	Grantha Fraction 3/320
௦ௗ௸	Grantha Fraction 5/320
௦ௗ∪	Grantha Fraction 6/320
௦ௗ∪௸	Grantha Fraction 7/320
௷௸	Grantha Fraction 9/320
௷∪	Grantha Fraction 10/320