SCOPE AND POTENTIALITY OF "SARMA'S UNIFIED SCRIPT" (SUS) IN MODERNIZING LANGUAGES

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ABSTRACT :

"SUS" stands for Sarma's Unified Script. It is the latest Unified Script invented and published in November, 2009. Alike earlier unified scripts this one also claims to be capable of writing all the languages of the world. None of the unified scripts invented prior to the invention of "SUS" could satisfy the purpose. We would have to wait for a few years to see if "SUS" can really "write all languages of the world". However, from the firsthand investigation it may be seen that "SUS" has made use of principles and systems which were never by the inventors of the unified scripts. Also its scripts are so simple that the new learners may need $1/4^{th}$ or less time to learn those.

Men's profound love is generally associated with their mother tongue or language. Whatever difficult or bad-sounding their mother-tongues might be, they cannot tolerate its alteration. In East Pakistan in 1952, the common people even sacrificed their lives for the cause of their mother tongue, Bengali. Same however, is not the case with the scripts, with are used merely for writing the language. In any language the scripts act like carry-bags and serve the purpose of transportation. So, it is easily possible to replace one type of script by another, so long the new script does not change the verbal language including sound and general character of the language. In fact many prominent languages of this world have changed their scripts for genuine reasons.

In order to learn a language, the children need lot of time, stationary and energy. The more complicated are the scripts the more will be the investment. On the other hand, the investment will be less for less complex scripts. In such a reality shifting from the complex to the simple one may result in tremendous saving. A person proficient in writing in one language needs to learn another new set of scripts in order to learn a second language. This problem would cease to exist if there exists an easy and generally acceptable set of scripts capable of writing all languages.

From time immemorial, "Unified Script" i.e. the script capable of writing all the languages is the dream of the experts. Kublai Khan, the king of Tibet initiated one such endeavor in 1260 A.D. The Lama who was assigned this task invented the script "Phags Pa" first time in 1269. Vitaly Vetash, an artist and a linguist from Russia worked for 22 years from 1977 to 1999 and invented Interbet. It is now known to all that none of these inventions could in fact satisfy the multifarious needs of various

languages. In November 17, 2009 two persons (Bijon B. Sarma and Mira Sarma Parai) invented "SUS" (Sarma's Unified Script) and published the principles in a book (**Ref. 01**). Time is still immature to comment if or how far this Unified Script would be able to meet the writing needs and expectations of various languages. However, in view of the fact that SUS, the latest unified script utilized some unique and novel principles, there are reasons to believe that it would be able to meet the needs of all languages. In the above mentioned book the authors have merely explained the basic principle of "writing all languages of the world by using a single set of self-generating scripts". It means, if various languages intend to accept it as their writing media, then they would have to make manipulations, modifications etc. in order to meet their specialized needs and characters.

INTRODUCTION :

What men invented first was the vocal language. Later, they felt for a medium to carry those from one place to another and for that purpose, invented Scripts. The processes in which the scripts were invented in the distant past have gone under the veil of oblivion. However, it is almost sure that no logic or scientific deduction ever worked behind their creation. The scripts of some languages are quite difficult to identify, cumbersome to scribe and tough to decipher. Due to this reason some languages have changed or modified all or some of their scripts. None, however, dared to create entirely new set of alphabet on the basis of logic and scientific deductions. One strong reason for not doing this might be, with vocal language the scripts also have attained some sort of emotional attachment because of their long time use.

Kublai Khan, the Tibetan ruler was one of the pioneers who thought of inventing a common script usable by many languages. He assigned one Tibetan Lama to find out scripts through which all the languages used in discrete areas of Tibet could be written. The script devised by this Lama is known as Phags-pa. Two versions of this script are available, (01) the standard script and (02) the seal script. Both types are shown below in Figure 01 and Fig. 02 below.

m ka [k] ta [t] tsa [ts] ra [r] e [s] m kha [k'] ma [t] ma tsha [ts'] la [l] o [o] m ga [g] ma [d] ma [ts'] ma ma [ts'] ma <td< th=""><th>Fig. No. 01. Standard versi</th><th colspan="8">Fig. No. 01. Standard version of PHAGS-PA SCRIPT :</th></td<>	Fig. No. 01. Standard versi	Fig. No. 01. Standard version of PHAGS-PA SCRIPT :							
kha [k'] kha [t] kha [t] kha [ts] la [1] <	=m ka [k] F	ta [t] 🖪	tsa [ts] ===	ra [r] ——	e [ε]				
ga [g] da [d] dza [dz] sha [c] rep (qa [q]) nga [ŋ] na [n] wa [v] sa [s] rep (xa [x]) a [tc] pa [p] fa [p] ta [z] ha [h] fa [f] a [tc] pa [p] fa [p] ta [z] fa [Ø] fa [f] b [tc] pa [p] fa [v] ta [Ø] fa [Ø] fa [f] ja [dz] pa [b] fa [Ø] fa [Ø] ee [e] ma [n] ja [Ø] ma [m] ja [J] u [u] w [w] Courtesy and Source: http://babelstone.blogspot.com. fa [J] fa [J] fa [J]	🔁 kha [k'] 🛃	tha [ť] 🔠	tsha [ts'] ៧	la [l] 📥	0 [0]				
mga [n] ma [n] wa [v] sa [s] xa [x] ca [tc] pa [p] zha [z] ma [h] fa [f] ca [tc] pa [p] zha [z] ma [h] fa [f] cha [tc] pa [p] za [z] fa [b] fa [f] ja [dz] pa [p] a [a] [a] [b] fa [b]	📥 ga [g] 드	da [d] 🗖	dza [dz] 🚍	sha [ç] 💶	qa [q]				
a [tc] pa [p] fa [z] fa [f] a cha [tc'] pha [p'] za [z] fa [Ø] fa [f] a cha [tc'] pha [p'] za [z] fa [Ø] gga [?] b ia [tc'] pha [b] a [Ø] fa [i] ee [e] ja [dz] ba [b] a a [Ø] fa [i] ee [e] ma nya [j] ma u [u] w [w] courtesy and Source: http://babelstone.blogspot.com. thttp://babelstone.blogspot.com. thttp://babelstone.blogspot.com. thttp://babelstone.blogspot.com.	🚍 nga [ŋ] 🗃	na [n] 🖪	wa [v] 🔜	sa [s] 🎦	xa [x]				
Image: Second state of the system of the	🗃 ca [tç] 🗾	pa [p] 🖃	zha [ʑ] टा	ha [h] 💾	fa [f]				
<pre>ja [dz] 2 ba [b] 2 -a [Ø] 1 i [i] - ee [e] nya [ŋ] 3 ma [m] 2 ya [j] u [u] 2 w [w]</pre>	击 cha [tɕˈ] 르	pha [p'] 📕	za [z] 🖾	'a [Ø] 📼	gga [?]				
R nya [ŋ] N ma [m] Z ya [j] L u [u] Z w [w] R y [j] Courtesy and Source: http://babelstone.blogspot.com .	르 ja [dʑ] 🗖	ba [b] 🗖	-a [Ø] 🗖	i [i] —	ee [e]				
Courtesy and Source: http://babelstone.blogspot.com.	🕞 nya [ŋ] 🛋	ma [m] 🚚	ya [j] 🗖	u [u] 🗖	w [w]				
	Courtesy and Source: http://b	abelstone.blogspot.co	<u>m.</u>	_	у [ј]				

Fig. No. 02. Seal version of PHAGS-PA SCRIPT :



After him numerous experts all over the world endeavors and devised a great number of unified script. In the last decade of the last century Vitaly Vetash, an artist and a linguist from Russia published his unified script. He worked for long 22 years (from 1977 to 1999) and invented Interbet. Interbet is the abbreviation for International Phonematic Alphabet. The names of letters in Interbet are mostly based on the ancient Phoenician and Greek alphabets, as well as the letters of the other alphabets. The number of letters in this alphabet is 45. Vitaly Vetash, the author proposed some linguistic signs also for modifying the sounds of the letters. In this system the same letters can be used to represent a number of phonemes. According to the author, these letters are sufficient to write all of the world's most widely-spoken languages. The author also claimed that this alphabet is suitable for a practical, international and universal system for writing any language. The 45-letter alphabet of Interbet has been shown in Fig. No. 03.

Fig. No. 03 Alphabet of INTERBET :



Investigations reveal that the "carry-bags" or scripts for languages were developed in the distant past in various regions on the basis of the situations prevailing at time. Then those were modified, in which act, however, retaining the ancestors' achievements were given preference. If a person enriched with knowledge and skills of modern science initiates a program of designing the scripts of any language today, definitely he would proceed in a completely different way and would come out with entirely different solution. By all possibilities such a solution would incorporate the following:

- (i) The scripts would be easy to identify and scribe.
- (ii) Since figurative scripts written by various persons at times turn illegible and difficult to decipher because of 'subjective variation'. Hence the expert is likely to go for stroke type, which is free from the above problem.
- (iii) The designed script preferably would show a logical relation in between the preceding and following script and there may exist a simple principle for their gradual transformation. It may be such that after the principle is understood, one can create those by himself if forgotten.
- (iv) For retaining the sound and dialect of the languages the scripts must retain the original sound (pronunciation) of the letters.
- (v) The scripts should be such that those can be used to write all major types of languages (viz. those writing from left to right, right to left, top to bottom or bottom to top, those using both small and capital letters, those using both letters and letter-signs etc.).

PRINCIPLES UTILIZED IN DEVISING UNIFIED SCRIPT :

Prior to the appearance of "SUS", all the earlier experts used some common principles in devising various Unified scripts. These are :

- (i) They picked up letters having the same or similar sound (pronunciation) from various languages.
- (ii) Then they assigned commonly used or newly devised 'signs' for each of those letters.

Thus Phags-pa came up with 41 letters and signs, Interbret 45, and so on. The problems that was associated this solution were :

(i) As a matter of fact letters from various languages do not sound exactly the same. Thus "B" in English does not sound like "Ba" (◄) of Bengali or "Be or Baa" (♀) of Arabic. Naturally any attempt to write these letters by one common script was liable to change their sounds. Probably no language can ever accept such change.

(ii) When one set of script is changed by another, with no apparent advantage in identification or scribing, the language-users fail to understand why they should change their scripts for another, without any advantage.

PRINCIPLES UTILIZED IN "SUS" :

As has already been mentioned, "SUS" came up with entirely different solution. The principles used in "SUS" may be summarized as following :

- (i) The pronunciation of all the letters of the language shall remain exactly the same, such that slightest change in the speaking of the language and its dialects may take place.
- (ii) What will be used in assigning the designed scripts for various letters will be determined by their numerical positions in the alphabet, and not anything like common sound.
- (iii) In order to eliminate the problem of identification or deciphering scripts (that take place because of subjective variations), "SUS" used stroke-type scripts in place of figurative types.
- (iv) In order to make the scripts simple, 'SUS" used minimum number of strokes, and in most cases this number is only 4 (Four).
- (v) "SUS" has utilized an extremely simple principle in devising the scripts. If forgotten, the learners themselves can create those by applying this principle.

PROCESS UTILIZED IN "SUS" : For the first time in the history of the invention of Unified Script, "SUS" used the following novel method and principle.

(01) "SUS" used the location of various letters in the alphabet as the basis of assigning the script. By doing this it was possible to retain the original sound and special dialects of each and every letter of any language.

(The letters of the alphabet of various languages are divided into "groups of 5". The first letter of each group is named "Group-head". The location of the first letter (i.e. group head) of the alphabet is 1.0, that of second, 1.01, that of the 15th letter, 2.4 and so on).

(02) After fixing the numerical locations of the letters "SUS" proposed the principle for designing the scripts, first for the group heads.

(The group heads are made with one horizontal stroke and one or more half-size vertical line. The half vertical line attaches with the horizontal line at four different locations. It starts from left lower corner and moves in a clock-wise direction. By manipulating these two types of lines it is possible to design about 14 group heads. This number of group heads is sufficient for making 5 X 14 = 70 letters. Most of the prominent languages have letters less than this number).

(03) After making the group heads "SUS" went for devising letters in each group.

(In doing this, "SUS" used the small vertical line. The first letter after the first group head, i.e. the 2^{nd} letter of this group, would have the script : the group head plus the small vertical line attached at the lower left corner. Then the small vertical line will be attached in other locations exactly in the manner described in case of designing the group heads. All the scripts under a group has been designed by following this basic principle).

It is obvious that the process is extremely easy and follows one simple principle such that, if forgotten a child himself can recreate the scripts.

PRACTICAL APPLICATION : Now we shall show with graphics how the above elements and principles are used in practice. The 4 number of strokes required for writing SUS scripts are the following :

- (i) 1 Horizontal line (used always in the central location),
- (ii) 1 half-size vertical line (used in 4 different locations),
- (iii) 1 short vertical line (used in 4 locations) and
- (iv) 1 short horizontal line (used in 2 locations, above and below).

These have been shown in Fig. No. 4 below.

Fig. No. 4 STROKES FOR WRITING "SUS" ALPHABETS :



LOCATIONS FOR THE VERTICAL STROKES : The locations in which the vertical strokes shall be used in the clock-wise direction have been shown in Fig. No. 5 below.

Fig. No. 5. FOUR DIFFERENT LOCATIONS FOR THE VERTICAL STROKE :



The group heads are designed by placing one horizontal line at the middle and then attaching 1, 2, 3 or 4 nos. half-sized vertical lines at the two extreme ends. The principle followed is, the first line will be joined at location 1, second at location 2 and so on. The Lines would start from down left to up and then from left to right. The operation shown by 1, 2, 3 and 4 would continue in a clockwise manner, as shown in the figure.

PRINCIPLES : The common principles used in devising the scripts of SUS are the following :

- (01) FINDING OUT GROUP-HEADS : The letters of the alphabet shall be divided into groups of 5 and the 1st and every 6th letter will be chosen as group-head.
- (02) MAKING THE GROUP-HEADS : The scripts for the Group-heads will be made by placing the vertical line at 4 different locations of the Horizontal line in a clock-wise direction.
- (03) MAKING OTHER LETTERS OF THE GROUP : The remaining four letters of each group will be made from the respective script of the group-head. In doing this, the small vertical line will be used in 4 different locations (similar to above) around the script of the group-head in clock-wise direction.
- 04) MAKING CAPITAL LETTERS : Any small letter devised in the above way turn to a Capital letter if the small Horizontal line is placed above.
- (05) USING VOWEL-SIGNS OR MODIFIERS : In Case of languages that use vowel signs or modifiers, specially designed modifiers has to be used at the middle portion of the horizontal line.

After narrating the general principles above, we shall discuss the how SUS scripts can be used in writing English, Bengali and Arabic alphabets.

SCRIPTS FOR ENGLISH ALPHABET :

STEP 01 : In English Alphabet there are 26 letters including both vowels and consonants. These have been :

- (i) Divided those into 6 groups of 5,
- (ii) The first letter of each group has beeb designated as Group-head and
- (iii) The location of all the letters have been determined numerically.

All these have been shown in Fig. No. 06 below.

Fig. No. 6. English Alphabet.

Group No.		GROUP HEAD	OTHER LETTERS AND THEIR NUMERICAL POSITIONS				
01	Letter	a	b	c	d	e	
	Numerical position	1.0	1.1	1.2	1.3	1.4	
02	Letter	f	g	h	i	j	
	Numerical position	2.0	2.1	2.2	2.3	2.4	
03	Letter	k	l	m	n	0	
	Numerical position	3.0	3.1	3.2	3.3	3.4	
04	Letter	р	q	r	S	t	
	Numerical position	4.0	4.1	4.2	4.3	4.4	
05	Letter	u	v	W	X	У	
	Numerical position	5.0	5.1	5.2	5.3	5.4	
06	Letter	Z					
	Numerical position	6.0					

STEP 02 : After Step 01, design of the scripts for the group- heads has been done. It has been done by using the half-vertical line at four different locations of the horizontal line. The process started at left-lower corner and progressed in the clock-wise direction.

This has been shown in Fig. No. 07 below.

Fig. No. 7. SUS SCRIPTS FOR THE GROUP-HEADS.

Principle followed	Horizontal line plus Vertical line in position 1.	Horizontal line plus Vertical line in position 2.	Horizontal line plus Vertical line in position 3.	Horizontal line plus Vertical line in position 4.
Group-head No.	01	02	03	04
English letter	а	f	k	р
SUS script				
Group-head no.	05	06		··
English letter	u	Z		
SUS script				

STEP 03 : *In the third step the remaining letters of each group has been designed by using the small vertical line in the aforementioned manner.*

This has been shown in Fig. No. 08 below. In addition to the English letter and the corresponding SUS scripts, their numerical labels also have been shown.

T	T.T.	0	ENGL	TOTT	ANT	OTTO	CODIDTO	OE	ENGTION	
H10	NO	x	HINCEL	JNH.		SUS.	NERIPIN	СЭН	HINGELINH	ΔΙ.ΡΗΔΚΗ.Ι
116.	110.	υ.	LINDI	1011	11110	000	DOM ID	$\mathbf{O}\mathbf{I}$	LINDLIDI	

Principle followed in all cases	Script for the group head only	Script for the group head plus small Vertical line in position 1.	Script for the group head plus small Vertical line in position 2.	Script for the group head plus small Vertical line in position 3.	Script for the group head plus small Vertical line in position 4.
Numerical location.	1.0	1.1	1.2	1.3	1.4
English letter	a	b	С	d	e
SUS script					
Numerical location.	2.0	2.1	2.2	2.3	2.4
English letter	f	g	h	i	j
SUS script					

Numerical location.	3.0	3.1	3.2	3.3	3.4
English letter	k	1	m	n	0
SUS script					
Numerical location.	4.0	4.1	4.2	4.3	4.4
English letter	p	q	r	S	t
SUS script					
Numerical location.	5.0	5.1	5.2	5.3	5.4
English letter	и	V	W	X	у
SUS script					
Numerical location.	6.0				
English letter	Z				
SUS script					

STEP 04 : *MAKING CAPITAL LETTERS : In English language, in addition to Small letters there are corresponding Capital letters also. The scripts for Capital letters have been designed by placing the small horizontal line above the script of the Small letter.*

It has been shown in Fig. No. 9 below.

Fig. No. 9 : CAPITAL LETTERS

SUS small				
English Small	a	Х	t	m

SUS capital				
English Capital	Α	X	Т	Μ

SCRIPTS FOR BENGALI ALPHABET

In Bengali there are 35 Consonants and 11 Vowels. In addition there are 10 Vowel signs which act as modifier. Also there are "combined letters" (Juktakkhar) in this language. Since it is difficult to write "combined letters" through modern equipments, at present the "combined letters" are being replaced by independent letters joined by a special sign called "Hasanta". Now we shall go step by step to show how SUS principles can be applied to design suitable scripts for Bengali alphabet.

STEP 01 : The 46 letters (Consonants 35 and Vowel 11) letters of Bengali alphabet have been

- (i) Divided into 9 groups, each having 5 letters,
- (ii) The first letter of each group has been marked as Group heads and
- (iii) The position of each letter in the alphabet has been determined numerically.

All these have been shown in Fig. No. 10 below.

Group No.		GROUP HEAD	OTHER LETTER	OTHER LETTERS OF THE GROUP AND THEIR NUMERICAL POSITIONS				
01	Letter(Sound in English)	Ф (Ka)	শ _(Kha)	ទា (Ga)	घ _(Gha)	E (Uma)		
	Numerical position	1.0	1.1	1.2	1.3	1.4		
02	Letter(Sound in English)	G (Cha)	کر _(Chha)	জ(Ja)	द्भ (Jha)	$\mathfrak{P}_{(\mathrm{Nia})}$		
	Numerical position	2.0	2.1	2.2	2.3	2.4		
03	Letter(Sound in English)	G (Ta)	گ(Tha)	い (Da)	G (Dha)	୩ _(Na)		
	Numerical position	3.0	3.1	3.2	3.3	3.4		
04	Letter(Sound in English)	O (ta*)	থ(tha*)	F (da*)	ध (dha*)	ন (na*)		
	Numerical position	4.0	4.1	4.2	4.3	4.4		

Fig. No. 10. Bengali Alphabet.

05	Letter(Sound in English)	A (Pa)	حه (Fa)	ব _(Ba)	ଅ (Va)	भ _(Ma)
	Numerical position	5.0	5.1	5.2	5.3	5.4
06	Letter(Sound in English)	य _(ja)	ব(ra)	ল _(la)	۹(sha)	ষ্(Sha)
	Numerical position	6.0	6.1	6.2	6.3	6.4
07	Letter(Sound in English)	স _(Sa)	ب (Rha)	G (Rhha)	ب (Ya)	ع(Ha)
	Numerical position	7.0	7.1	7.2	7.3	7.4
08	Letter(Sound in English)	অ (a)	মা (AA)	ই (EE)	ঈ _(EEE)	3 (0)
	Numerical position	8.0	8.1	8.2	8.3	8.4
09	Letter(Sound in English)	उ (00)	T (000)	೨ (E)	کر (OI)	3 (OU)
	Numerical position	9.0	9.1	9.2	9.3	9.4

STEP 02 : After Step 01, the scripts for the 9 group-heads have been designed by following the above mentioned principle.

These have been shown in Fig. No. 11 below.

Fig. No. 11. Group heads of Bengali Alphabet.

Principle followed	Horizontal line plus Vertical line in position 1.	Horizontal line plus Vertical line in position 2.	Horizontal line plus Vertical line in position 3.	Horizontal line plus Vertical line in position 4.
Group-head No.	01	02	03	04
Bengali letter (Sound in English)	Φ (KA)	G (CHA)	G (TA)	O (soft TA)
SUS script				
Principle followed	First Group-head plus small vertical line in the first available position.	First Group-head plus small vertical line in the second available position.	Second Group-head plus small vertical line in the first available position.	Second Group-head plus small vertical line in the second available position.

Group-head no.	05	06	07	08
Bengali letter(Sound in English)	A (PA)	ম্ _(JA)	স _(SA)	ञ्(A or O)
SUS script				
Principle followed	First group head plus short vertical line at position 1.			
Group-head no.	09			
Bengali letter(Sound in English)	F(U or OO)			
SUS script				

STEP 03 : *The remaining letters of each group have been designed by following the same principle.*

These have been shown in Fig. No. 12 below.

Fig. No. 12. Bengali Alphabet.

Principle followed in all cases	Script for the group head only	Script for the group head plus small Vertical line in position 1.	Script for the group head plus small Vertical line in position 2.	Script for the group head plus small Vertical line in position 3.	Script for the group head plus small Vertical line in position 4.	
Numerical location.	1.0	1.1	1.2	1.3	1.4	
Bengali letter(Sound in English)	Bengali etter(Sound in English) $\mathbf{F}(Ka)$ $\mathbf{A}(Kha)$ SUS script		গ (Ga)	ঘ্ (Gha)	E (Uma)	
SUS script						
Numerical location.	2.0	2.1	2.2	2.3	2.4	
Bengali letter(Sound in English)	G (Cha)	کر (Chha)	জ (Ja)	द्भ(Jha)	$\mathfrak{P}_{(\mathrm{Nia})}$	
SUS script						

Numerical location.	3.0	3.1	3.2	3.3	3.4
Bengali letter(Sound in English)	ট (Ta)	S (Tha)	ড(Da)	G (Dha)	୩ _(Na)
SUS script					
Numerical location.	4.0	4.1	4.2	4.3	4.4
Bengali letter(Sound in English)	(ta*)	থ _(tha*)	ኻ (da*)	ধ _(dha*)	م(na*)
SUS script					
Numerical location.	5.0	5.1	5.2	5.3	5.4
Bengali letter(Sound in English)	A (Pa)	حه (Fa)	ব (Ba)	ଅ(Va)	स्र _(Ma)
SUS script					
Numerical location.	6.0	6.1	6.2	6.3	6.4
Bengali letter(Sound in English)	지(ja)	ব(ra)	ল _(la)	শ _(sha)	ব্(Sha)
SUS script					
Numerical location.	7.0	7.1	7.2	7.3	7.4
Bengali letter(Sound in English)	স্ _(Sa)	ب (Rha)	G (Rhha)	र्भ(Ya)	र्(Ha)
SUS script					
Numerical location.	8.0	8.1	8.2	8.3	8.4
Bengali letter(Sound in English)	ञ (a)	আ(AA)	र्रे _(EE)	ঈ (EEE)	3 (O)
SUS script					
Numerical location.	9.0	9.1	9.2	9.3	9.4
Bengali letter(Sound in English)	উ (00)	T (000)	1 (E)	کر (OI)	3 (OU)
SUS script					

STEP 04 : In Bengali there is no Capital and Small letter. But there are Consonants, Vowels and also Vowel-signs used for modifying the consonants. In order to accommodate the Vowel sign or modifier "SUS" scripts have been designed with their middle portions free. We have designed the various modifiers at present in use in Bengali and shown below. However, the experts of the language can redesign those according to their choice.

The designed modifiers have been shown in Fig. No. 13.

MODIFIERS	আ	ſŀſ	শ্বি	ঙা	লে
Pronunciation in English	AA	EE	EEEE	U	UU
SUS script used as modifier	US script used as odifier				
	·				
MODIFIERS	า	દુ	ઉ	૭	হসন্ত
Pronunciation in English	E	IO	0	OU	Hasanta
SUS script used as modifier	+		+		

Figure No. 13. BENGALI MODIFIERS (VOWEL-SIGNS AND OTHERS):

MODIFIERS	ৠফলা	য ফ্লা	র ফ্লা
Pronunciation in English	HRI fala	AA	RA fala
SUS script used as modifier	#	+	

SCRIPTS FOR ARABIC ALPHABET :

Arabic alphabet has got similarity with Bengali alphabet because it uses Modifiers. However, as great exception with many languages Arabic is written from the right. This however, does not create any significant problem in using SUS script. Now we shall go step by step to show how SUS scripts can be used in writing Arabic letters.

STEP 01 : The 28 letters of Arabic alphabet have been divided into groups of 5, the first letter of each group has been assigned as group-head and numerical locations of each letter in the alphabet have been determined. All, however, has been done FROM THE RIGHT TO LEFT.

These have been shown in Fig. No. 14.

	Other letters				Group Heads
Letter	5	ث	ت	<u>ب</u>	, s
Numerical position in Alphabet	1.4	1.3	1.2	1.1	1.0
Pronunciation	(Jiim)	(thaa)	(taa)	(baa)	(alif)
Letter	ر	ذ ا	د	<u>خ</u>	ح
Numerical position in Alphabet	2.4	2.3	2.2	2.1	2.0
Pronunciation	(raw)	(jal)	(daal)	(Khaa)	(Haa)
Letter	ض	ص	ش	س	ز
Numerical position in Alphabet	3.4	3.3	3.2	3.1	3.0
Pronunciation	(Daad)	(Saad)	(shiin)	(siin)	(jha)
Letter	ف	ė	ع	ظ	4
Numerical position in Alphabet	4.4	4.3	4.2	4.1	4.0
Pronunciation	(faa)	(ghayn)	(ayn)	(joa)	(Toa)
Letter	ن	م	L	ک	ق
Numerical position in Alphabet	5.4	5.3	5.2	5.1	5.0
Pronunciation	(nuun)	(miim)	(laam)	(kaaf)	(qaaf)
Г_				1	
Letter			ي	٥	و
Numerical position in			6.2	6.1	6.0

Fig. No. 14. Arabic Alphabet (with pronunciation of letters in English and their numerical locations).

STEP 02 : *The group heads have been created by applying SUS principle.* Those have been shown in Fig. No. 15.

(yaa)

(haa)

(waaw)

Alphabet Pronunciation

Figure No. 15. Group-heads :

Group-head no.	04	03	02	01	
Arabic Letter	ط	j	۲	Ś	
Pronunciation	(Toa)	(jha)	(Haa)	(alif)	
SUS script					
How created	First Group-head plus Vertical line in position 4.	Horizontal line plus Vertical line in position 1.	Horizontal line plus Vertical line in position 2.	Horizontal line plus Vertical line in position 3.	

Group-head no.	06	05
Arabic Script	و	ق
Pronunciation	(waaw)	(qaaf)
SUS script		
HOW CREATED	Horizontal line plus Vertical line in position 4.	First Group-head plus Vertical line in position 3.

STEP 03 : *The SUS script for the group heads and remaining Arabic letters have been created following SUS principle* and shown in Fig. No. 16 below.

Figure No. 16. Arabic Letters :

	Other letters				Group Head
Arabic Lottor	ڭ ج		Ľ	ب ت	
SCS Script					
Pronunciation	(Jiim)	(thaa)	(taa)	(baa)	(alif)
Arabic Letter	ر	Ċ	د	Ċ	۲
SUS Script					
Pronunciation	(raw)	(jal)	(daal)	(Khaa)	(Haa)

Arabic Letter	ض	ص	ش	س	ر: ر
SUS Script					
Pronunciation	(Daad)	(Saad)	(shiin)	(siin)	(jha)
Arabic Letter	ف	ė	٤	ä	ط
SUS Script					
Pronunciation	(faa)	(ghayn)	(ayn)	(joa)	(Toa)
Arabic Letter	じ	م	し	بی	ق
SUS Script					
Pronunciation	(nuun)	(miim)	(laam)	(kaaf)	(qaaf)

Arabic		8	٩
Letter	ي	•	3
SUS Script			
Pronunciation	(yaa)	(haa)	(waaw)

Step 04 : Various modifiers now in use in Arabic have been designed shown below. The experts however, can redesign those according to their need and choice. The designed modifiers have been shown in Fig. 17.

MODIFIER SIGN MODIFYING ACTION 01 Jabar / This is placed above the consonant and it adds u (as in but) or aa sound. 02 Jer This is placed below the consonant and it adds e (as in pet) sound. 1 03 Pesh This is placed above the consonant and it adds u (as in put) sound. 04 Double 11 This is placed above and it adds un (as in bun) sound. Jabar 05 Double Jer This is placed below the consonant and it adds in (as in inn) sound. // 06 Double 69 This is placed above the consonant and it adds oon (as in moon) sound. Pesh 07 Sakin _____ There is no sign for Sakin. But three letters $\frac{1}{2}$ (alif), \underline{g} (waaw) and \underline{g} (yaa) are pronounced with a lingering sound when (a) Jabar is placed on the letter after $\frac{1}{2}$ (alif), (b) Pesh is placed on the letter before \underline{J} (waaw), and (c) Jer is placed on the letter before <u>و</u>(yaa).

Figure No. 17. ARABIC MODIFIERS (VOWEL-SIGNS) :

08	Jajam	^	This is placed above the letter. When placed in any letter it is pronounced
			jointly with the previous letter.
09	Tasdid	W	This is placed above the letter and it makes double sound.

SCRIPTS FOR DIGITS (NUMBERS) BY "SUS" :

In case of Digits (numbers) also, as usual "SUS" advocates for retaining the original sound or pronunciation of the numbers used in various languages. The script expressing the written form of the numbers, however, may be modified for the sake of simplicity, legibility, writing-ease and speed. Such scripts, as designed in "SUS" have been explained below.

01. STROKES TO BE USED : (i) 1 vertical line, (ii) 1 small horizontal line to be used in 2 locations and (iii) 1 free horizontal line to be used in 2 locations. These lines have been shown in Fig. No. 18.

Fig. No. 18 STROKES FOR WRITING "SUS" DIGITS :



The various locations in which the Small and Free horizontal lines will be used have been shown in Fig. No. 19.

Fig. No. 19 USE AND LOCATIONS OF STROKES :



The SUS scripts for all the 10 digits have been shown in Fig. No. 20.

Fig. No. 20 SCRIPTS FOR 10 "SUS" DIGITS :

1	2	3	4	5	6	7	8	9	0

ADVANTAGES OF "SUS" :

A short look at the scripts used in various languages and those proposed in "SUS" might reveal how easy the "SUS" scripts are in points of identifying letters, writing those on papers and even typing with key boards. It is obvious that it can be typed with a key board with only a few keys. However, since "SUS" has not still been used anywhere, we have to opine on various aspects of it only from theoretical considerations. Some of these considerations are given below.

(01) LEARNING - CHILDREN'S EDUCATION : The speed of writing depends upon practice. However, it is obvious that the scripts constituted of a few straight strokes running in horizontal and vertical directions can be written more speedily than those constituted of curve, straight and angular lines running in any direction, moving at times in clockwise and the next moment in the anticlockwise directions, then joining in a straight line and the following moment ending up in a loop, lifting the pen and applying a dot or stroke in another location and so on. It is also obvious that in comparison with scripts written with many strokes, it would be much easier.

There can be no point in denying that the scripts written in the above way (i.e. with the combination of curve and straight lines running in all possible angles and directions) and subjected to natural human deviations (or subjective variations) would result in difficulties in deciphering. Such possibility is nil or extremely little in the SUS script. The locations of the minor strokes are so well defined towards various distinct corners that mistake is less probable.

Children's primary education, in general, is conducted all over the world according to the following 4 steps :

- Step 01 : Memorizing the pronunciation of the letters (alphabet),
- Step 02 : Relating the pronounced sounds with the scripts (ability to identify the script of the sound or vice versa),
- Step 03 : Learning to write the scripts and lastly,

Step 04 : Learning word-writing, grammar and other rules of the language.

Step 01, i.e. memorizing the pronunciation of the alphabets starts with picture books. In this book independent pictures of various objects or actions are presented. In each of these pictures, the

starting sound of the name of the object or action is the 'Letter' of the alphabet. Being habituated to those objects and actions in their mother tongue the children can easily say or pronounce the words and first sounds. The parents or teachers teach them to separate the first sound from that word, like, in English language, "A for Apple, B for Boy" etc. The children in general enjoy this part of learning. An intelligent child can memorize the alphabets (say, containing maximum 50 letters) within a month.

- Step 02 starts after a child can say all the "first sounds" or letters from memory. At this stage the child is shown the peculiar-looking scripts and is asked to relate each of the sound to one of the figures or scripts. The children can identify the scripts when those are placed sequentially, i.e. one after the other. But they need a lot of time to identify any script independently, i.e. when presented alone. Depending upon the complexity of the scripts a time of three to five months is required for this exercise.
- Step 03 starts after the child can identify the scripts. At this stage he is supplied with paper and ink and asked to draw the scripts. There are numerous processes for this exercise and those vary with the nature of the scripts used in various languages. The task ends here for the language that uses only words, like English. This language however, has increased complexity in learning by introducing 4 different sets of alphabet, viz. (i) Capital letters for Printing, (ii) Small letters for Printing, (iii) Capital letters for writing and (iv) Small letters for writing. Depending upon the complexity and number of scripts a child may need 6 to 12 months for writing all the scripts.
- Step 04 is the period during which the child is asked to learn grammar and other rules of the language. Depending upon the complexities of the language a child may need several months to several years to learn those.

Now, ignoring the last step i.e. Step 04, the time required to cross the first three steps in case of traditional scripts is about : 10 to 18 months.

After observing how much time a child may need to learn to write the traditional scripts, we shall now investigate the probable time for the same job, if the traditional scripts are replaced by "SUS" script.

Step 01 : Memorizing the pronunciation of the alphabets : This process would remain the same and the children would memorize the letters with the help of picture book. Let the time required be the same i.e. one month.

- Step 02 : Relating the pronounced sounds with the scripts : The children would have to memorize the letters in groups of 5. So, for an alphabet with say, 40 letters they would have to memorize 8 group heads. Whereas a child needs to relate 40(say) sounds with 40 irreverent and somewhat peculiar signs, in case of "SUS" he would be asked to relate 8 group-head letters with 8 designed scripts, where those scripts are also related with one another in a progressive manner under a simple principle. There is no reason for any child to need more than one week to learn these group heads. After this is done, the child would be asked to identify the remaining scripts of the group, which also follow certain simple principle. This job also should not take more than two weeks.
- Step 03 : Learning to write the scripts : At this stage the children may be supplied with grid-line papers and to practice horizontal and half vertical lines. One week may be devoted for writing the 4 types of strokes. Then he can go for writing the remaining scripts of each group. Another 2 week's practice may enable any child to be able to write down the scripts. Thus the total time required to cross the first three steps may be about 2 months, compared to 10 to 18 months for learning the traditional scripts.

Even if a child needs 3 months to learn writing of "SUS" scripts, against that of the traditional script by say 12 months, then there is a saving of 9 months. This saving in terms of time, effort, cost on stationary and logistics for a period of nine months for the huge number of learners of a language will be enormous. In a global scale, this may be a welcome proposition for the welfare of the earth with scarce resources including energy.

(02) LEARNING – ILLITERATE ADULTS : In many countries illiteracy among the adults is a great problem. Because of their long acquaintance with the society such adults can pronounce and identify the letters. But then cannot go any further because of complexity of the scripts and cannot afford to spend long time to learn those. Being adult, such people have gained natural skill of maneuvering fingers. So, it will be easy for them to learn the remaining part. They may not need more than 3 months to learn first hand writing through "SUS" script.

(03) LEARNING – FOREIGNERS : When the foreigners endeavor to learn a second language, they find problems due to complex type of scripts. "SUS" script may be quite easy and helpful for them.

(04) COMMON ADVANTAGE OF "SUS" SCRIPT : In the contemporary society men mostly use machines (typewriter, computer etc.) in writing. In spite of these, however, the importance of 'handwriting' prevails and shall remain so forever. The nature of its importance however, has changed in the present society. At one time "excellent looking" hand writing was considered as a blessing.

Nowadays, just legible handwriting are acceptable all over. As a matter fact those who need to write swiftly and in mass quantity cannot ensure "excellent handwriting". However, easy and confusion-less deciphering is extremely important in the present society. Incorrect reading of hand written notes may lead to disaster. In these two points, "SUS" has got the natural advantage. Since written with minimum number of simple strokes, it can be written very swiftly. Also since the various scripts are identified by the location of their components in distinctly different places, there is almost no possibility of confusion in deciphering.

(05) TYPING : In these days, men are being increasingly dependent on typed scripts, than handwriting. Some, if not all, of the traditional scripts have one or other sort of problems in typing. Complexities arise in typing due to two major reasons, (01) Number of letters and (02) Existence of special requirements like Vowel signs, Combined letters etc.

As for number of letters, English has a total number 104 scripts (Capital Typing 26, Small Typing 26, Capital Handwriting 26 and Small Handwriting 26). The typewriters have used double shift keys to manage this large number. Even though Bengali has got less number of letters (Consonant 35, Vowel 11), in typing it is even more difficult because there are vowel signs (which need to be used before, after, both before and after, above and below the scrip), combined letters and combined letters with vowel signs. All these have rendered its scripts quite difficult to type. If all these characters are needed to be typed independently, then the number of letters is comparatively less, it is 28. But the use of vowel signs above and below the scripts has turned its typing also complex.

Computer key boards have simpler solution to take care of the number of scripts. But still the above special characteristics (i.e. specialized use of vowel signs and combined scripts) make typing by computer keyboard quite slow and difficult. In spite of large number of scripts (usually 26 + 26 = 52), typing English is relatively easy because of less number of script (26 double shift keys) and no use of vowel signs or combined letters.

Since "SUS" is written with only 4 strokes and the same stroke is used at various locations (which can be easily done by navigation key), it can be typed with extremely small number of keys. For the letter scripts, the language using only letters and vowel sign, the job can be done with only 16 (keeping 10 independent keys for the digits) or less number of keys. However, the exact number would depend upon the number of letters and the technology to be used.

For example, an alphabet with say 45 letters would need total 11 keys (9 keys for the group heads, 1 key for small vertical stroke and 1 navigation key). Even though the digits can be written by smaller

number of keys in "SUS" script, it is better to use 10 keys independent for them. Thus the total number of keys for the scripts comes to only 21.

For languages having modifiers, another 15 to 16 keys may be required. However, huge number of keys is required for the language having combined letters (like Bengali). At present such languages either use computer technology for combining letters or avoid such combinations. It is obvious that the second option is better for attaining simplicity and speed in typing.

It may be mentioned here that in "SUS" the number keys can be further lowered by using other technologies. Thus the letterheads can be composed by only two keys, 1 normal key and 1 navigation key. If the same navigation key can be used for both purposes then the number of keys comes to only 5 (4 normal keys and 1 navigation key). It may however, be a matter of investigation whether it is easier to write with less or more number of keys. However, keyboard with less number may be advantageous for the Blind people. Also, it may have advantage in mobile phones.

"SUS" may have another advantage in mobile phone. The manufacturer can use here only one set of script for writing all languages, as compared to one set of scripts for each language.

(05) PRINTING : In printing problems arise in a number of factors, prominent among which are (i) scripts with varying width, scripts having signs at different locations, combined letters etc. "SUS" is free from all these problems because all of its scripts are enclosed in a square box.

FURTHER DEVELOPMENT OF LANGUAGES :

It may be mentioned here that in spite of the simplicity and fluidity of the "SUS" scripts, languages having inherent problems would not be able to avail its benefit. Some of the weaknesses observed in some languages are :

- (i) Use of vowel signs, (ii) Use of combined letters, (iii) Use of duplicate or triplicate letters having nearly the same and "distinguishable with difficulty" type of sounds. While Arabic language has got the first weakness, Bengali has got all. For this reason, in spite of its excellent sound, Bengali is considered as one of the most difficult languages. Some of the problems faced by this languages are :
- (a) The children need longer time to learn the scripts constituted of all types of lines (straight, curve, elliptical) used in all angles and moving in both directions (clockwise and anti-clockwise).

Because of this reason quite often their hand writings fall under criticisms due to : illegibility, ugliness. A great number of students find learning this language problematic because of its difficulty in writing.

(b) The language users frequently fall victim of "spelling mistake" because of the existence of "similar sounding letters". The principle reason for which the foreigners are discouraged to learn this language is the fear of "spelling mistake".

With the acceptance of "SUS", some problems of Bengali language (like, long time required for learning the scripts, criticism of illegibility, difficulty in deciphering, bad handwriting etc.) will be instantly eliminated. However, the speed or fluency in writing will not be much improved because of the existence of vowel signs and combined letters. It is now a proved fact that a language using only letters and no vowel signs can run smoothly in all spheres and English is its best example. Bengali can easily be benefitted by abandoning the vowel signs and combined letters. The fortunate part is, in Bengali there are provisions for their substitute's right inside the alphabet.

As language Bengali will not be free from another serious lacking known as "Spelling mistake". It has been stated that it happens due to the presence of more than one similar sounding letters. It may sound hilarious to note that this great problem can be solved only by dropping the few similar sounding letters and signs.

If the users of Bengali language think of improving its learning, writing and typing processes and find that "SUS" may be helpful for them, they may also consider some simple changes that would make their script one of the best in the world.

From a firsthand consideration we have endeavored to simplify Bengali alphabets by (i) dropping some similar sounding letters and signs, (ii) abandoning the use of vowel-signs and (iii) eliminating combined letters. This simplified Bengali alphabet has been shown in Fig. No. 21 below.

Ф (Ka)	শ(Kha)	গ (Ga)	ঘ্ (Gha)	E (Uma)
G (Cha)	ष्ठ्(Chha)	জ(Ja)	ব। (Jha)	र्ग(Ya) / भ(Nia)

Fig. No. 212. Bengali Alphabet.

ট (Ta)	ð (Tha)	ए (Da)	G (Dha)	ন (na*)/ণ(Na)
ق(ta*)	श्(tha*)	ቫ (da*)	ধ _(dha*)	হ (Ha)
A (Pa)	که (Fa)	ব (Ba)	S (Va)	स्र _(Ma)
স _(Sa)	শ(sha)/ৰ(Sha)	ব(ra)	بو(Rha) / و(Rhha)	ल _{(la}
অ (a)	স (AA)	र्द्र (EE) / ज्ञे(EEE	উ(u) / ভ (00)	In between A and A
		—		
1 (E)	OI) و	3 (0)	3 (OU)	• (Bisarga)
্ হসন্ত	ChandraBindu			

With the above mentioned 41 scripts (Consonant and Vowel letters and signs) it is possible to write Bengali free from the hazards of "illegibility", "bad handwriting" and "spelling mistake". If the same is done then by all possibilities Bengali may become one of the swiftest language of the world, retaining however, all of its nice sounds (i.e. vocal language).

CONCLUSION :

"SUS" is not a language, it is only a script capable of writing many, if not all, languages. It has been specially designed such that its use may, in no way, bring any change in the vocal language. The scripts have been designed with simple lines and those are to be used following one simple principle, such that the children or adult learners can learn those at ease and can recreate those even if forgotten.

Men first discovered vocal language. Then they felt the need for conveying those to distant places and started using various written signs to denote various sounds (words or letters). In the following stage they picked up the basic sounds of the language (Letter) and designated signs or scripts for each of those. Men living in various regions and speaking in various languages invented their own alphabets and scripts. Due to long time use the scripts also have achieved some sort of emotional attachment. Thus even though they felt many of the scripts problematic, they did not change or modify those, excepting in a few cases. This trend has got both positive and negative contributions as described below.

POSITIVE : The positive contribution is, in case they would have accepted the scripts of another language, their vocal language would have been changed, meaning in fact, the death of their language. As human being we want all the languages to live and flourish.

NEGATIVE : Not all the scripts invented by men's ancestors are equally easy to use and speedy to write. When one language lags far behind another language, the users of this language are at times compelled to accept the scripts of the superior language. Due to this reason a number of languages have abandoned their traditional scripts and accepted English (i.e. Roman) script. "Hausa" language of Nigeria is one such language who could no more continue with their previous script (that was formulated after Arabic scripts) and opted for English alphabet. We know, in Bangladesh, more and more people are using English because of some inherent problems of their own language. Now if the Bengali users for any reason abandon Bengali script and accept English script, there will be great changes in their vocal language. It would in fact cause partial or full death of their beloved language. "SUS" is capable of keeping their vocal language exactly the same, making its learning easy, writing speedy and typing hazard-free and thus making it fit for competing with any language of the world.

In the contemporary world language is considered as a tool for conveying ideas. So, the easier way it can be conveyed, the better it is for all concerned. By this consideration reformation of the slow writing and problematic languages is a must. Since men retain profound love and attraction for their mother tongue, by all means it should not be changed. But there can be no logical reason to retain the problematic, confusing and slow scripts, where we know that the scripts act merely as carry bag for

language. On the other hand, the languages that cannot cope with the fast and modern languages have been found to be increasingly dependent on other languages and ultimately to face death or merger.

If the users of any language feel that their language can be written, typed and printed more easily through "SUS", however, keeping the original sound and dialects as it is, then they should not have any reservation to accept it. If the users of any language can find out that "SUS" is capable of reducing the time of child education by 50% to 75%, then they should consider what huge quantity of time and stationary their country can save by accepting it. It is obvious that if one user can find out this benefit then those not using the same would feel hard competition.

One extremely interesting point is, if the children (i.e. new learners) are given an option to choose between the traditional script and "SUS" there is every possibility that they would prefer "SUS".

English language could attain speed, fluidity and wide acceptability because of use of only words, and no vowel sign or combined letters. Being influenced by its obvious advantages some other languages (e.g., Italian, Spanish, German, French, Hausa etc.) also have changed their previous scripts. In doing so they definitely had to accept some changes in the sounds of their languages also. As a great deviation or advantage, "SUS" causes absolutely no change in vocal language or sounds.

It is no wonder that any user of English, Arabic or Bengali language would feel the SUS script as alien and to some extent, skinny. It happens so because they have long been accustomed to writing figurative scripts. The same will not be the case with the users of Chinese, Japanese and Korean languages, who are accustomed to writing by strokes. The fact is whatever peculiar any new script may look like, after customization those turn to "close relatives". Same is the case with SUS scripts also. It has already been proved that stroked alphabets find absolutely no problem in writing any types of literary, scientific or technical papers with their alphabets.

Once a person becomes proficient in SUS, he will not feel any other language written by this script as alien. He however, would not be able to read this language unless and until he can identify the sounds of these scripts in that language. But as soon as he can learn those sounds, he does not need to do anything more to learn its writing, because he already knows it. This advantage is capable of removing the greatest hindrance (learning to write) on way to learning other's languages.

SUS, the latest unified script is now in the field and it is fully prepared in to accept challenge. Its acceptability definitely depends upon its efficiency which will be revealed from time to time. Definitely the people would accept it if it is advantageous and beneficial. The language users rich in emotion may feel reluctant to accept SUS on the plea that it might strangulate their long nurtured and

scripts. Even if it may be a good reason for rejecting SUS, saving the learner's pains and time and huge quantity of scarce resources of this earth may still be a good reason in favor of its acceptance.

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