

## 4.8 Databyte Equipment Pvt. Ltd.

### Introduction

DATABYTE was founded by a group of engineers from IIT/BARC/TIFR in 1981.

Since 1988, we have been involved in development work related to Indian languages.

Among other things, we have developed and currently manufacture

1. Bilingual Message Terminals.
2. Microprocessor based Multilingual MOVING TEXT DISPLAY SYSTEMS with embedded editor for Devnagari, Bengali, Gujarati, Telugu, Tamil, Malayalam, Kannada, Punjabi, Oriya, Assamese, Kashmiri, Sindhi, Arabic etc.
3. Multi-lingual keyboard driver for WINDOWS.

A common keyboard overlay for all Indian and other scripts has been developed. This overlay called LIPIKAR is such that anyone already proficient in typing on English keyboard (QWERTY or any other) can start typing in script of his choice without having to learn a new overlay.

LIPIKAR overlay is applicable for all Brahmi based scripts : Devnagari, Bengali, Tamil, Telugu, Assamese, Gujarati, Kannada, Malayalam, Oriya, Punjabi and Perso Arabic based Scripts : Urdu, Sindhi & Kashmiri. The overlay is universal in nature and can be adapted for most other scripts of the world.

As an off-shoot of Lipikar, a universal intermediate script for all Indian and other scripts has been developed. This script has been called LISI.

LISI uses only printable ASCII character set and even if one sees the typed text of an Indian or other script in LISI (plain English), one can read it with ease.

The script allows single web search for articles of different scripts posted in LISI. The script can support all 8-bit and Unicode fonts available from different vendors and can serve as an intermediate script for conversion of text in font of one vendor into font of another vendor. The code also enables trans-literation of text from one script to another.

**LIPIKAR** (A universal keyboard overlay for all Indian and other scripts)

&

**LISI** (Language Independent Script for Internet)

### LIPIKAR

A universal keyboard overlay for all Indian and other scripts \*

State of Art

At present, many different keyboard layouts are in use. Some of the prominent ones are...

Inscript	Asterix	Eng	Itr	Newroma	Script
Abitr	Compset	Godrej	K_P_Rao	Rajya	Script1
Akruti	Crtronic	Godrej1	Mtnk	Raming	Srg
Akshar	Devyani	Indica	Naidunia	Raming	Typewrit
Apple	Doe	Inscript	Network	Roma	

All these overlays require considerable practice and familiarity before one can use them effectively. One also has to necessarily put stickers or print otherwise the Indian script legends alongside the English legends on the key tops.

In addition there are some phonetic or “type as you spell Eng” keyboard layouts. These layouts, owing to inherent ambiguities, are not simple to understand and use. Their providers themselves do not recommend them for regular use for Indian scripts.

## 1. LIPIKAR Overlay

LIPIKAR keyboard overlay is very simple to understand and use. Once the basic approach is understood, anyone knowing English typing can start typing in any of the Indian languages without any training. It does not require any overlay stickers etc. to be put on the QWERTY keyboard.

Though it uses same basic keys for English and Indian scripts, it is not a phonetic keyboard. There is absolutely no ambiguity. There is a specific key-stroke for each of the alphabets, matras, vowels and special characters of the script. The same overlay is applicable for all Indian scripts, Perso Arabic based Scripts and other scripts.

The LIPIKAR keyboard overlay has been designed to achieve the following objectives...

The same keyboard overlay is applicable for all Brahmi based scripts : Devnagari, Bengali, Tamil, Telugu, Assamese, Gujarati, Kannada, Malayalam, Oriya, Punjabi and Perso Arabic based Scripts : Urdu, Sindhi & Kashmiri. The overlay is universal in nature and can be adapted for most other scripts of the world.

Any one knowing English typing will be able to type in any script of his choice with ease.

It is so simple to understand and use that one need not put overlay stickers on the English (QWERTY and others) keyboard.

Unlike some “phonetic” overlays, there is absolutely no ambiguity in its usage. There is a specific key-stroke for each of the alphabets, matras, vowels, special characters and alternate forms of characters. It can be easily adapted for most scripts.

It is suitable for bilingual (English and selected script) text.

It requires minimum number of strokes to type the text precisely. It uses only basic printable English alphabet, leaving most of the punctuation and special symbols free for use in the bilingual text.

It incorporates provision to accommodate alternate forms, derivative forms and special characters that may be available in a script.

Typing in LIPIKAR is strictly spelling based and is not affected by the conjuncts (character forms representing combination of multiple alphabets) that may be available in a script.

Typing Devnagari text with LIPIKAR

For all primary characters type corresponding English keys.

For क ग च ज त द न प ब म य र ल व स ह

Type k g c j t d n p b m y r l w s h

e.g. कमल = kml नयन = nyn परम = prm

For derived characters, type Shift + corresponding primary characters.

For ख घ छ झ थ ध ण फ भ क श

Type K G C J T D N P B L S

e.g. घर = Gr रथ = rT

For ट, ठ, ड, ढ, ष type corresponding character twice.

For ट ठ ड ढ ष

Type tt TT dd DD SS

e.g. डर = ddr मटर = mttr

Matras have been assigned to corresponding English vowels.

For ा ि ि ु ू े ै ो ौ

Type a or Ai I u U e E o O

e.g. सुनिता = sunita देवी = dewI कौशल = kOSI

To get a Vowel character, type the corresponding Matra twice.

For अ आ इ ई उ ऊ ए ऐ ओ औ

Type aa AA ii II uu UU ee EE oo OO

e.g. आवाज = AAwaj उषा = uuSSa

For Special characters, type ; and corresponding primary character.

For ॐ क्ष ज्ञ ङ ञ ऋ श्र त्र ऽ ॰ ॱ

Type: a ;c ;g ;G ;j ;r ;s ;t ;5 ;e ;o

e.g. ऋतु = ;rtu श्रम = ;sm

Additional Characters

For ˆ ˜ | ˘ ˙ ˚ or ˛

Type \* ^ \ : . R RR

e.g. बैंक = b^k क्रम = kRm ट्रक = ttRk

For Half Character type ‘ (Single Quote) e.g. For क type k’

To force a character in Halant form type ‘ (Single Quote) twice. e.g. For क् type k’’

For Dot Space type ~

LIPIKAR is more fully defined in table I, table II and table III.

Examples of typing in Devnagari

किमान	kiman	गरम	grm	कैल्य	kEwl’y
सेवा	sewa	गणेश	gNeS	गर्म	gr’m
समाज	smaj	कमल	kmL	कन्नड	kn’ndd
कुणाल	kuNal	दुःख	du:K	बक्ति	w’yk’ti
एक	eek	प्रेम	fRem	अग्नि	aag’ni
फूल	ful	प्रेषित	pReSSit	बुद्धा	bud’Da
अंक	aa*k	प्रभाव	pRBaw	अद्भुत	aad’But

चांद	ca*d	ट्रक	ttRk	विश्व	wiS’w
ईंट	ii^tt	कर्म	kr’m	विठ्ठल	wiTT’TTl
उज्वला	uuj’wla	पर्याय	pr’yay	एडवोकेट	;eddw’hokett
आभाळ	aaBaL	वर्षा	wr’SSa	विद्यार्थी	wiD’yar’TI
केवडा	kewdda	शर्मिली	Sr’milI	कृष्णा	kRRSS’Na
करुणा	kruNa	वाऱ्या	wr’ya	हृदय	hRRdy
संगम	s*gm	कॅप्टन	k;epttn	उर्दु	uur’du
विक्रम	wikRm	कॉमेड	k;omRedd	अर्जुन	aar’jun
वाङ्मय	wa;G’mY	महत्व	mht’w	क्षितीज	;citIj
खोज	Koj	प्रदिप	pRdip	ज्ञान	;gan

मेरा भारत महान mera Bart mhan

जिस देश मे गंगा बहती है । jis deS me g\*ga bhtI hE\

Special feature to accommodate alternate & derivative forms of an alphabet

Some scripts have alternative forms of same characters such as श & ष in Devnagari and \* & Ç in Urdu.

LIPIKAR uses four mechanisms to represent alternative forms, derivatives and similar alphabets...

- Shifted position. e.g :- s = स , S = श ; n = न , N = ण
- Multiple pressing of a key to get successive alternate forms.  
e.g :- S = श , SS = ष ; kR = क्र , kRR = कृ
- Pressing one or more dots after the character to get successive alternative forms.  
e.g :- j = ज , j. = ज़ ; y = य , y. = य
- Pressing ; before the character for special derived characters.  
e.g :- ;g = ज्ञ , ;c = क्ष

- Since English has only one character T to correspond to त & ट, and one character D to correspond to द & ड, LIPIKAR treats ट & ड as alternative form of त & द.
- Thus one types t, T, d, D for त, थ, द, ध & tt, TT, dd, DD for ट, ठ, ड, ढ.
- Note :- In a particular script, if multiple occurrences of an alphabet has not been assigned any specific meaning then instead of that alphabet followed by a dot (Nukta) one can also type that alphabet twice. Thus... In Devnagari ...  
k. = क.; g. = ग; S. = ष; d. = द; dd = ड

In Urdu... j. = ज; j.. = ज; j... = ج; j.... = ظ; s. = س; s.. = س

#### Typing text in other Brahmi based scripts

Since LIPIKAR is based on precise spelling and not on any specific conjuncts of a script, typing in any Brahmi based script is identical to typing in Devnagari as described earlier. Table II shows how same LIPIKAR is applicable to Devnagari, Bengali, Tamil, Telugu, Assamese, Gujarati, Kannada, Malayalam, Oriya, Punjabi.

#### Typing in Perso Arabic based Scripts : Urdu, Sindhi & Kashmiri

Typing in Perso Arabic based scripts is again very similar to typing in Devnagari except the following:

Perso Arabic based scripts do not have separate alphabets for derived or aspirated sounds. Such sounds are generally represented by adding “h” to the primary alphabet. For these scripts, Lipikar allows one to type either shift + primary alphabet or Primary character + h.

Table III compares typing in Devnagari and Urdu using LIPIKAR.

#### Bilingual Text

LIPIKAR allows mixing of English words with the script of one’s choice in the same document. “CapsLock OFF “ selects English & “CapsLock ON “ selects the other script.

#### Implementation of LIPIKAR in Databyte’s moving display system

We have incorporated LIPIKAR in our moving text display system called BizBooster. BizBooster supports all Indian scripts. For the last three years, all our users of BizBooster are able to enter text in the script of their choice using LIPIKAR overlay after an initial briefing of 15 minutes.

#### 2. LISI

##### Language Independent Script for Internet \*

An important by-product of Lipikar is LISI.

While using LIPIKAR overlay to type in an Indian Script, What one type will directly generate the text in LISI.

e.g.

For... एक नया सुरज निकला, जग मे उजियारा छा गया ।  
one will have to type... eek nya surj nikla, jg me uujiyara Ca gya \

which is... एक नया सुरज निकला, जग मे उजियारा छा गया in LISI code.

Table II, Table III, Table IV and Table V fully define LISI in conjunction with LIPIKAR.

#### State of Art

There is no such intermediate script which can support all Indian scripts, Perso Arabic scripts and possibly many other scripts of the world is available.

Having a directly coupled keyboard overlay common to all supported scripts enhances its usefulness many fold.

### Main achievement of LISI

The LISI script and code have been designed to achieve the following objectives...

Text in LISI should pass through any system or communication channel that can handle printable ASCII character set.

The script is such that, in absence of any suitable converter program, even if one sees the typed text of Indian script in LISI (plain English), one will be able to read it with ease. Even if some one not familiar with LISI sees a text in LISI, he will be able to read it with minor aberration.

One can use LISI to chat over the internet or other media.

The two users engaged in “chat” need not have compatible fonts from the same vendor selected.

The script can support all 8-bit and Unicode fonts available from different vendors and can serve as an intermediate script for conversion of text from font of one vendor into text in font of another vendor.

At present almost all software for Indian scripts use font encoded text which is not suitable for web search. Though UNICODE takes care of “font encoded” problem, it does not allow single search for all Indian scripts.

If all the web sites which support Indian Languages start posting information in LISI, a single search will identify all the articles available in all LISI supported scripts.

° By being the intermediate script for interchange, LISI allows easy transliteration of text from one script to another.

### Chat over Internet

One can use LISI to chat over the internet or other media. The two users engaged in “chat” need not have compatible fonts from the same vendor selected. They only need to have the

“LISI to selected font” converter program activated.

Even if the receiver does not have a suitable LISI to Script converter program installed, as LISI uses only printable character codes, he will see readable ASCII text on his screen and can precisely read the content. He can even convert the saved chat into script-font of his choice later.

### Single web-search for all Indian scripts

At present most solutions for Indian scripts use font encoded text which are not suitable for web search. Though UNICODE takes care of ‘font encoded’ problem, it does not allow single search for all Indian scripts.

Today if anyone wants to search all information available on Mahatma Gandhi in various Indian Languages, there is no way. Even if all the web sites were using UNICODE, one will have to conduct a separate search for each script.

If all the web sites which support Indian Languages start posting information in LISI...

A single search will identify all the articles available in all LISI supported text.

- A user can download a file in LISI and then convert it into font of his choice.

### Unification of all Fonts for all Indian scripts

LISI can supports all 8-bit and Unicode fonts available from different vendors giving the user a wide choice. In contrast Unicode severely restricts the choice of fonts available to the user.

If every vendor of fonts for Indian script starts offering a converter between his font and LISI, then converting a text file from one font to another will become quite simple. One has to first convert the original text file to LISI and then LISI file can be converted to any other font of one’s choice.

Can Speak but Can’t read or write

Today a sizable urban population can speak the regional language but can not read the script much less write in it. Need to communicate in Indian scripts being so occasional, they certainly do not have the patience to learn any of the keyboard overlays available from vendors of Indian script packages. With LIPIKAR and LISI, such neo-literate can write a letter to their parents in their regional language using Devnagari or any other script they know and then print it in the script their parents know. Imagine a mother's delight in receiving a letter from her son that she can read herself instead of having it read by the neighbor.

Imagine if all the rich literature available in Urdu is put on internet in LISI, people can download it and print it in Devnagari or any regional script they know.

#### Conversion between Perso Arabic based Scripts and Brahmi based Scripts

To facilitate such conversion, every font designer must provide, if not already provided, a dot-space in his font. As the name implies, a dot-space is space character having a width of one dot. Its use is explained below.

Some scripts have multiple forms of same characters such as, श & ष in Devnagari and ث & ٰ in Urdu.

Multiple occurrence of an alphabet in LISI implies successive alternate form of the corresponding character. e.g. S. means 2nd form of S and S.. means 3rd form of S

While converting from LISI to a script, if the script does not have 2nd or 3rd of the preceding alphabet, use its first form but put dot-spaces in place of unused repeat characters in the script file. While converting back from script file to LISI, the dot-spaces are converted back into preceding characters. Thus when this script text is converted back to LISI and then to the original script (say Urdu), one will get back the text one

started with. The advantage of dot-space is that without affecting readability of the converted text, it indicates use of specific alternative form in the original text.

If the text actually happens to have the same alphabet coming one after other, they are separated by "-" in LISI. Thus, while converting from text to LISI, separate successive occurrence of an alphabet by "-".

If the text actually has a "-" separating same alphabet, while converting from text to LISI, put two "-".

While converting from LISI to text, remove first "-" separating same alphabet.

Sample text in Devnagari & LISI.

अयोध्या के राजा दशरथ के चार बेटे थे । पहले बेटे राम का विवाह जनकपुर के राजा की बेटी सीता से हुआ ।

दूसरे बेटे लक्ष्मण का विवाह उर्मिला से हुआ.....

aayoD'ya ke raja dSrT ke car bette Te \ phle bette ram ka wawah jnkpur ke raja kI bettI slta se huAA\

dusre bette l;cmN ka wawah uur'mila se huAA .  
.....

Note the...

Easy readability of text even in plain LISI.

The fewer strokes required to type the text in LIPIKAR/LISI.

#### Bilingual Text

LISI supports mixing of English words with the script of one's choice in the same document. While converting Bilingual text to LISI, put '(reverse quote) before each English word.

Conversion from LISI to Font and from Font to LISI

Table IV gives a summary of conversion from

text in LISI to text in some font.

Table V gives a summary of conversion from text in some font to text in LISI.

Table I : Summary of LIPIKAR overlay

Primary & Derived Characters							
For	Type	For	Type	For	Type	For	Type
क	k	च	c	त	t	ट	tt
ख	K	छ	C	थ	T	ठ	TT
ग	g	ज	j	द	d	ड	dd
घ	G	झ	J	ध	D	ढ	DD
ङ	;G	ञ	;J	न	n	ण	N
प	p	य	y	ह	h		
फ	P	र	r	स	s		
ब	b	ल	l	श	S		
भ	B	ळ	L	ष	SS		
म	m	व	v or w				

Matras				Vowels			
For	Type	For	Type	For	Type	For	Type
।	a	।	A	अ	aa	आ	AA
ि	i	ी	I	इ	ii	ई	II
ु	u	ू	U	उ	uu	ऊ	UU
े	e	ै	E	ए	ee	ऐ	EE
ो	o	ौ	O	ओ	oo	औ	OO

Special Characters				Additional Characters			
For	Type	For	Type	For	Type	For	Type
ॐ	;a	ँ	;e	ं	*		
क्ष	;c	ँ	;o	ँ	^		
ज्ञ	;g	ँ	;ee	ं	.		
ङ	;G	ऑ	;oo	ं	or ^	R	
ञ	;J	ँ	;E	ं	RR		
ऋ	;r	ौ	;O	ँ	r' or q		

श्र	;s	ऐ	;EE	=	r" or qq
त्र	;t	औ	;OO	:	
ऽ	;5				\

For half character type ‘ (Single Quote) e . g .  
For ळ type g’

To force a character in halant form type ‘ ‘ (Single Quote) twice e.g. For ळ type g ‘ ‘

For Dot space type ~

See Table II for a more complete specification of LIPIKAR overlay.

Table IV : Conversion from LISI to Font

Primary & Derived Characters							
LISI	FONT	LISI	FONT	LISI	FONT	LISI	FONT
k	क	c	च	t	त	tt	ट
K	ख	C	छ	T	थ	TT	ठ
g	ग	j	ज	d	द	dd	ड
G	घ	J	झ	D	ध	DD	ढ
;G	ङ	;J	ञ	n	न	N	ण
p	प	y	य	h	ह		
f	फ	r	र	s	स		
b	ब	l	ल	S	श		
B	भ	L	ळ	SS	ष		
m	म	w	व				

Matras				Vowels			
LISI Font	LISI	Font	LISI	Font	LISI	Font	LISI
a	।	A	।	aa	अ	AA	आ
i	ि	I	ी	ii	इ	II	ई
u	ु	U	ू	uu	उ	UU	ऊ
e	े	E	ै	ee	ए	EE	ऐ
o	ो	O	ौ	oo	ओ	OO	आ

Special Characters		Additional Characters	
LISI Font	LISI Font	LISI Font	LISI Font
;a	ॐ	;e	˘
;c	क्ष	;o	ँ
;g	ज्ञ	;ee	ँ
;G	ड	;oo	ऑ
;J	ज	;E	ँ
;r	ऋ	;O	ँ
;s	श्र	;EE	ऐ
;t	त्र	;OO	औ
;5	ऽ		।

**Rules & Example**

If a char is repeated beyond available alt forms, replace unused repeat chars by Dots

kk = क˘

Remove single “-” after conversion

S-S = शश

Convert “—” into “-”

S—S = श-श

Remove ‘ (Reverse quote) from start of English words

kml eek ‘flower hE = कमल एक flower है

Table V : Conversion from Font to LISI

**Primary & Derived Characters**

LISI	Font	LISI	Font	LISI	Font	LISI	Font
क	k	च	c	त	t	ट	tt
ख	K	छ	C	थ	T	ठ	TT
ग	g	ज	j	द	d	ड	dd
घ	G	झ	J	ध	D	ढ	DD
ङ	;G	ञ	;J	न	n	ण	N
प	p	य	y	ह	h		
फ	f	र	r	स	s		

व	b	ल	l	श	S
भ	B	ळ	L	ष	SS
म	m	व	w		

**Matras**

**Vowels**

Font	LISI	Font	LISI	Font	LISI	Font	LISI
।	a	।	A	अ	aa	आ	AA
ि	i	ी	I	इ	ii	ई	II
ु	u	ू	U	उ	uu	ऊ	UU
े	e	ै	E	ए	ee	ऐ	EE
ो	o	ौ	O	ओ	oo	औ	OO

**Special Characters Additional Characters**

Font	LISI	Font	LISI	Font	LISI
ॐ	;a	˘	;e	.	*
क्ष	;c	ँ	;o	ँ	^
ज्ञ	;g	ँ	;ee	.	.
ड	;G	ऑ	;oo	˘	or ^R
ज	;J	ँ	;E	ँ	RR
ऋ	;r	ँ	;O	ँ	r'
श्र	;s	ऐ	;EE	=	r''
त्र	;t	औ	;OO	ः	:
ऽ	;5			।	\

**Rules Example**

If repeat chars do not represent alt-form, separate them with “-”

ष = SS , शश = S-S , षश = SS-S

If “-” present in Devnagari text between same characters, make it “—”

श-ष = S—SS

Convert Dot Space into previous char.

क˘ = kk

Add ‘ (Reverse quote) at start of each English word.

कमल एक flower है = kml eek ‘flower hE



Table II : Shows how same LIPIKAR is applicable to Devnagari, Punjabi, Gujarati, Oriya, Bengali, Assamese, Telugu, Kannada, Malayalam, Tamil...

LIPIKAR

Key Strokes	LISI	DEV	PNJ	GJR	ORI	BNG	ASM	TLG	KND	MLM	TML
k	k	क	ਕ	ક	କ	ক	ক	క	ಕ	ക	க
k.	k.	क़	ਕ਼	-	-	-	-	-	-	-	-
K	K	ख	ਖ	ખ	ଖ	খ	খ	ఖ	ಖ	ഖ	-
K.	K.	ख़	ਖ਼	-	-	-	-	-	-	-	-
g	g	ग	ਗ	ગ	ଗ	গ	গ	గ	ಗ	ഗ	-
g.	g.	ग़	ਗ਼	-	-	-	-	-	-	-	-
G	G	घ	ਘ	ઘ	ଘ	ঘ	ঘ	ఘ	ಘ	ഘ	-
c	c	च	ਚ	ચ	ଚ	চ	চ	చ	ಚ	ച	ச
C	C	छ	ਛ	છ	ଛ	ছ	ছ	ఛ	ಛ	ഛ	-
j	j	ज	ਜ	જ	ଜ	জ	জ	జ	ಜ	ജ	ஐ
j.	j.	ज़	ਜ਼	-	-	-	-	-	-	-	-
J	J	झ	ਝ	ઝ	ଝ	ঝ	ঝ	ఝ	ಝ	ഝ	-
t	t	त	ਤ	ત	ତ	ত	ত	త	ತ	ത	த
T	T	थ	ਥ	થ	ଥ	থ	থ	థ	ಥ	ഥ	-
d	d	द	ਦ	દ	ଦ	দ	দ	ద	ದ	ദ	-
D	D	ध	ਧ	ધ	ଢ	ধ	ধ	ధ	ಢ	ധ	-
n	n	न	ਨ	ન	ନ	ন	ন	న	ನ	/	ந
n.	n.	ऩ	-	-	-	-	-	-	-	-	ன
N	N	ण	ਣ	ણ	ଣ	ণ	ণ	ణ	ಣ	ണ	ண
tt	tt	ट	ਟ	ટ	ଟ	ট	ট	ట	ಠ	ത	ட
TT	TT	ठ	ਠ	ઠ	ଠ	ঠ	ঠ	ఠ	ಠ	ഠ	-
dd	dd	ड	ਡ	ડ	ଡ	ড	ড	డ	ಢ	ധ	-
dd.	dd.	ड़	ਡ਼	-	ଡ଼	ড়	ড়	-	-	-	-
DD	DD	ढ	ਢ	ઢ	ଢ	ড	ড	ఢ	ಢ	ധ	-
DD.	DD.	ढ़	ਢ਼	-	ढ़	ড়	ড়	-	-	-	-
p	p	प	ਪ	પ	ପ	প	প	ప	പ	പ	ப
f or P	f	फ	ਫ	ફ	ଫ	ফ	ফ	ఫ	ಫ	ഫ	-
f. or P.	f.	फ़	ਫ਼	-	-	-	-	-	-	-	-
b	b	ब	ਬ	બ	ବ	ব	ব	బ	ಬ	ബ	-

LIPIKAR

Key Strokes	LISI	DEV	PNJ	GJR	ORI	BNG	ASM	TLG	KND	MLM	TML
B	B	भ	ਭ	ଭ	ଭ	/	/	ਭ	ಭ	ഭ	-
m	m	म	ਮ	ମ	ମ	ম	ম	ਮ	ಮ	മ	ഥ
y	y	य	ਯ	ਯ	ਯ	য	য	ਯ	ಯ	യ	ധ
y.	y.	यु	-	-	ਯ	য	য	-	-	-	-
r	r	र	ਰ	ਰ	ର	র	ৰ	ਰ	ರ	ര	ര
r.	r.	रु	-	-	-	ৗ	-	ര	-	റ	റ
l	l	ल	ਕ	ਲ	ਲ	ল	ল	ਲ	ಲ	ല	ല
L	L	ळ	-	ਲ	ਲ	ৗ	-	ਲ	ಲ	ള	ள
L.	L.	ऴ	-	-	-	ৗ	-	-	-	ഴ	ഴ
v or w	v	व	ਮ	ਵ	ਵ	ব	ব	ਵ	ವ	വ	വ
S	S	श	o	ਸ਼	ਸ਼	শ	শ	ਸ਼	ಶ	ശ	-
SS or S.	SS	ष	-	ਸ਼	ਸ਼	ষ	ষ	ਸ਼	ಷ	ഷ	ഷ
s	s	स	n	ਸ	ਸ	স	স	ਸ	ಸ	സ	സ
h	h	ह	p	ਹ	ਹ	হ	হ	ਹ	ಹ	ഹ	ഹ
<b>Matras</b>											
a	a	।	।	।	।	।	।	।	।	।	।
i	i	ि	ਿ	ি	ি	ি	ি	ি	ി	ി	ി
I	I	ी	ੀ	ੀ	ੀ	ী	ী	ੀ	ೀ	ീ	ീ
u	u	ु	ੂ	ੂ	ੂ	ু	ু	ੂ	ು	ു	ു
U	U	ॄ	ॄ	ॄ	ॄ	ৄ	ৄ	ॄ	ॄ	ॄ	ॄ
e	e	े	ੇ	ੇ	ੇ	ে	ে	ੇ	ে	േ	േ
E	E	॑	॑	॑	॑	৑	৑	॑	॑	॑	॑
o	o	े	ੇ	ੇ	ੇ	ে	ে	ে	ে	ോ	ോ
O	O	॑	॑	॑	॑	৑	৑	॑	॑	॑	॑
^	^	॑	-	॑	॑	৑	৑	-	-	-	-
*	*	॑	॑	॑	॑	৑	৑	॑	॑	॑	-
.(Nukta)	.	॑	॑	॑	॑	৑	৑	॑	॑	॑	॑
(halant or half)	ˆ	॑	॑	॑	॑	৑	৑	॑	॑	॑	॑
:	:	॑	-	:	:	৑	৑	॑	॑	॑	॑
\	\	।	।	।	।	।	।	.	.	.	.

Vowels

aa	aa	अ	ਅ	ਅ	ଅ	ब्र	ब्र	उ	उ	आ	आ
AA	AA	आ	ਆ	आ	आ	ब्रा	ब्रा	ऊ	ऊ	आ	आ
ii	ii	इ	ਇ	ई	ई	ई	ई	इ	इ	इ	इ
II	II	ई	ਈ	ई	ई	ई	ई	ऊ	ऊ	इ	इ
uu	uu	उ	ਉ	उ	उ	उ	उ	इ	इ	उ	उ
UU	UU	ऊ	ਊ	ऊ	ऊ	उ	उ	इ	इ	उ	उ
ee	ee	ए	ਏ	ए	ए	ए	ए	इ	इ	ए	ए
EE	EE	ऐ	ਐ	ऐ	ऐ	ए	ए	इ	इ	ए	ए
oo	oo	ओ	ਓ	ओ	ओ	उ	उ	इ	इ	उ	उ
OO	OO	औ	ਔ	औ	औ	उ	उ	इ	इ	उ	उ

Miscellaneous

r ' or q	r ' or q	र	ਰ	र	र	र	र	र	र	र	र
r '' or qq	r '' or qq	र	ਰ	र	र	र	र	र	र	र	र
' r or R	R	र	ਰ	र	र	र	र	र	र	र	र
' rr or RR	RR	र	ਰ	र	र	र	र	र	र	र	र

Special Alphabets & Matras

;a	;a	अं	ਅੰ	अं	अं	अं	अं	अं	अं	अं	अं
;c	;c	क्ष	ਖ਼	क्ष	क्ष	क्ष	क्ष	क्ष	क्ष	क्ष	क्ष
;g	;g	ज्ञ	ਙ	ज्ञ	ज्ञ	ज्ञ	ज्ञ	ज्ञ	ज्ञ	ज्ञ	ज्ञ
;G	;G	ड	ਡ	ड	ड	ड	ड	ड	ड	ड	ड
;j	;j	ज	ਯ	ज	ज	ज	ज	ज	ज	ज	ज
;r	;r	ऋ	ਠ	ऋ	ऋ	ऋ	ऋ	ऋ	ऋ	ऋ	ऋ
;s	;s	श्	ਸ਼	श्	श्	श्	श्	श्	श्	श्	श्
;t	;t	त्र	ਤ	त्र	त्र	त्र	त्र	त्र	त्र	त्र	त्र
;e	;e	ए	ਏ	ए	ए	ए	ए	ए	ए	ए	ए
;ee	;ee	ऐ	ਐ	ऐ	ऐ	ऐ	ऐ	ऐ	ऐ	ऐ	ऐ
;o	;o	ओ	ਓ	ओ	ओ	ओ	ओ	ओ	ओ	ओ	ओ
;oo	;oo	औ	ਔ	औ	औ	औ	औ	औ	औ	औ	औ
;E	;E	ऎ	਌	ऎ	ऎ	ऎ	ऎ	ऎ	ऎ	ऎ	ऎ
;EE	;EE	एऌ	ਏ਌	एऌ	एऌ	एऌ	एऌ	एऌ	एऌ	एऌ	एऌ
;O	;O	ऌ	਌	ऌ	ऌ	ऌ	ऌ	ऌ	ऌ	ऌ	ऌ
;OO	;OO	आऌ	ਆ਌	आऌ	आऌ	आऌ	आऌ	आऌ	आऌ	आऌ	आऌ
;5	;5	ऽ	਽	ऽ	ऽ	ऽ	ऽ	ऽ	ऽ	ऽ	ऽ

Table III : Typing in Devnagari and Urdu using LIPIKAR

LIPIKAR	LISI	Devnagari	URDU
Key Strokes		(Hindi, Marathi, Nepali)	Basic, Start, Middle, End, Shosha
			Depending on the position of the alphabet within the word, LISI automatically selects the appropriate form
k	k	क	ک خ خ خ
k.	k.	क़	ق خ خ خ
K	K	ख	خ
K.	K.	ख़	خ
g	g	ग	گ خ خ خ
g.	g.	ग़	غ خ خ خ
G	G	घ	گ
;G	;G	ङ	ڱ
c	c	च	چ خ خ خ
C	C	छ	چ
j	j	ज	ج خ خ خ
j.	j.	ज़	ز
j..	j..	झ	ز
j...	j...	झ	گ خ خ خ
j....	j....	झ	ظ
J	J	झ	چ
t	t	त	ت خ خ خ

t.	t.	त	ط
T	T	थ	آ ٲ
d	d	द	د
D	D	ध	د
n.	n.	न	
N	N	ण	
tt	tt	ट	ٹ خ خ خ
TT	TT	ठ	آ ٲ
dd	dd	ड	ڈ
dd.	dd.	ड़	ڑ
DD	DD	ढ	ڈ
DD.	DD.	ढ	ڑ
P	P	प	پ خ خ خ
f or P	f	फ	پ خ خ خ
f. or P.	f.	फ़	ف خ خ خ
b	b	ब	ب خ خ خ
B	B	भ	آ ٲ
m	m	म	م خ خ خ
y	y	य	ی
y.	y.	य़	
r	r	र	ر
r.	r.	ऱ	
l	l	ल	ل
L	L	ळ	
L.	L.	ळ	
S	S	श	ش خ خ خ
S. or SS	S.	ष	ش خ خ خ
s	s	स	س خ خ خ
ٹ			
s.	s.	स	س خ خ خ
s..	s..	स	س خ خ خ
s...	s...	स	س خ خ خ
h	h	ह	ح خ خ خ

