

# Designing A Devanagari Font

Project 2 Final Presentation

By

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Under the Guidance of

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# Initial Idea of the Project

- Introduction to Type Design during Summer Internship by Manoj Gopinath, Joint Director, CDAC, Pune
- Designing A Variable Font for Devanagari Script



A screenshot of a font design tool interface. On the left, two rows of the Devanagari character 'A' are displayed. The top row shows five 'A's with varying weights and slants, and the bottom row shows five 'A's with varying weights. A vertical dashed line is on the right of the characters. On the right, a control panel includes: 'Line-height' with a slider; 'Alignment' with four icons; 'CSS' with 'New textbox' and 'Delete textbox' buttons; 'FONT VARIATIONS' with a refresh icon; 'Instance' with a dropdown menu set to 'Light (default)'; and 'Weight' with a slider set to 50 and a refresh icon.



# What is a Variable Font?

- Version 1.8 of OpenType font format specification introduced a new extension to the OpenType format known as OpenType Font Variations
- An OpenType variable font is a single font that can behave like several fonts by using continuous interpolation between different designs, all defined within the single font.

FLUIDO.

variable font

# Variable Font in Devanagari Script

- Variable Fonts is a relatively new and unexplored arena in Indic Scripts
- The Variable Devanagari Font should be
  - Monolinear
  - Not too Squarish Nor too Roundish
  - Usable in Different Contexts

# Initially Followed Process

- Study of Parameters considered in Devanagari Typeface Design
- Comparative Study of a few Monolinear Devanagari & Latin Typefaces
- Rendering the Glyphs

# Initially Followed Process

- Study of Parameters considered in Devanagari Typeface Design
  - Character Parameters
  - Structural Parameters
  - Width Parameters
  - Joinery Parameters
  - Proportional Parameters
- Comparative Study of a few Monolinear Devanagari & Latin Typefaces
- Rendering the Glyphs

## Character Parameters

Group 1 अ आओऔखगचजझजणतथधनपबभमयवस  
शषल  
Group 2 क फ  
Group 3 ड ईईउऊएऐटठडडह

## Width Parameters

Group 1 र 29x  
Group 2 वनडहईईएऐमब 34x  
Group 3 टठढदपषडत 36x  
Group 4 गघधभजयशथ 42x  
Group 5 चजझलसझउ 45x  
Group 6 कफणशक्षअ 49x  
Group 7 खऊछ 52x

## Structural Parameters

Group 1: अ आओऔरु Group 6: ट ठढद  
Group 2: ग नमभ Group 7: प फषण  
Group 3: क बव Group 8: र सख  
Group 4: इ ईडड Group 9: छ घध  
Group 5: य शयथक्ष Group 10: ज जच

## Joinery Parameters

Tangent joinery in different angle and thickness  
A vertical line joins a Horizontal line at 90 degrees  
Two curvilinear shapes joining horizontally  
Diagonal joining of contrast lines

## Proportional Parameters

Ascender Line  
Top Line  
height A  
B  
C  
Base line  
D  
Descender line  
8x  
16x  
8x

Image Source: Mohanty, S. K. The Formulation of Parameters for Type Design of Indian Scripts

# Initially Followed Process

- Study of Parameters considered in Devanagari Typeface Design
- Comparative Study of a few Monolinear Devanagari & Latin Typefaces
  - Weight, Contrast
  - Legibility at Different Sizes
  - Balance of Positive & Negative Space
- Rendering the Glyphs

# जीवनाशी एकरूप झालेले

एकत्र कुटुंबपद्धति: हिंदू समाजातील एक वैशिष्ट्यपूर्ण संस्था. हिंदूमध्ये एकत्र कुटुंब हे केवळ जास्त पिढ्यांचेच असते किंवा जास्त काळपर्यंत अस्तित्वात असते असे नसून, अशा कुटुंबास एक विधिमन्य दर्जा आणि त्यांच्या घटकांस काही वैशिष्ट्यपूर्ण अधिकार प्राप्त झालेले आहेत.

# एकवचन

यात्री कृपया ध्यान दे, फ्लॅटफॉर्म क्रमांक ६ से, ३ बजकर ४५ मिनीटकी अंधेरी जानेवाली, फास्ट लोकल आज फ्लॅटफॉर्म क्रमांक १ पर आणगी।

# 15 अगस्त 1947

‘दुनिया का नंबर एक खिलाड़ी बनूंगा!’  
वारकरी संप्रदायातील एक सुप्रसिद्ध संत

Mukta

मुक्ता

Harder to find a flaw, more observation needed

Smother than संचार देवनागरी

aesthetically more pleasant than Sanchar Devanagari

संचार देवनागरी लाईट

संचार देवनागरी रेग्युलर

संचार देवनागरी मिडियम

संचार देवनागरी सेमिबोल्ड

Sanchar Devanagari

संचार देवनागरी (ITM)

shorter knots and open loops (र)

slightly squarer than Mukta

more readability than Mukta when in smaller size (maybe because of the weight of the font)

# कैलाश मानसरोवर

इसके उत्तर में कैलाश पर्वत तथा पश्चिम में राक्षसताल है। कहा जाता है कि पर्वत पर साक्षात शिव और पार्वती निवास करते हैं।

# समुंद्र सतह

काठमांडू से सुबह-सुबह कैलाश के लिए सफर शुरू हो जाता है। काठमांडू से तकरीबन एक घंटे की यात्रा के बाद फ्रैंडशिप ब्रिज पर मानसरोवर यात्रियों की यहीं पर क्लियरेंस और पासपोर्ट की जांच चीनी अधिकारी करते हैं। यह पुल नेपाल

IDC Aashish

आइ डी सी आशीष

has inktraps (अ)

readable at small sizes

offers alternates, various weights, matrix

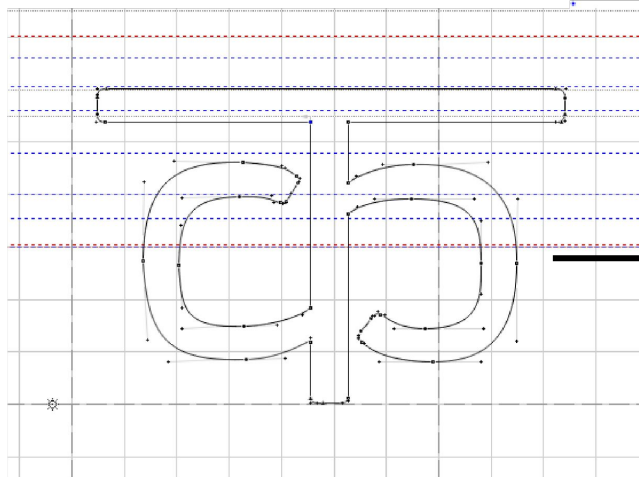
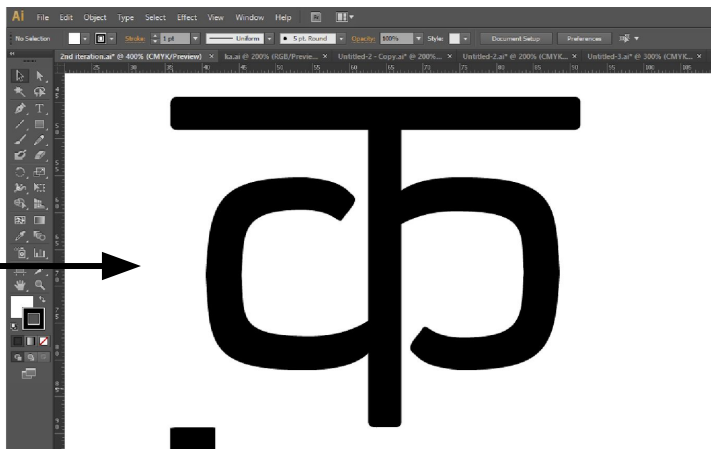
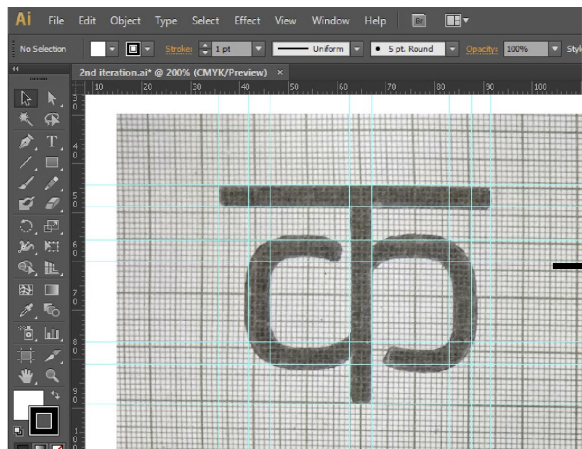
# Initially Followed Process

- Study of Parameters considered in Devanagari Typeface Design
- Comparative Study of a few Monolinear Devanagari & Latin Typefaces
- Rendering the Glyphs
  - Sketches on Paper
  - Rendering in Illustrator
  - Exporting them in FontLab & further Iterations

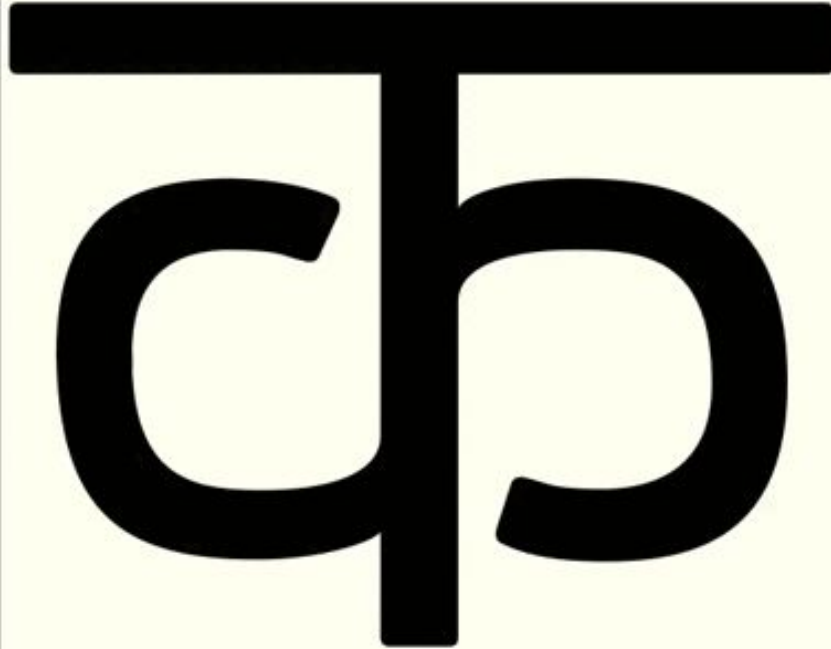
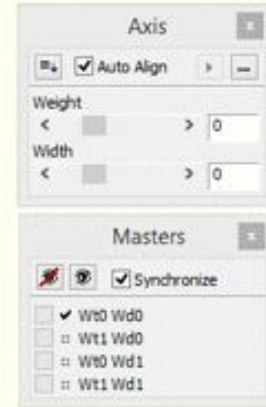
क क क क क क क क क क

क क क व क क क क

क क क क क अ इ



# Variable Font in Devanagari Script

A large, bold, black Devanagari character 'फ' (Pha) is displayed on a light yellow background. The character is rendered in a variable font style, showing a thick, uniform stroke width throughout, characteristic of a 'weight' variable font.

# At the End of Project 1...

10. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

15. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

20. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

25. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

30. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

36. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

40. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

48. कअफवबडइईझज्ञआओषऔपोडकिौडापीषी

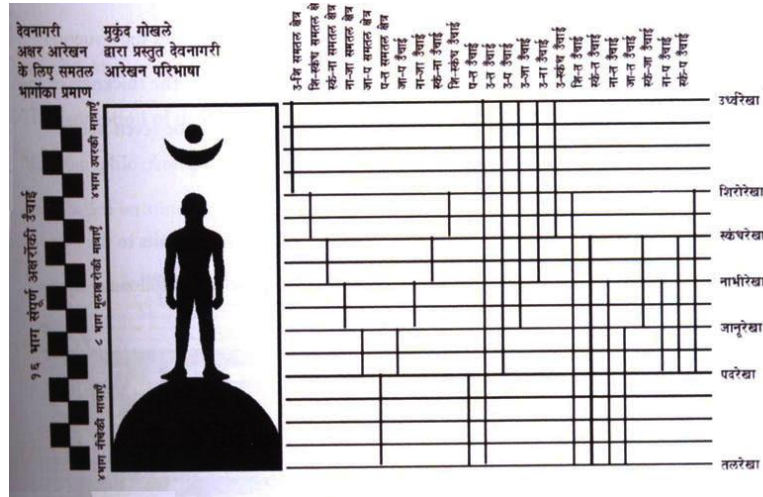
56. कअफवबडइईझज्ञआओषऔपोडकिौडापी

# Continuing the Project

- More Organised Approach
- Redefining the Aim : Designing a Devanagari Font
- Study of Anatomy of Devanagari Letterforms
- Creation of Grid
- Identification of Primitives
- Design & Redesign of Glyphs
- Constructing Conjuncts
- Constructing Samples (Words, Phrases, Sentences)

# Anatomy of Devanagari Letterforms

- Attempts to categorize Devanagari letters like Roman were started around 1961, notably by S. V. Bhagawat
- Followed by Bapurao Naik
- Mukund Gokhale created a Vocabulary for Devanagari in 1975-76



# Anatomy of Devanagari Letterforms

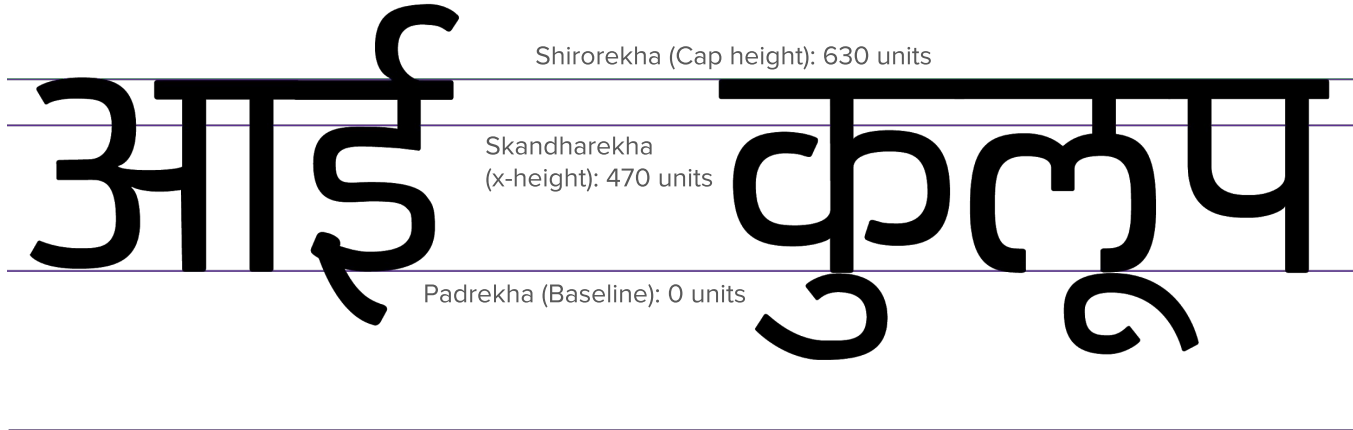
- Gokhale used the stroke thickness as a base unit
- Four strokes for upper matras
- Eight strokes for main character
- Four strokes for bottom matras
- A total of sixteen units of strokes can be considered as primary height of the letter



# Creation of Basic Grid

Urdhwarekha (Ascender): 1000 units

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Talrekha (Descender): -500 units

Horizontal Stroke (H): 64 units

Vertical Stroke (V): 76 units

V to H ratio: 1.1875

Diagonal Stroke: 65 units

# Creation of Samples

10 आई औषध कलंक अबोल ऋषी कूलुप

20 आई औषध कलंक अबोल ऋषी कूलुप

36 आई औषध कलंक अबोल ऋषी कूलुप

40 आई औषध कलंक अबोल ऋषी कूलुप

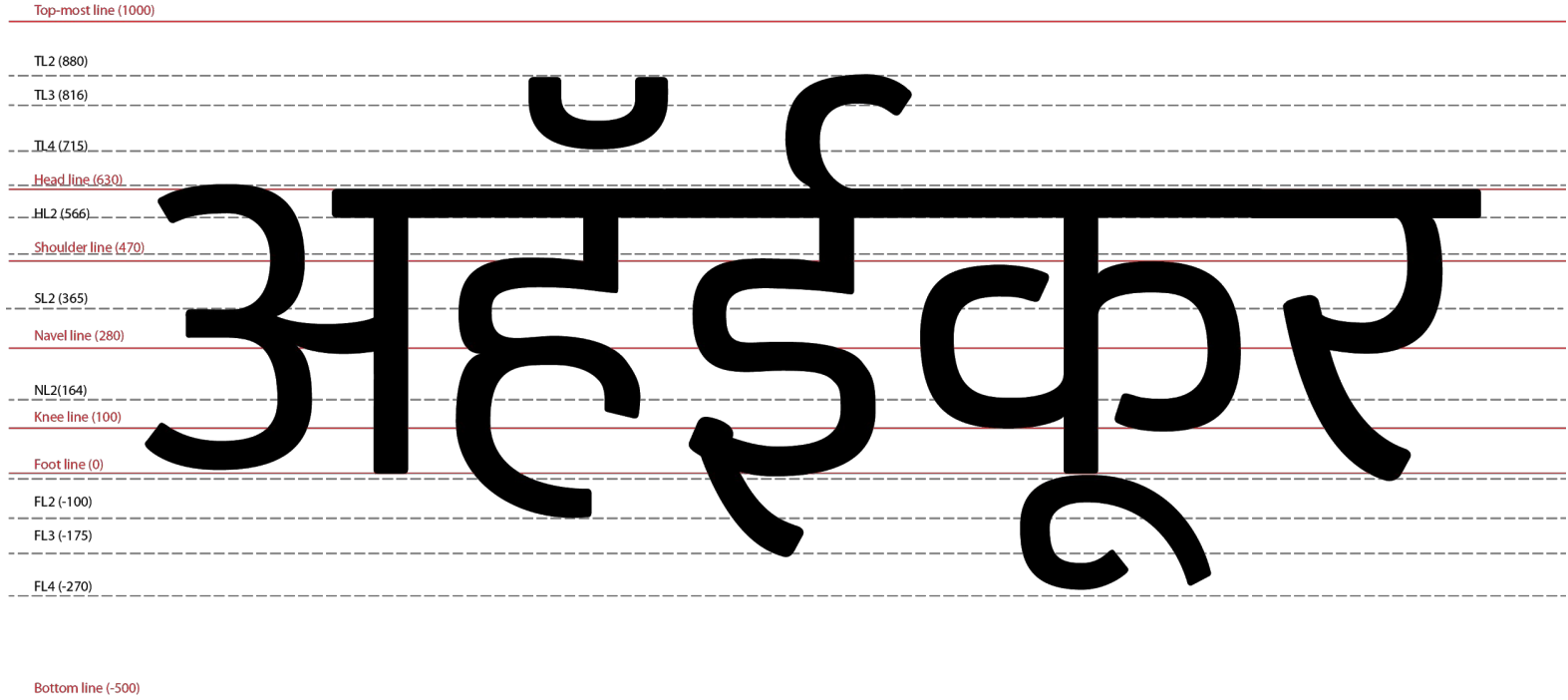
48 आई औषध कलंक अबोल ऋषी कूलुप

56 आई औषध कलंक अबोल ऋषी कूलुप

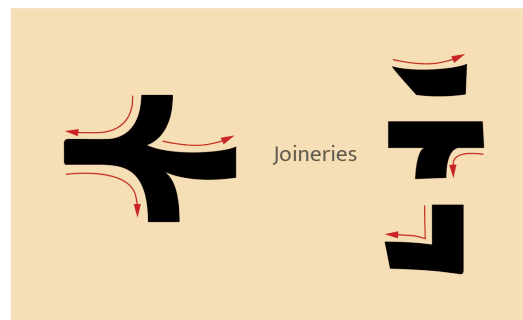
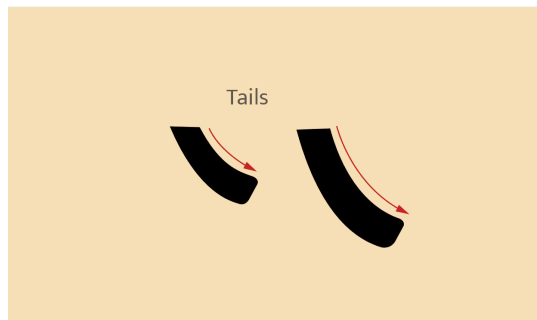
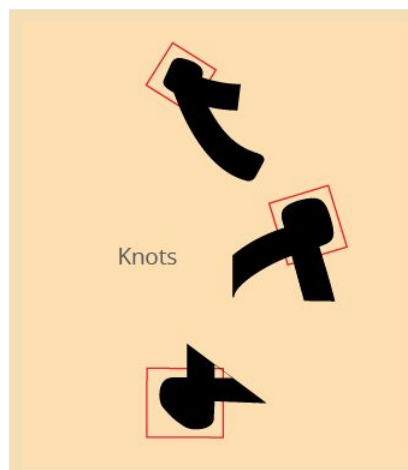
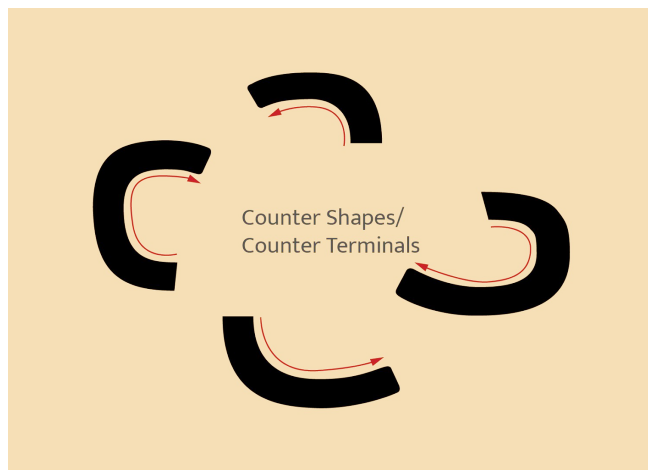
64 आई औषध कलंक अबोल ऋषी कूलुप

72 आई औषध कलंक अबोल ऋषी कूलुप

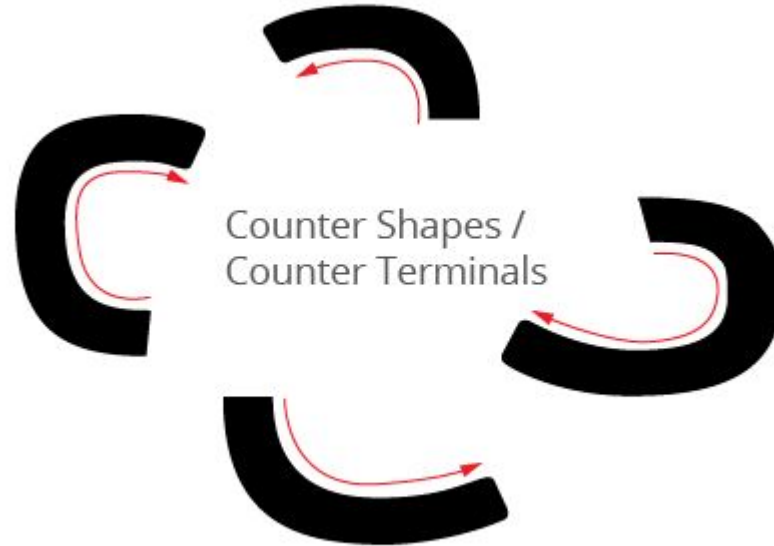
# Creation of Final Grid



# Identification of Primitives



# Identification of Primitives

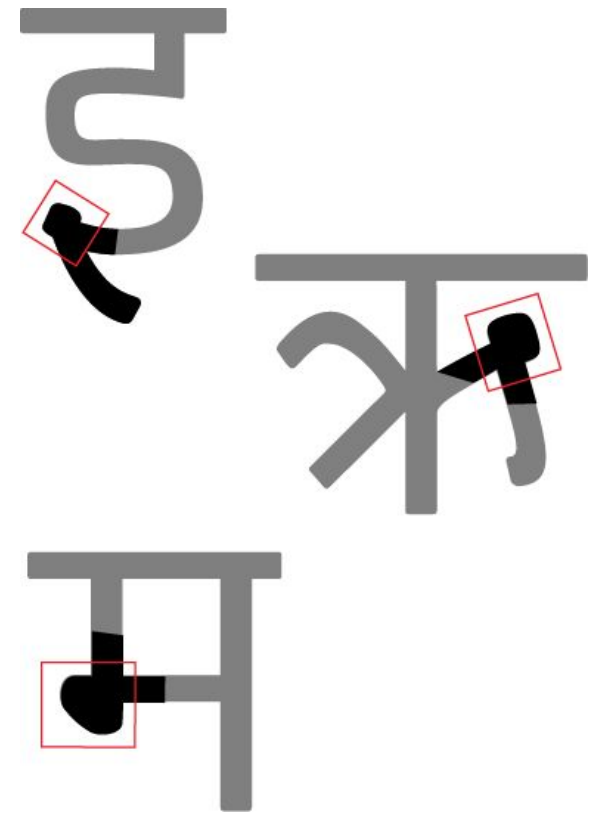
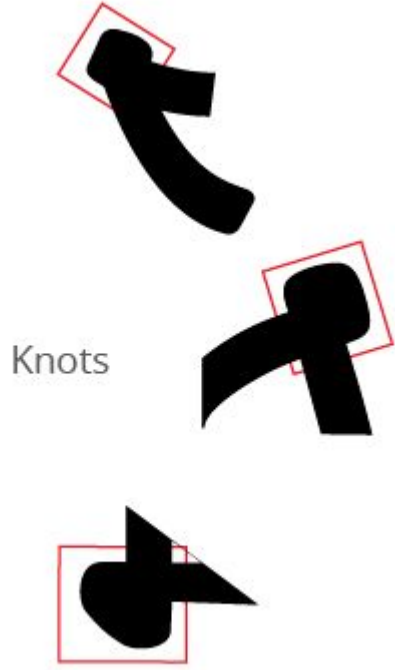




Counter Shapes /  
Counter Terminals

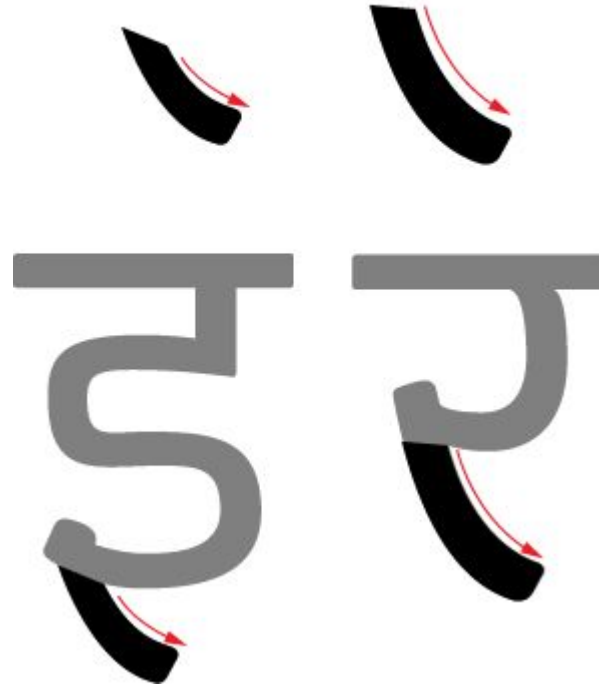


# Identification of Primitives



# Identification of Primitives

Tails



# Classification of Letters

Group 1 (11)		Group 2 (7)	Group 3 (4)	Group 4 (3)	Group 5 (3)
अ	ऑ	क	ट	ळ	ल
आ	उ	व	ठ	क्ष	लृ
ओ	ऊ	ब	ढ	त	लृ
औ		फ	द		
अं		प		Group 7 (4)	Group 8 (3)
अः		ष	Group 6 (3)	ग	य
आ		ण	र	म	थ
अँ			स	भ	ख
			श	न	

# Classification of Letters

Group 9 (7)	Group 10 (2)	Group 11 (2)	Group 12 (3)	Group 13 (3)
ड	ऋ	ए	घ	च
डः	ॠ	ऐ	छ	ज
झ			ध	ञ
झः				
झ्ञ				
ञ				
ण				

## Design/Redesign of Glyphs

अ → अ → अ

फ → फ → फ

# Constructing Conjuncts

- Segregation and Shortlisting of Conjuncts (Including Halant Forms)
- 318 to 151 to 125
- 11 Conjuncts Designed
- 114 Left
- Constructing samples using the Conjuncts

महाराष्ट्र

कअफवबडइईझज्ञआओषऔपए

अःआँअँछधघऐउअंऊऋलऋहस

थमरटष्ट्रड.तणठलृढदळक्षनभ

चजञयखशागप्रत्रस्थल्पघलृ

# Creating More Samples

FONTLAB FONT WATERFALL

Font: (null)

String: /Ma/matraEE/space\_/vowel\_E/Ka/matraA/space\_/Da/matra.E.2/Va/Na/matraA/Ga/Ra/matraEE/space\_/Tta/Anuswar/Ka/matraA/Cha/matraA/space\_/vowelA/matral/Bha/Ka/LPa/space\_/Ka/Ra/Ta/space\_/vowelAA/Ha/matra.E.2/Purnaviram  
Sizes: 10, 20, 30, 40, 50, 60, 70

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10. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

20. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

30. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

40. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

50. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

60. मी एका देवनागरी टंकाचा अभिकल्प करत आहे.

# Creating More Samples

FONTLAB FONT WATERFALL

Font: (null)

10/24/18 08:29:57

String: /Ma/U.kar/Li/matraA/KShha/Ra/matra.E.2/space\_/Ba/Na/Va/OO.kar/Na/space\_/Jha/matraA/La/matraEE/Ya/matra.E.2/Ta

Sizes: 10, 20, 30, 40, 50, 60, 70

Page 1/1

10. मुळाक्षरे बनवून झालीयेत

20. मुळाक्षरे बनवून झालीयेत

30. मुळाक्षरे बनवून झालीयेत

40. मुळाक्षरे बनवून झालीयेत

50. मुळाक्षरे बनवून झालीयेत

60. मुळाक्षरे बनवून झालीयेत

70. मुळाक्षरे बनवून झालीयेत

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# Glyphs Done So Far

- All 40 Consonants Complete
- All 18 Vowels Complete
- All 18 Corresponding Matras Complete
- 3 Out of 10 Punctuation Marks Done
- 10 Out of 125 Conjuncts Done
- Total 122 Glyphs Left

# Things to Do Next

- Completion of Rest of the Glyphs
- Further Creation of Samples
- Font Engineering for matra positioning
- OTF encoding for conjunct ligatures
- Suitable hinting for on–screen needs

# Conclusion

- Type Design is a Prolonged process which requires a lot of hard work, patience and attention to minutest details
- An Addition to the Group of Devanagari Fonts
- Creating more Weights and Making the Font Variable

धन्यवाद

Thank You