NAME:	Yashodeep Gholap
DESIGNATION:	Font Designer (Research Intern)
CO-AUTHORS:	Ted Harrison (President) Adam Twardoch (Product and Marketing Manager)
ORGANISATION:	Fontlab Ltd.
ADDRESS:	2B/29, Ramkrishna Nagar CHS, Near Sharanam Hotel, Eastern Express Highway, Thane(W)- 400604
EMAIL:	yashodeep.gholap@gmail.com
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Title of the paper: Towards a holistic Indic Font design software: Observations from the study of the Devanāgarī font design process.

Keywords: Indic type design | Software technology | Research in Type Design

Abstract: Indic typefaces particularly present a challenge for existing type design applications. In this paper, we present observations from the study of the Devanāgarī font design process. This study helped us to understand the functional needs of Indic type design from a software development perspective.

To analyze general practices, we approached a few Indic type designers from various age groups and backgrounds such as teachers, professionals, and students. After interviewing them, we tried to consolidate their process of designing typefaces, recorded the key stages in its development process, and the software difficulties faced by designers.

This research process mainly went through stages such as—determining key steps in the process of Devanāgarī type design, understanding aesthetic parameters in development process, observations about technological limitations of current applications. Through this study, we further anticipated the required functional, technical and user experience improvements in type design software to cope with the expectations of type designers.

Through our study we realized, the Indic type design process goes through various key stages. First, characters are sketched and explored in various shapes and sizes. After the character designs are finalized on paper, these drawings are digitized. Composite characters (such as Conjuncts) and vowel

marks (Mātrās) are developed from root letterforms to create the required glyph-set. Later, characters are properly spaced and kerned. Interpolation plays an important role in the development of multiple font weights. These weights go through open-type encoding to match the type-setting requirements. In order to make the fonts more legible on digital displays, fonts are hinted using either true-type or post-script hints. In the final stage, fonts are tested on various operating systems, devices, browsers, and applications for their visual quality and technical functionality.

The key factors that play an important role in development of Indic characters are—structural complexities of characters, stroke movements, shapes and axes of characters. Working on visual features such as knots, loops, overlapping strokes, shirorekhā (top line), vowel marks bring uniqueness in the typeface. Consideration of complexity of conjuncts as character wholes (akhanda); and language and design specific visual features is quite essential in the text type design.

In the production process, type designers face various technical challenges. While working with type design software, designers face difficulties such as setting appropriate horizontal metrics, deciding on the UPM size in multi-lingual fonts, glyph extensions, working with nodes between two masters (figure 1), glyph naming (figure 2), working with large kerning sets, OTF testing, etc. Identifying such flaws and problems in existing applications helped us review, what is lacking in current software solutions with respect to Indic type design process.

The observations revealed that current applications create a laborious and ineffective software environment. Type design applications lack in understanding the structural complexity of letterforms and functional requirements with better optimization for faster design development. The applications also fail to understand the linguistic requirements of a script, implementation of recent technological standards such as Unicode support and Indic open-type shaping engine for type testing (figure 3). These limitations make Indic type design process longer and more laborious.

On the basis of this analysis, we determined that software improvements should mostly be based on effective graphic user interface design and building strong functionalities for open-type development. We will present the detailed research findings and recommendations of the study.

The main objective of this study was to understand the functional and technological needs of Indic type design and hence develop a holistic solution for font design software. We aim to develop more robust, portable, user friendly, reliable and efficient software solutions for the Indic type design process through observations identified in the Devanāgarī font development process, understanding design operational needs of Indic type designers and by evaluating improvements required in current applications.

Figures:

Figure 1:   Technical error: The characters get distorted while interpolating the weights due to mismatch in number of node between two masters (font: Santipur OT)
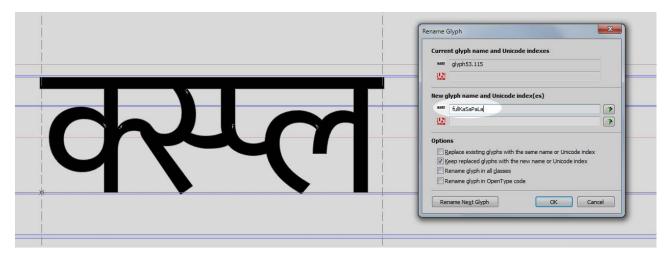

Figure 2:   Laborious task: Latin centric naming model creates a long string of characters in glyph naming; which increases the work load of type designers (font: Ek Devanagari)
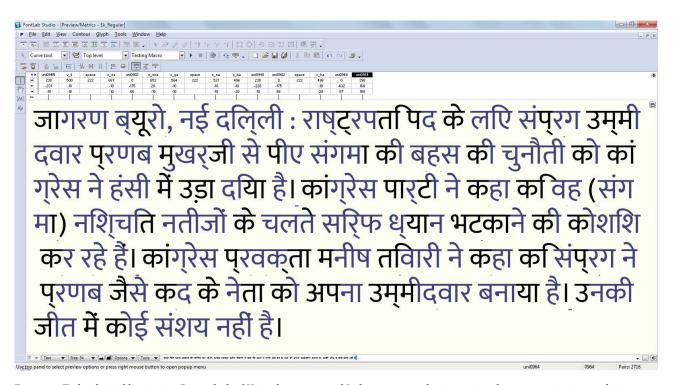

Figure 3:   Technological limitation: Due to lack of Unicode support and Indic open-type shaping engine for type testing in type design softwares; designers have to use an external program to test their typefaces during open-type development. (font: Ek Devanagari)

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