Conceptual Model for Devanagari Typefaces (2010)

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Research Abstract

Printing was introduced to the Indian subcontinent in the late sixteenth century. Ever since this time, the designing of Devanagari typefaces has largely been an intuitive activity, more often than not; primarily due to the fact that there exists no single, unanimously accepted body of work which formalizes the structure and display of Devanagari typefaces. This leads to show that the domain knowledge of Devanagari typography is complex, ambiguous, and non-standardized—hence inadequately interpreted. One can perceive a need here, for an academically validated theoretical model that describes the various aspects of Devanagari typefaces which presents a more informed view of Devanagari typography. Current type designers of Devanagari do follow certain tacit models while designing fonts, but none of these have been well documented nor have they been subjected to academic consolidation or validation. Th ere also have been attempts by designers and theorists to pen down some of their views on Devanagari lettering, calligraphy and type design, most of this work is however based on antiquated technologies and no authors have commented on contemporary typefaces and technologies.

An area that has been directly affected by the lack of a formal description is the classification of typefaces. Through our research we found the current classification systems for Devanagari to be inefficient. In order to understand how experts and non-experts view Devanagari typefaces, we captured and analysed classification strategies used by experts along with non-experts. Rigid classification systems when used in isolation or based upon a single parameter fail in identification and integration multiple points of view.

This research attempts to solve these problems by creating an explicit, formal ‘conceptual model’ that captures concepts and their relationships within this domain and theoretically represents this domain exhaustively. This model was also used in the

creation of a faceted classification system for Devanagari typefaces. Through our research we suggest, that a web-based faceted classification tool developed (implemented using HTML Flex, PHP and MySQL) based on the conceptual model allows for more accurate searching (in identity matching tasks) and better short listing (browsing) Devanagari fonts for general purpose use by experts as well as minimally informed users.

Organization of the thesis

The thesis is organized into six chapters including the introduction and conclusion. The introductory chapter is a partial anthypophora; where we introduce a set of questions related to typography, present the background to the field and narrow down the research questions, aims, and scope of the study. Following this, we detail the approach and the methodology used for the study.

Chapter two: Background study, presents an overview of the Devanagari script, its letters and its brief evolution over the ages, the number of characters, and signs are enumerated in detail. In the next part of this chapter details the historical development of the technology of printing. After this a survey on the anatomy of Devanagari fonts is presented where differences in the methods and nomenclature proposed by earlier authors to describe the anatomy of Devanagari letters are highlighted. The organization of existing Devanagari font catalogues is also presented so as to highlight their approaches and shortcomings.

Chapter three: Font Classifications Systems begins by with a discussion on the implications of font organization and font menu design. We then detail the procedure for an experiment that was performed to capture the various classification strategies of non-experts as well as experts. The main tool for research analysis—cluster analysis is discussed in relation to the experiment. Results of the experiments and its pertaining inferences (comparative differences between experts and non-experts) are also put down. An overview of the various classification systems used by the Latin and Arabic scripts, the historical classification systems both theoretical and practical (in use by type foundries) is then enumerated. This chapter concludes by detailing the limitations of rigid classification schemes.

Chapter four: Conceptual Model for Devanagari Typefaces first defines the notion of a conceptual model, and delineates the differences between and ontology and conceptual model. Methodology for building the model is then detailed out, with specific examples on the consolidation of concepts and terms from various sources. The emergent structures (properties of the facets/attributes) of the model are then defined. Finally the proposed model is presented which enumerates the underlying concepts, terms of Devanagari fonts and the relations that exist between them.

Chapter five: Faceted Font classification system, describes the translation from the created model to the schema for faceted classification. An overview of the system architecture is given along with the data model and the query language. We discuss the data entry mechanism and conflict resolution within this area. We present details (the implementation of the front end (graphical user interface) and usability factors affecting the same) of two prototypes that were developed and their evaluation; and conclude with the perceived advantages of this tool for searching typefaces and browsing fonts for selection.

Chapter six: Conclusion, in the final chapter we summarize our research work, and present the significant contributions of this study. We conclude by discussing future areas of research.