



**IDC** School of Design  
अभिकल्प विद्यालय

# Exploratory Prediction in Marathi

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Guide



# Declaration

I declare that this written submission represents my ideas in my own words and where others' opinions or words have been included, I have adequately cited and referenced the sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been appropriately cited or from whom proper permission has not been taken when needed.

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# Approval Sheet

This B.Des Design Project-I titled "Untitled" by Rhuturaj Mirashi, Roll Number 22B3613, is approved, in partial fulfilment of the B.Des Degree at the IDC School of Design, Indian Institute of Technology Bombay.

*Project Guide*

*Chairperson*

*External Examiner*

*Internal Examiner*



# Acknowledgement

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# oi Abstract

This project explores novel interaction mechanisms for text prediction in Marathi, specifically addressing the friction points caused by the language's agglutinative nature. This project investigates an alternative "Exploratory Prediction" interface that allows users to construct complex words using numbered shortcuts. The design aims to balance the trade-off between Ease of Automation and User Agency. Quantitative evaluation focused on metrics such as Words Per Minute (WPM) and Keystroke Savings.



## 02 Introduction

### 2.1 Background

Text entry is one of the most frequent interactions on mobile devices. While predictive text has matured for languages like English, Indian languages **specifically Marathi** presents a unique opportunity for design intervention due to **agglutination**, where words are formed by stringing together multiple morphemes (root + suffix + inflection).

### 2.2 Motivation

The project initially began as an exploration of voice input methods to reduce labor in typing. However, preliminary investigations revealed a critical friction point in Human-Computer Interaction (HCI): the trade-off between Ease of Typing and User Agency. Users often find aggressive autocompletion intrusive, yet manual typing is laborious. This project pivots to explore prediction input methods that restore agency to the user while maintaining speed.



# 02 Introduction

## 2.3 Problem Statement

Current predictive text input treat Marathi words as unique dictionary entries. This approach creates fundamental usability issues due to the language's structure:

1. The Prediction Shadow: As defined in previous IDC studies (Ghone, 2016), agglutinative variations (e.g., Ghara-chya-khali) are statistically less frequent than root words. Because predictive algorithms prioritize high-frequency root words, complex inflections fall into a "shadow" and are rarely displayed in the limited prediction bar, rendering the feature useless for long words.
2. The Corpus Complexity (Vocabulary Explosion): Unlike English, where a dictionary of 50,000 words covers the majority of daily usage, Marathi's agglutinative nature results in a theoretically infinite vocabulary. A single root can spawn hundreds of variations. Standard dictionary-based prediction models struggle to cover this massive corpus, leading to poor prediction accuracy for inflected words and forcing users to revert to manual typing for a significant portion of their input.





## 03 Research & Methodology

### 3.1 Methodology: Research through Design

Following the precedent of exploratory interaction design studies in this domain (Ghone, 2016), this project did not follow the classical linear design process of extensive user interviews followed by ideation. Instead, it adopted an iterative, "Research through Design" approach, the focus of this project was on hypothesizing and prototyping novel interaction mechanics. The primary research question was: **How can we redesign the selection mechanism to support word/sentence construction rather than just word completion?**



## 03 Research & Methodology

### 3.2 Research Objectives

- RO1 (Design): To explore and prototype novel interaction mechanisms that shift the paradigm from whole-word prediction to morpheme-based word construction.
- RO2 (Evaluate): To assess the efficacy of the proposed "Numbered Shortcut" mechanism against standard typing methods using quantitative metrics (WPM, KSPC).

### 3.3 Research Objectives

- RO1 (Design): To explore and prototype novel interaction mechanisms..
- RO2 (Evaluate): To assess the efficacy of the proposed prototype interaction mechanism against standard typing methods using quantitative metric of Keystrokes Per Character.