A. Administrative

1. Title: Proposal to Encode the Kaithi Script in Plane 1 of ISO/IEC 10646
2. Requester’s name: Anshuman Pandey (apandey@u.washington.edu)
3. Requester type (Member Body/Liaison/Individual contribution): Individual contribution
4. Submission date: October 25, 2005
5. Requester’s reference (if applicable): N/A
6. Choose one of the following:
   (a) This is a complete proposal: Yes
   (b) or, More information will be provided later: No

B. Technical - General

1. Choose one of the following:
   (a) This proposal is for a new script (set of characters): Yes
       i. Proposed name of script: Kaithi
   (b) The proposal is for addition of character(s) to an existing block: No
       i. Name of the existing block: N/A
2. Number of characters in proposal: 85
3. Proposed category: C - Major extinct
4. Proposed Level of implementation (1, 2 or 3): Level 2
   (a) Is a rationale provided for the choice?: Yes
       i. If Yes, reference: Indic (Brahmic) script with vowel signs
5. Is a repertoire including character names provided?: Yes
   (a) If Yes, are the names in accordance with the “character naming guidelines” in Annex L of P&P document?: Yes
   (b) Are the character shapes attached in a legible form suitable for review?: Yes
6. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?: Anshuman Pandey; True Type
   (a) If available now, identify source(s) for the font and indicate the tools used: Not yet available
7. References:
   (a) Are references (to other character sets, dictionaries, descriptive texts etc.) provided?: Yes
   (b) Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?: Yes
8. Special encoding issues:
   (a) Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? Yes; see text of the proposal.
9. Additional Information: Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see http://www.unicode.org/Public/UNIDATA/UCD.html and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

Character properties, numeric information, and currency information are included.
C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?: No
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? Yes
   (a) If Yes, with whom?: Scholars
      i. If Yes, available relevant documents: N/A
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Yes
   (a) Reference: Avadhi, Bhojpuri, Magahi, and Maithili speakers; as well as linguists, historians, legal scholars working with sources from the colonial South Asia.
4. The context of use for the proposed characters (type of use; common or rare): Common
   (a) Reference: Court records from colonial South Asia, didactic and pedagogical materials from north India, bibles printed in north India during the 19th and early 20th century. Also, please see the text of proposal for further information.
5. Are the proposed characters in current use by the user community?: Yes, by scholars working in fields enumerated above
   (a) If Yes, where? Reference: In India, the United States, and other localities.
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?: No
   (a) If Yes, is a rationale provided?: N/A
      i. If Yes, reference: N/A
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? Yes
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? No
   (a) If Yes, is a rationale for its inclusion provided?: N/A
      i. If Yes, reference: N/A
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? No
   (a) If Yes, is a rationale provided?: N/A
      i. If Yes, reference: N/A
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character? Yes
    (a) If Yes, is a rationale for its inclusion provided? Yes
        i. If Yes, reference: See text of proposal
11. Does the proposal include use of combining characters and/or use of composite sequences (see clauses 4.12 and 4.14 in ISO/IEC 10646-1: 2000)? Yes
    (a) If Yes, is a rationale for such use provided? Yes
        i. If Yes, reference: See text of proposal
    (b) Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? Yes
        i. If Yes, reference: See text of proposal
12. Does the proposal contain characters with any special properties such as control function or similar semantics? Yes
    (a) If Yes, describe in detail (include attachment if necessary): Virama
13. Does the proposal contain any Ideographic compatibility character(s)? No
    (a) If Yes, is the equivalent corresponding unified ideographic character(s) identified? N/A
        i. If Yes, reference: N/A
Proposal to Encode the Kaithi Script in Plane 1 of ISO/IEC 10646

Anshuman Pandey

October 25, 2005

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1 Proposal for the Kaithi Script

This is a proposal to encode the Kaithi script in the Supplementary Multilingual Plane (Plane 1) of the Universal Character Set (Unicode). The intention is to provide a standard method of writing Kaithi, as well as a means for the digital storage of Kaithi documents. A standard encoding for Kaithi is necessary for historians, linguists, and legal scholars working with Kaithi manuscripts and materials in the Avadhi, Bhojpuri, Magahi, and Maithili languages of north India.

The letters in this proposal comprise the core set of Kaithi letters. There are 85 characters in this proposal. Included in this set are fractions and a currency symbol. Symbols used for the notation of weights and measures have been excluded due to insufficient information. As additional details regarding the notation of weights and measures are identified, they will be submitted for formal review and inclusion within the Kaithi set. The letters in this proposal are sufficient for the encoding and processing of Kaithi documents.

The Kaithi script is identified in the Unicode Roadmap as part of the Supplementary Multilingual Plane (Plane 1) and is tentatively assigned to the range u+11600-1167f. This proposal will use the code-point values within the proposed range for reference to Kaithi letters.

The transliteration of Kaithi letters in this proposal follows the convention recommended in the ISO 15919 standard for the Transliteration of Devanagari and other Indic scripts into Roman.

The Kaithi typeface used throughout this proposal was drawn by the author of this proposal, Anshuman Pandey. The letters in the typeface are normalized forms of Kaithi letters as found in specimens printed with lead fonts as well as those that are penned by hand.

2 Overview of the Kaithi Script

The Kaithi script was widely used in north India, particularly in the former North-Western Provinces & Oudh (present-day Uttar Pradesh) and Bihar from at least the 18th century through the early 20th century. The name of the script is derived from the Sanskrit kāyastha, which is the name of the scribal caste in north India. Thus, kāyasthi, meaning “of the scribes”, or colloquially, kāyathi, or simply, kaithi.

Kaithi is a major historic script in which substantial collections of legal records, administrative accounts, census schedules, folk texts, pedagogical materials, and private letters were written and printed. Kaithi was recognized as a distinct script by the British colonial authority. In the 1880s, it was established as the official script of the law courts of Bihar. Kaithi was primarily a written script, but it entered the world of print for a brief period. The government of Bihar developed metal types for Kaithi for the printing of administrative records and for educational primers. Missionaries also developed Kaithi types for the printing of bibles.

Kaithi was the popular script of north India until well the second decade of the 20th century. The popularity of Kaithi placed it into competition with other scripts, such as Devanagari and Perso-Arabic. Its demise may be attributed to political conditions, in which Kaithi was replaced by Devanagari as the preferred script for official and literary production.

2.1 Languages Written in Kaithi

Kaithi was the traditional script for the Avadhi, Bhojpuri, and Magadhi languages, and was employed as the popular script for Maithili. At present these languages are written primarily in the Devanagari script, but “in earlier periods, varieties of Hindi were written in Kaithi and other regional scripts” (Shapiro 2003: 256).
Avadhi is spoken by 20 million people in regions of Bihar, Madhya Pradesh, Uttar Pradesh, and Nepal. Avadhi was traditionally written in the Kaithi script. However, Devanagari has been adopted for formal use and Kaithi is reserved predominantly for informal communication (Saxena 1937: 20).

Bhojpuri is spoken by 24.5 million people in Bihar, Madhya Pradesh, Uttar Pradesh in India. Speakers are also found in Nepal and Mauritius. The script traditionally used in writing Bhojpuri is Kaithi. There is significant publication activity in Bhojpuri. However, Devanagari is used for literary and formal publications, while Kaithi is restricted to informal communication. (M. Verma 2003: 519).

Magahi is spoken by 13 million people in in Bihar, Jharkhand, and West Bengal. Magahi is written typically in Kaithi and Devanagari. Kaithi, however, currently is used more for personal communications and in semi-legal transactions, whereas Devanagari is preferred for formal and literary media (S. Verma 2003: 501).

Maithili is spoken by 22 million people in Bihar and Nepal. It was recognized as an official language of India in 2004 and was added to Schedule VIII of the Constitution of India. Maithili is traditionally written in the Mithilākṣara, Kaithi, and Devanagari scripts. Brahmins used the Mithilākṣara (Maithili) script and non-Brahmins used Kaithi. Towards the turn of the twentieth century, Maithili began to be written in the Devanagari script (Yadav 2003: 484).

### 2.2 Styles of Kaithi

There are three identifiable styles of Kaithi: Bhojpuri, Maithili (Tirhuti), and Magahi (Magah). Grierson describes the Bhojpuri style as “the most legible;” the Maithili as “the most elegant;” and the Magah as “a mean between the two” (Grierson 1899: 4). Figure 7 compares the three regional forms of Kaithi. Excellent written specimens of these styles are provided in figure 24 (Maithili), 25 (Magahi), and Figure 26 (Bhojpuri).

The difference between the three styles may be ascribed primarily to swash attributes that are influenced by regional scribal traditions and in the variant forms of certain letters. Variant letters exist for $\acute{a}$, $\breve{s}$, $\grave{k}$a.
The inclusion of these variants in the standard is unnecessary. Separate fonts may be produced for the regional styles and the respective variants.

### 2.3 Classification of Kaithi for Unicode

Specialists of regional north Indian languages provide reason to believe that Kaithi is still used for informal communication. While Kaithi may still be used in Bihar and Uttar Pradesh, it is difficult to determine the nature of such use. While information about the present use of Kaithi is inconclusive, there is sufficient information to assert that Kaithi had significant written and print traditions and a high volume of production. Therefore, this proposal identifies Kaithi as a “Category C” (major extinct) script instead of a “Category A” (contemporary) or a “Category B.1” (specialized) script.

### 3 Relationship of Kaithi to Other Scripts

Kaithi is related to other major north Indian scripts and is the source from which other scripts have been derived. Kaithi is most closely related to Devanagari and bears similarities to Gujarati, most notably in the shared absence of the head-line, as is already noted in *The Unicode Standard, 4.1.0* (The Unicode Consortium 2003: 236).

Kaithi is often considered a corruption or cursive form of Devanagari, however, the relationship is more appropriately characterized as one of parallel development rather than linear descent. Grierson stated that while Kaithi and Devanagari are related, Kaithi is not descended from Devanagari. Rather, “the two alphabets arose pari passu, from an older original still found existing in inscriptions and the like” (Grierson 1899: 3). The emergence of Kaithi and Devanagari from a common source explains the similarity between the scripts in terms of certain letter shapes, but the differences between the two scripts also highlights divergences in their development. The similarities between Kaithi owe more to reciprocal influences than to unidirectional influence.

Kaithi is derived from Brāhmī and falls, geographically, into the eastern group of scripts used for the New Indo-Aryan languages, which include Kaithi, Bangla, Oriya, Maithili, and other scripts of Bihar (Salomon 2003: 69). Chatterji confirms this assessment, writing that,

> “the old Dēva-nāgārī style of the Indian alphabet which prevailed in Northern and Western India [which is the Gupta or ‘Proto-Nāgārī’ script] from the 7th century, namely, the «Kaithī» script, came to Magadha by way of the Bhōjpuriyā tract; and this Kaithī alphabet has held the ground till now. Kaithī because of its simplicity has spread to Mithilā as well, where only the Brāhmans and other upper classes keep up the old Maithili character (Chatterji 1926: 225).

Regarding the relationship of Kaithi to Devanagari, Rudolph Hoernle wrote that

> Though it has a general resemblance to the modern Devanāgarī, there are but few of its letters, which do not exhibit some points of difference; indeed, as will be seen by a reference to the table, all the vowels, and the consonants kh, ch, jh, bh, d, dh and r differ entirely in the two alphabets; and the horizontal top-line is omitted by the Kaithi in all letters alike. (Hoernle 1975: 1).

He continues, adding that

> Four principal types of alphabet are used in North-India; the Kaithī, the Bangālī, the Oriā and the Gur-mukhī. The Kaithi is the most widely spread; it is used in writing not only in Eastern, but also, slightly modified, in Western Hindūstān, Marāṭhā and Gujarāt. In G. [Gujarati] and E.H. [Eastern Hindi] it is adopted also in print. [T]here are two sub-types much in use in the area occupied by the Kaithi, to which they are the most nearly related. There are the Nāgarī or Devanāgarī and the Mahājanī or Koṭhīvāl. (Hoernle 1975: 2).
Figure 2: Kaithi type as shown in an excerpt from a Bhojpuri specimen in the Linguistic Survey of India (Grierson 1903: 223).

Samuel Kellogg writes that “besides the Devanágari, Hindí is written in three other alphabets, the Káyathí, the Mahájání or Sarráfi, and the Baniautí (Kellogg 1893: 23). He states further that “both the Mahájání and the Baniautí are derived directly from the Káyathí. (Kellogg 1893: 23).

The Kaithi script is also related to the Syloti Nagri (Sylheti Nagari) script, which was recently encoded in Unicode. James Lloyd-Williams, the author of the Syloti Nagri proposal, states that Syloti Nagari is most closely related to the Magahi style of Kaithi, however the behavior of the Syloti Nagri script, as well as distinct letterforms and orthographic devices, justify its status as a distinct script, separate from Kaithi (Lloyd-Williams, et al. 2003: 6).

Figure 5.7 provides a comparison between the consonants and independent vowels of Kaithi, Gujarati, and Devanagari. The comparison indicates that while Kaithi and Gujarati have certain letterforms in common, there are letters which are unique to Kaithi.

4 Usage and Status of Kaithi

The popular status of Kaithi in north India resulted in the creation of large numbers of documents in the script. Large numbers of documents in Kaithi are extant. These documents are typically court reports completed in hand. Also, bibles, particularly the gospels, were printed in Kaithi by bible societies operating in colonial India.

The first font of Kaithi type was created by J.C. Nesfield, the Director of Public Instruction for Oudh, in 1875. Nesfield assembled samples of Kaithi writing from all of the districts of Oudh and devised a standard form of Kaithi. Nesfield’s font led to instruction in the Kaithi script in the vernacular schools of Oudh.

By 1881, textbooks in the standardized Kaithi script appeared in primary and middle vernacular schools and were initiated for the use in scribal examinations (King 1994: 65-66). Data on the number of primers and textbooks available in Kaithi is limited. Official records, such as the Report on Indigenous Education and Vernacular Schools, provide some statistics on the use of Kaithi in education. An edition of this report from 1854 shows that 77,368 primers were printed in the “Káyasthí alphabet”, while 25,151 were printed in the “Nágári alphabet” in the North-Western Provinces & Oudh (Vedalankar 1969: 154). Schools in which the Kaithi script was the medium “outnumbered those in which the Nágári character was in use.” But the prevalence of Kaithi “in all but a few districts” of the North-western Provinces & Oudh probably motivated government officials “to introduce Nágári instead of the Kaithi character in ‘Káyasthí’ Schools,” in which the vernacular language was the medium of instruction, not formal Hindi. (Vedalankar 1969: 152).

In 1880, Kaithi was established as the official script of the Bengal Government (Grierson 1899: 1). The
significance of this act is apparent from the dedication in Sir G.A. Grierson’s *Handbook to the Kaithi Character*:

To the Honorable Sir Ashley Eden, K.C.S.I., Lieutenant-Governor of Bengal, who, by first introducing Kaithi as the sole official character of our law courts, has done more for Bihar than a decade of legislation.

Sir Ashley Eden ordered the exclusive use of Kaithi or Devanagari in Bihar, which was at that time still a region of the Bengal administration. Christopher King writes that “the government intended the Nagari and Kaithi scripts to take the place of the Persian script in printed and hand-written documents respectively” (King 1994: 67). After conferring official status upon Kaithi, the government initiated the creation of a font of Kaithi type, which was based on the improved and standardized Kaithi created in Oudh by Nesfield. By 1881, the standardized Kaithi “had been prescribed for general use in the primary vernacular schools of Bihar, and had begun to appear in printed textbooks” (King 1994: 68), generally for primers for elementary school classes (Ojhā 1971 [1918]: 130). The schools and courts of Bihar continued to use the script until at least 1913 (King 1989: 192).

Kaithi was also used extensively in the Bengal Presidency for administrative activities, such as census operations. Henry Beverly, the Inspector General of Registration in Bengal, enumerated Kaithi as one of the scripts in which census schedules and forms were printed:

> The various forms required for the census were, with some few exceptions, printed at the larger Government Press ... near Calcutta. These forms had to be translated into several languages to suit the different nationalities to be found in Bengal. Thus, a Bengali translation was required for Bengal Proper; Hindustani in both the Persian and Kaithi character for Behar; Oorya for Orissa; Hindee in the Nagri character for Chota Nagpore and the Sonthal Pergunnahs, and Nepalese for some parts of Darjeeling (Beverly 1874: 76).

Finally, missionaries and bible societies turned to the Kaithi script in order to print bibles because it was the script that was most commonly read in north India (see figure 27). The Kaithi script was even taught in universities in the United States, most notably at the Department of Comparative Religion at the University of Chicago, where would-be missionaries to India were required to take a course in Hindi which consisted of

> [...] a careful study of the grammar of the Hindî language, both literary and provincial; the ordinary rules of syntax; exercises in Hindi composition and conversation; the writing of the language in the native character (both Nâgarî and Kaithî); [...] (“Comparative Religion Notes” 1894: 293).

Grierson, who carried out extensive research on Kaithi, included both printed and hand-written specimens of the script in his *Linguistic Survey of India*. However, Grierson gave no indication of the origin of the fonts he used to typeset the specimens of Bhojpuri, Magahi, and Maithili in the Kaithi script, and it is unclear if the types in the *Linguistic Survey of India* were based on those commissioned by Nesfield or Eden, or were in fact a new set produced by Grierson.

In his grammar, Kellogg wrote that books are printed in Kaithi, “but it is by no means as common as the Devanāgari” (Kellogg 1893: 23). Hoernle supports Kellogg’s claim, stating that Kaithi “is used in printing as well as in writing; but owing to the preponderance of H. H. [High Hindi], which has adopted the Devanāgari, the latter is much more common in books” (Hoernle 1975: 2). He continues, stating that Devanagari “will probably in course of time entirely supersede the Kaithî; perhaps not altogether an advantage, as it can be written with less rapidity and ease than its rival (Hoernle 1975: 2).

Hoernle’s forecast was certainly accurate. In the mid 20th century, Devanagari began to replace Kaithi as the standard script for Hindi and its ‘dialects’. Organizations like the Nagari Pracharini Sabha (Society for the Promotion of Nagari) were influential in the spread and popularity of Devanagari. However, the linkage of Hindi exclusively with Devanagari “is a phenomenon that owes its origins primarily to the politics and sentiments of the past century” (Shapiro 2003: 257). There appears to have been a systematic program to
replace Kaithi with Devanagari, and a parallel plan of emphasizing the use of standardized Hindi.

The fundamental distinction between Kaithi and Devanagari lies in the sphere of use. Kaithi was used for official government purposes, but was relegated to informal public spheres by Devanagari. Therefore, “Devanagari is the script for whatever is sought to be published today, or has been sought to be published since the early part of the twentieth century. Part of the reason may be simply the unavailability of typesetting for Kaithi. But more importantly, Devanagari in the greater Hindi area has a more scholarly image and is perceived as the right instrument for any kind of activity that has any claim to being literary. Devanagari as the ‘metropolitan script’ script (as the name implied) has increasingly become the script of the new literatures of Bihari and other ‘regional’ languages and also replaced the earlier scripts” (S. Verma 2003: 501).

The Kaithi script, although marginalized now due to the prominence of Devanagari, was widely used throughout north India. Its status as the official script of the British administrations in the North-Western Provinces & Oudh and Bihar is evidence of its utility and use. Furthermore, its selection for the medium of written instruction in the schools of both provinces speaks to its use among a wide segment of north Indian society. Lastly, there is a vast number of documents written in the Kaithi script, as well as those documents and books printed in it.

The use of Kaithi as a distinct script for administrative and educational purposes in Bihar, and possessing printing tradition, is certainly clear.

The history and use of Kaithi justifies and necessitates the need for an independent encoding of the Kaithi script in the Universal Character Set. As a major script that was used alongside other major scripts like Devanagari and Perso-Arabic, users working with Kaithi documents require the ability to distinguish between these scripts on the basis of code-points not merely font selection or unification.

5 The Kaithi Script

The letters of the Kaithi script shown in this proposal are normalized forms of those found in specimens of both printed Kaithi and written manuscripts.

Kaithi is written from left to right. There are 33 consonant letters and 10 vowel letters, including 9 vowel signs (there is no sign for Kaithi letter a). Syllabic formation follows the model typical to most Brāhmi scripts. Consonant letters bear the inherent vowel a when unaccompanied by a vowel sign. Vowel signs are placed to the right of the consonant to which they are applied, with the exception of KAITHI VOWEL SIGN 1, which is applied to the left of the consonant.

5.1 Collating Order

The collating order for Kaithi follows that of Devanagari, with one distinction. Kaithi does not possess unique letters for velar and palatal nasals. Moreover, the dental nasal (\(\text{antiago}\)) is commonly used as a generic nasal marker for all articulation classes. In such cases, the dental nasal should be sorted as a member of the class to which the second member of the conjunct belongs. For example, in the conjunct \(\text{s\(\text{antiago}\)}\) \(-\text{nt-}\) the dental nasal letter represents a dental nasal sound. However, in the conjunct \(\text{s\(\text{antiago}\)}\) \(-\text{ndl-}\) \(-\text{ndl-}\) the dental nasal represents a retroflex nasal because the following consonant is a retroflex stop. See section 5.2 for further details.
CONSONANTS

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<td>KAITHI LETTER II</td>
</tr>
<tr>
<td>u</td>
<td>KAITHI LETTER U</td>
</tr>
<tr>
<td>ù</td>
<td>KAITHI LETTER UU</td>
</tr>
<tr>
<td>e</td>
<td>KAITHI LETTER U</td>
</tr>
<tr>
<td>ñ</td>
<td>KAITHI LETTER AI</td>
</tr>
<tr>
<td>o</td>
<td>KAITHI LETTER O</td>
</tr>
<tr>
<td>au</td>
<td>KAITHI LETTER AU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aa</th>
<th>Kaithi Letter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ñ</td>
<td>KAITHI VOWEL SIGN AA</td>
</tr>
<tr>
<td>i</td>
<td>KAITHI VOWEL SIGN I</td>
</tr>
<tr>
<td>ì</td>
<td>KAITHI VOWEL SIGN II</td>
</tr>
<tr>
<td>u</td>
<td>KAITHI VOWEL SIGN U</td>
</tr>
<tr>
<td>ù</td>
<td>KAITHI VOWEL SIGN UU</td>
</tr>
<tr>
<td>e</td>
<td>KAITHI VOWEL SIGN E</td>
</tr>
<tr>
<td>ñ</td>
<td>KAITHI VOWEL SIGN AI</td>
</tr>
<tr>
<td>o</td>
<td>KAITHI VOWEL SIGN O</td>
</tr>
<tr>
<td>au</td>
<td>KAITHI VOWEL SIGN AU</td>
</tr>
</tbody>
</table>

Figure 3: Consonant and vowel letters of the Kaithi script.
5.2 Consonant conjuncts

Consonant conjuncts are rare in Kaithi. Avadhi, Bhojpuri, Magahi, and Maithili have a tendency to simplify consonant clusters by metathesis. These processes are reflected in Kaithi orthography. In instances where vowel insertion does not occur, conjuncts are broken with virāma.

The most common simplification of consonant clusters is the introduction of an epenthetical vowel: Sanskrit karma (Dev. कर्म) becomes Bhojpuri karam (Kai. करम); pradeśa प्रदेश becomes pardes पार्देस. In other cases, anaptyxis is used: Sanskrit śāma (Dev. शाम) becomes Bhojpuri asāma अशाम.

Clusters involving glides are modified by changing the glide to its corresponding vocalic counterpart: Sanskrit vyavahāra (Dev. व्यवहार) becomes Bhojpuri beohār (Kai. बोहार); Sanskrit jñāna ज्ञान is simplified to gīn गीन.

In print there appears to be a tendency to use virāma to break conjuncts. It is unknown whether this was a reflection of actual practice or a limitation in the available types. The following examples show the use of virāma to break conjuncts.

Also, note the use of na न for conjuncts involving both dental and retroflex consonants.

• वैकुण्ठ > vaikunth
• थांड > थांढाः
• ग्हांठ > ग्हांठ
• किन्तु

Some Kaithi documents show 'false' conjuncts with the second consonant of the cluster is ra. In the example below, the word pargana is written pragana:

There is great irregularity and inconsistency regarding the use of conjuncts. The example below is a good example, where a ligature is used to write the conjunct mpu, but not rna in the word sampūrna:

Irregular conjunct formation in printed Kaithi is highlighted by the half-form of sa स as the first member of a conjunct

In writing, doubled consonants are written only once (Kellogg 1893: 23). A word like patta पत्ता is written pata पता. In print, however, virāma may be used to indicate gemination:

The use of virāma in printed Kaithi, as opposed to using a single character, may arise from the intention to represent phonological accuracy in published documents.
5.3 Digits

Kaithi uses a decimal system, similar to Devanagari:

\[
\begin{align*}
0 & \quad \text{KAITHI DIGIT ZERO} \\
1 & \quad \text{KAITHI DIGIT ONE} \\
2 & \quad \text{KAITHI DIGIT TWO} \\
3 & \quad \text{KAITHI DIGIT THREE} \\
4 & \quad \text{KAITHI DIGIT FOUR} \\
5 & \quad \text{KAITHI DIGIT FIVE} \\
6 & \quad \text{KAITHI DIGIT SIX} \\
7 & \quad \text{KAITHI DIGIT SEVEN} \\
8 & \quad \text{KAITHI DIGIT EIGHT} \\
9 & \quad \text{KAITHI DIGIT NINE}
\end{align*}
\]

5.4 Punctuation

Punctuation is not consistent in Kaithi. Grierson writes that “Kaithi has no stops except the full period” and “it is not customary to leave any space between the words,” but the “Standard Kaithi, however, used in Government offices, does separate its words” (Grierson 1899: 4). However, various forms of punctuation are used to mark word and line endings, abbreviations, and hyphenation. The following signs are included in the proposal and are discussed below:

<table>
<thead>
<tr>
<th>\quad KAITHI DANDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>\quad KAITHI DOUBLE DANDA</td>
</tr>
<tr>
<td>\quad KAITHI ABBREVIATION SIGN</td>
</tr>
<tr>
<td>\quad KAITHI WORD SEPARATOR</td>
</tr>
<tr>
<td>\quad KAITHI SENTENCE SEPARATOR</td>
</tr>
</tbody>
</table>

5.4.1 Danda

As with other scripts derived from Brāhmī, Kaithi uses the \textit{danḍā} and double \textit{danḍā} to indicate line endings. The shape and function of the Kaithi \textit{danḍā} and double \textit{danḍā} is similar to those of Devanagari, and are therefore to be unified with the latter. Figure 18 provides an example of the use of \textit{danḍā} and double \textit{danḍā} in printed texts.

5.4.2 Hyphenation

Hyphenation at line boundaries is rare in written Kaithi, but does appear in printed documents. Proper hyphenation would occur within words at syllabic boundaries. The example below shows a hyphen occurring at a line boundary and splitting the word कॉले́सिय़े के
A surprising example of hyphenation occurs in the example below. Here hyphenation splits a conjunct formed with virāma in the word barāmhan बरामहन. This example also illustrates metathesis in the consonant conjunct hma, which is rendered mha.

5.4.3 Abbreviation

An abbreviation sign ᱟ is commonly found in Kaithi documents. It is similar in function to the corresponding sign (U+0970) in Devanagari. The Kaithi abbreviation sign may resemble the digit zero in rapid writing, however, the two are contextually distinguishable. In hand-written Kaithi documents, this sign is used to abbreviate commonly used words, primarily at the beginning of documents. In the following example, the abbreviation sign follows the letter la:

cré is an abbreviation for likhitam लिखितम, meaning “it is written,” and abbreviated due to its common use as an introductory statement in written statements submitted to the courts.

5.4.4 Word and Sentence Separators

As in many scribal traditions, there is a tendency in Kaithi to write without marking word boundaries through the use of spaces. In other cases, punctuation may be introduced to identify boundaries between words and sentences. In printed Kaithi, word boundaries are generally marked by spaces and phrases are separated using the ḍaḷā or double ḍaḷā. The example below shows the use of – to mark word boundaries and the use of + to mark line boundaries.

The specimen in figure 23 on page 30 also shows the use of word separators in written Kaithi.

5.5 Fractions

Kaithi has notations for a fractional system that was in common use throughout north India. This system is a base-16 (hexadecimal) system. The fractions are notated as follows:

- KAITHI FRACTION ONE SIXTEENTH
- KAITHI FRACTION ONE EIGHTH
- KAITHI FRACTION THREE SIXTEENTHS
- KAITHI FRACTION ONE FOURTH
- KAITHI FRACTION FIVE SIXTEENTHS
- KAITHI FRACTION SIX SIXTEENTHS
- KAITHI FRACTION SEVEN SIXTEENTHS
- KAITHI FRACTION ONE HALF
- KAITHI FRACTION NINE SIXTEENTHS
- KAITHI FRACTION FIVE EIGHTHS
- KAITHI FRACTION ELEVEN SIXTEENTHS
- KAITHI FRACTION THREE FOURTHS
- KAITHI FRACTION THIRTEEN SIXTEENTHS
- KAITHI FRACTION SEVEN EIGHTHS
- KAITHI FRACTION FIFTEEN SIXTEENTHS
- KAITHI DIGIT ONE

This system was used to notate currency, weights, and other measures. See section 5.6 for specific usage for currency notation.
5.6 Currency

North Indian currency systems are traditionally based on the unit of the *rupāya*, or “rupee”. The rupee was historically divided into a unit of sixteen parts called the *ānā* (see figure 4). Currency notations occur frequently in Kaithi legal manuscripts.

The text in the circled portion of the excerpt below is *five rupee*, where the currency is notated as /BH/GN.

The text in the circled portion of the excerpt below is *one-hundred rupee*, where the currency is notated as /BH/GN.

5.7 Head-line

Several Kaithi documents show Kaithi written with what appears to be a head-line, similar to that of Devanagari. The line is not a head-line, but a typographic device used for emphasis, titling, or sectioning. Grierson notes that “in many documents it is customary to rule only the first line, for show; and to leave the rest unruled, for comfort” (Grierson 1899: 4). Hoernle adds that

Sometimes a series of lines is first ruled across the page, and the letters are afterwards hung on to them.
These lines must not be confounded with the top-line of the Devanāgarī, and in native writing the two are easy to distinguish (Hoernle 1975: 1f).

The following example shows the use of ruled lines for written Kaithi:
<table>
<thead>
<tr>
<th>KAI</th>
<th>GUJ</th>
<th>DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ka</td>
<td>ක</td>
<td>क</td>
</tr>
<tr>
<td>kha</td>
<td>ປ</td>
<td>ख</td>
</tr>
<tr>
<td>ga</td>
<td>ຜ</td>
<td>ग</td>
</tr>
<tr>
<td>gha</td>
<td>ຘ</td>
<td>घ</td>
</tr>
<tr>
<td>ña</td>
<td>ທ</td>
<td>ङ</td>
</tr>
<tr>
<td>ca</td>
<td>ຕ</td>
<td>च</td>
</tr>
<tr>
<td>cha</td>
<td>ປ</td>
<td>छ</td>
</tr>
<tr>
<td>ja</td>
<td>ຟ</td>
<td>ज</td>
</tr>
<tr>
<td>jha</td>
<td>ຟ</td>
<td>झ</td>
</tr>
<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
</tr>
<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
</tr>
<tr>
<td>ta</td>
<td>ມ</td>
<td>ट</td>
</tr>
<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
</tr>
<tr>
<td>da</td>
<td>ຣ</td>
<td>ठ</td>
</tr>
<tr>
<td>ra</td>
<td>ຢ</td>
<td>ड</td>
</tr>
<tr>
<td>dha</td>
<td>຤</td>
<td>ढ</td>
</tr>
<tr>
<td>rha</td>
<td>ລ</td>
<td>ण</td>
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<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
</tr>
<tr>
<td>da</td>
<td>ຣ</td>
<td>ठ</td>
</tr>
<tr>
<td>dha</td>
<td>຤</td>
<td>ढ</td>
</tr>
<tr>
<td>na</td>
<td>ລ</td>
<td>ण</td>
</tr>
<tr>
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<td>ສ</td>
<td>प</td>
</tr>
<tr>
<td>pha</td>
<td>ສ</td>
<td>प</td>
</tr>
<tr>
<td>ba</td>
<td>ບ</td>
<td>ब</td>
</tr>
<tr>
<td>bha</td>
<td>ບ</td>
<td>भ</td>
</tr>
<tr>
<td>ma</td>
<td>ຜ</td>
<td>म</td>
</tr>
<tr>
<td>ya</td>
<td>ນ</td>
<td>य</td>
</tr>
<tr>
<td>ra</td>
<td>ຍ</td>
<td>र</td>
</tr>
<tr>
<td>la</td>
<td>ຖ</td>
<td>ल</td>
</tr>
<tr>
<td>va</td>
<td>ດ</td>
<td>व</td>
</tr>
<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
</tr>
<tr>
<td>ña</td>
<td>ຟ</td>
<td>ङ</td>
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<td>sa</td>
<td>ຘ</td>
<td>स</td>
</tr>
<tr>
<td>ha</td>
<td>ຢ</td>
<td>ह</td>
</tr>
</tbody>
</table>

Figure 5: A comparison of the Kaithi, Gujarati, and Devanagari scripts
6 Glyph Chart
7 Character Names and Properties

11602; KAITHI SIGN ANUSVARA; Mn; 0; NSM; ; ; ; ; ; N; ; ; ; ; ;
11603; KAITHI SIGN VISARGA; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11605; KAITHI LETTER A; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11606; KAITHI LETTER AA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11607; KAITHI LETTER I; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11608; KAITHI LETTER II; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11609; KAITHI LETTER U; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1160A; KAITHI LETTER UU; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1160F; KAITHI LETTER E; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11610; KAITHI LETTER AI; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11613; KAITHI LETTER O; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11614; KAITHI LETTER AU; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11615; KAITHI LETTER KA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11616; KAITHI LETTER KHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11617; KAITHI LETTER GA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11618; KAITHI LETTER GHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1161A; KAITHI LETTER CA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1161B; KAITHI LETTER CHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1161C; KAITHI LETTER JA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1161D; KAITHI LETTER JHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1161F; KAITHI LETTER TTA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11620; KAITHI LETTER TTHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11621; KAITHI LETTER DDA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11622; KAITHI LETTER DDHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11623; KAITHI LETTER NNA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11624; KAITHI LETTER TA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11625; KAITHI LETTER THA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11626; KAITHI LETTER DA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11627; KAITHI LETTER DHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11628; KAITHI LETTER NA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162A; KAITHI LETTER PA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162B; KAITHI LETTER PHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162C; KAITHI LETTER BA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162D; KAITHI LETTER BHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162E; KAITHI LETTER MA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1162F; KAITHI LETTER YA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11630; KAITHI LETTER RA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11632; KAITHI LETTER LA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11635; KAITHI LETTER VA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11636; KAITHI LETTER SHA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11637; KAITHI LETTER SSA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11638; KAITHI LETTER SA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11639; KAITHI LETTER HA; Lo; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1163E; KAITHI VOWEL SIGN AA; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1163F; KAITHI VOWEL SIGN I; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11640; KAITHI VOWEL SIGN II; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
11641; KAITHI VOWEL SIGN U; Mn; 0; NSM; ; ; ; ; ; N; ; ; ; ; ;
11642; KAITHI VOWEL SIGN UU; Mn; 0; NSM; ; ; ; ; ; N; ; ; ; ; ;
11647; KAITHI VOWEL SIGN E; Mn; 0; NSM; ; ; ; ; ; N; ; ; ; ; ;
11648; KAITHI VOWEL SIGN AI; Mn; 0; NSM; ; ; ; ; ; N; ; ; ; ; ;
1164B; KAITHI VOWEL SIGN O; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1164C; KAITHI VOWEL SIGN AU; Mc; 0; L; ; ; ; ; ; N; ; ; ; ; ;
1164D; KAITHI SIGN VIRAMA; Mn; 9; NSM; ; ; ; ; ; N; ; ; ; ; ;
11651; KAITHI CURRENCY SIGN RUPAYA; Sc; 0; ET; ; ; ; ; ; N; ; ; ; ; ;
Proposal to Encode the Kaithi Script in Plane 1 of ISO/IEC 10646

Anshuman Pandey

1165C;KAITHI LETTER DDDHA;Lo;0;L;11621 1163C;;;;N;;;;;
1165D;KAITHI LETTER RHA;Lo;0;L;11622 1163C;;;;N;;;;;
1165E;KAITHI LETTER YYA;Lo;0;L;1162F 1163C;;;;N;;;;;
11660;KAITHI WORD SEPARATOR;Po;0;L;;;;;N;;;;;
11661;KAITHI SENTENCE SEPARATOR;Po;0;L;;;;;N;;;;;
11664;KAITHI DANDA;Po;0;L;;;;;N;;;;;
11665;KAITHI DOUBLE DANDA;Po;0;L;;;;;N;;;;;
11666;KAITHI DIGIT ZERO;Nd;0;L;;0;0;0;N;;;;;
11667;KAITHI DIGIT ONE;Nd;0;L;;1;1;1;N;;;;;
11668;KAITHI DIGIT TWO;Nd;0;L;;2;2;2;N;;;;;
11669;KAITHI DIGIT THREE;Nd;0;L;;3;3;3;N;;;;;
1166A;KAITHI DIGIT FOUR;Nd;0;L;;4;4;4;N;;;;;
1166B;KAITHI DIGIT FIVE;Nd;0;L;;5;5;5;N;;;;;
1166C;KAITHI DIGIT SIX;Nd;0;L;;6;6;6;N;;;;;
1166D;KAITHI DIGIT SEVEN;Nd;0;L;;7;7;7;N;;;;;
1166E;KAITHI DIGIT EIGHT;Nd;0;L;;8;8;8;N;;;;;
1166F;KAITHI DIGIT NINE;Nd;0;L;;9;9;9;N;;;;;
11670;KAITHI ABBREVIATION SIGN;Po;0;L;;;;;N;;;;;
11671;KAITHI FRACTION ONE SIXTEENTH;
11672;KAITHI FRACTION ONE EIGHTH;
11673;KAITHI FRACTION THREE SIXTEENTHS;
11674;KAITHI FRACTION ONE FOURTH;
11675;KAITHI FRACTION FIVE SIXTEENTHS;
11676;KAITHI FRACTION SIX SIXTEENTHS;
11677;KAITHI FRACTION SEVEN SIXTEENTHS;
11678;KAITHI FRACTION ONE HALF;
11679;KAITHI FRACTION NINE SIXTEENTHS;
1167A;KAITHI FRACTION FIVE EIGHTHS;
1167B;KAITHI FRACTION ELEVEN SIXTEENTHS;
1167C;KAITHI FRACTION THREE FOURTHS
1167D;KAITHI FRACTION THIRTEEN SIXTEENTHS;
1167E;KAITHI FRACTION SEVEN EIGHTHS;
1167F;KAITHI FRACTION FIFTEEN SIXTEENTHS;
8 Kaithi Specimens

![Plate I](image)

Figure 6: A comparison of the Kaithi script with the Devanagari and Mahajani (Grierson 1899: Plate I).

<table>
<thead>
<tr>
<th>Devanagari</th>
<th>Kaythi</th>
<th>Mahajani</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>अ</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>आ</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>इ</td>
<td>e</td>
<td>e</td>
<td>e</td>
</tr>
<tr>
<td>ई</td>
<td>i</td>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>उ</td>
<td>u</td>
<td>u</td>
<td>u</td>
</tr>
<tr>
<td>ऊ</td>
<td>u</td>
<td>u</td>
<td>u</td>
</tr>
<tr>
<td>ऋ</td>
<td>ri</td>
<td>ri</td>
<td>ri</td>
</tr>
<tr>
<td>ऌ</td>
<td>rī</td>
<td>rī</td>
<td>rī</td>
</tr>
<tr>
<td>ऍ</td>
<td>rī</td>
<td>rī</td>
<td>rī</td>
</tr>
<tr>
<td>ऎ</td>
<td>e</td>
<td>e</td>
<td>e</td>
</tr>
<tr>
<td>ए</td>
<td>e</td>
<td>e</td>
<td>e</td>
</tr>
<tr>
<td>ओ</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>औ</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

Table showing the corresponding forms of the Devanagari, Kaythi, Mahajani and English alphabets.
Figure 7: A comparison of the three regional forms of Kaithi, eg. the Tirhuti (Maithili), Magahi, and Bhojpuri. (Grierson 1899: Plate II).
Figure 8: A list of Kaithi conjuncts. These conjuncts appear to be of the Tirhuti (Maithili) variant of Kaithi since they do not appear in Magahi or Bhojpuri documents (Grierson 1899: Plate III).
Figure 9: Currency, weights, and measures signs that appear in Kaithi documents (Grierson 1899: Plate IV)
Figure 10: The position of the Kaithi script with regard to others (Naik 1971: Plate 28)

Figure 11: Inventory of Kaithi letters (Ojhā 1971: Plate LXXVIII)
Figure 12: Inventory of Kaithi letters (Śākyavamśa 1974: 64)

Figure 13: A table from kaiṭhī vo hindi barnamālā showing the Kaithi and Devanagari scripts in parallel. The Kaithi letters in this primer are drawn in conformity to the Devanagari style, most noticeable in the presence of the top-line (kaiṭhī vo hindi barnamālā 1882: 2)
TABLE 13.1: KAITHI OR KAYATHI SCRIPT WITH DEVANAGARI EQUIVALENTS AND TRANSLITERATIONS

<table>
<thead>
<tr>
<th>Vowels</th>
<th>a</th>
<th>o</th>
<th>e</th>
<th>i</th>
<th>u</th>
<th>\v</th>
<th>\u</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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Figure 14: “Kaithi or Kayathī script with Devanāgarī equivalents and transliterations” (S. Verma 2003: 502).

Figure 15: Excerpt from a specimen of Magahi written in Kaithi (Grierson 1903: 133).
Figure 16: Excerpt from a specimen of Maithili written in the Magahi style of Kaithi (Grierson 1903: 82).

Figure 17: Excerpt from a specimen of Maithili written in the Maithili style of Kaithi (Grierson 1903: 89).
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Figure 18: A specimen of Magahi printed in Kaithi type (Grierson 1903: 129).

Figure 19: The text from figure 18 typeset in the digital typeface accompanying this proposal.
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Figure 20: Excerpt from a specimen of Bhojpuri printed in Kaithi type (Grierson 1903: 202).

Figure 21: Excerpt from a specimen of Bhojpuri written in Kaithi (Grierson 1903: 214).
Figure 22: Excerpt from a plaint from the district court of Bhagalpur, Bihar (Bihar High Court of Judicature 1939).
Figure 23: Excerpt from a statement from the district court of Ranchi, Bihar (Bihar High Court of Judicature 1939).
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Figure 24: Example of Maithili style of Kaithi (Grierson 1899: Plate X)
Figure 25: Example of Magahi style of Kaithi (Grierson 1899: Plate XXVII)
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Figure 26: Example of Bhojpuri style of Kaithi (Grierson 1899: Plate XXVIII)
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Figure 27: The title page and first page of the Book of Genesis printed in Kaithi type (Calcutta Bible Society: 1851). The Kaithi font used here resembles Devanagari in the use of the head-line, but distinct Kaithi letters can be identified.
Figure 28: Chart comparing Devanagari, Kaithi, and other scripts (Naik 1971: Table 13).
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