W3C India

Draft Consultation Paper

for

Mobile Manufactures for enabling multilingual mobile services

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1. Introduction

The Web has gone mobile. All of the dynamic and interactive services of the Web can now reach the mass markets of millions and millions mobile users. At first, all the different technologies and concepts related to mobile browsing may seem overwhelming.

Accessing internet through mobile is seen as the future, hence enabling Indian languages on the mobile with parallel efforts enhancing the languages content on the web coupled by the development of various standards supporting these initiatives and our participation in such a global platforms is the ultimate long term goal. Interoperability is the key issue so that the dissemination of multilingual news and information can be handled seamlessly across service providers and variety of mobile available in the market. Perceiving the cellular phone to be the agent of change for inclusive growth, the challenge lies in enhancing the variety of the mobile applications and their localization, which in turn will accelerate the growth of mobile business in the country. The Mobile Web Initiative's goal is to make browsing the Web from mobile devices a reality

2. Vision and Objectives

W3C's mission includes ensuring that the Web be available on as many kind of devices as possible. With the surge of powerful mobile devices in the past few years, the role of the Web as a platform for content, applications and services on these devices is increasingly important.

W3C accompanies this growth with its ongoing work in the following areas:

- Mobile Web applications can take full advantage of the technical progress in the Open Web Platform, including HTML5, CSS3, and numerous JavaScript APIs— in particular device APIs who allow deeper integration with the hosting device

- The Mobile Web Best Practices and the Mobile Web Application Best Practices offer guidance to developers on how to create content and applications that work well on mobile devices.

3. Global mobile handset and smart-phone market share

Top Five Smartphone Vendors, Shipments, and Market Share, Q4 2010 (Units in Millions)

Vendor	4Q10 Units Shipped	4Q10 Market Share	4Q09 Units Shipped	4Q09 Market Share	Year-over-year growth
Nokia	28.3	28.0%	20.8	38.6%	36.1%
Apple	16.2	16.1%	8.7	16.1%	86.2%
Research In Motion	14.6	14.5%	10.7	19.9%	36.4%
Samsung	9.7	9.6%	1.8	3.3%	438.9%
HTC	8.6	8.5%	2.4	4.5%	258.3%
Others	23.5	23.3%	9.5	17.6%	147.4%
Total	**100.9**	100.0%	**53.9**	100.0%	**87.2%**

Worldwide smart-phone operating system (OS) market share in 2009-2015, (Source: Gartner (April 2011)**)**

OS (listed alphabetically)	2009 market share	2010 market share	2011 market share	2015 market Share
Android	3.9%	22.7%	38.5%	48.8%
BlackBerry	19.9%	16.0%	13.4%	11.1%
iOS	14.4%	15.7%	19.4%	17.2%
Symbian	46.9%	37.6%	19.2%	0.1%
Windows Phone/Mobile	8.7%	4.2%	5.6%	19.5%
Others	6.1%	3.8%	3.9%	3.3%
Total smartphones sold	172 million	297 million	468 million	631 million
Source: Gartner (April 2011)				

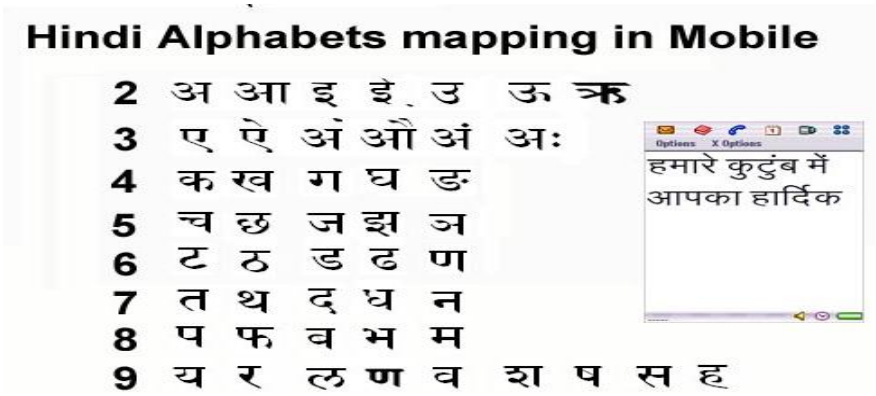
4. Requirements of mobile devices for Indic languages

4.1. Mobile Keypads

Mobile device input is often difficult when compared with use of a desktop device equipped with a keyboard. Mobile devices often have only a very limited keypad, with small keys, and there is frequently no pointing device. One of the difficulties of the mobile Web is that URIs is very difficult to type. Lengthy URIs and those that contain a lot of punctuation are particularly difficult to type correctly.

Multi-tap issues

- Too many taps per key for each char No way to know which char is on which Key.



- Never support more than one language on the keypad because there is not enough space on the key face to print more characters.

The various methodologies used to analyze and compare various keypad layout alternatives are explained in this section.

There are various metrics which can be considered for analyzing keypad layouts:

- Keypad clash
- Key-press count
- Keypad Error corrections effort
- Keypad distance

- 5. Keypad learning or intuition

Display

Indian language SMS requires support for efficient encoding as well as user friendly text-entry mechanisms and efficient display solutions with good accuracy and aesthetics. Indian scripts are complex in nature and have multi-tier structure with lot of ligatures. Accurate and legible display is the key to user readability and acceptability. As the display size and resolution varies across devices, scalable fonts as well as hand touch bitmap font are required for the desired result. Furthermore, Indian scripts being non-linear in nature, pose significant issues regarding display when the input sequence of characters are random.

These complex conjuncts are commonly in use in the respective native languages. The conjuncts and ligatures are well defined for all word forms in use by the respective language. Despite this, several issues still need to be resolved. These are briefly mentioned below:

- The increasing use of new words from the English and other languages has led to the introduction of new vowels, consonants or conjunct pronunciations for which no written conjunct or ligature forms exist.
- In almost every Indic script, there are several conjuncts that have multiple display forms that are accepted in common use (e.g. क ◌् त => Nत, ,).Implementers often confuse regarding the use of one standard form in such cases.
- However, development of more efficient Indian language fonts and font rendering technologies for mobile devices, especially low end phones, that have very limited resources has been a prohibiting factor for implementing Indian language support.
- A number of non-native and archaic characters have been introduced into the Unicode code pages of various Indic scripts, mainly for transcribing/transliterating from other scripts

The high-level requirements that should be fulfilled are as follows

- 100% accurate rendering
- Text legibility as good as in newspapers.
- Simple minimal glyph set for Indian scripts fonts.
- No ambiguity in character/conjunct shapes.
- Each valid key should display a meaningful character/glyph any time.
- Compact font files.
- Easy and quick to read for smallest size.
- Matching English fonts for bi-lingual texts

The Rasterizer engines need to be developed for Indian languages to over these problems. Draft SRS for the same is enclosed for feedback.

4.2. Fonts

Mobile devices often have few fonts and limited support for font sizes and effects (bold, italic etc.) As a result of this, the use of font size, face or effect, for example while underlining any Hindi statement it will be difficult interpret matras and may not achieve the desired effect.

There are 3 specific types of fonts

(i) Bit map fonts (used by low cost handset).

(ii) True type fonts (used by high end handsets)

(iii) Open type fonts (currently in wider use)

The bit map fonts are not scalable and hence one may require to provide various size of bit map font for different application purposes (menu, normal text, bold text, italic text, etc.)

True Type Font has a scalable rector graphic font where one requires having rasterization engine to convert the mathematical expression to bit maps on the fly.

Open Type Font also has an additional facility of positioning the justification and substitution mechanisms where it is more suitable for complex Indian scripts.

4.3. Operating System support

Symbian OS

Symbian OS has become a standard operating system for smart phones, and is licensed by more than 85 percent of the world's handset manufacturers. The Symbian OS is designed for the specific requirements of 2.5G and 3G mobile phones.

Windows Mobile

The Windows Mobile platform is available on a variety of devices from a variety of wireless operators. You will find Windows Mobile software on Dell, HP, Motorola, Palm and i-mate products. Windows Mobile powered devices are available on GSM or CDMA networks.

Palm OS

Since the introduction of the first Palm Pilot in 1996, the Palm OS platform has provided mobile devices with essential business tools, as well as capability to access the Internet or a central corporate database via a wireless connection.

Mobile Linux:

The first company to launch phones with Linux as its OS was Motorola in 2003. Linux is seen as a suitable option for higher-end phones with powerful processors and larger amounts of memory.

MXI

MXI is a universal mobile operating system that allows existing full-fledged desktop and mobile applications written for Windows, Linux, Java, and Palm are enabled immediately on mobile devices without any redevelopment. MXI allows for interoperability between various platforms, networks, software and hardware components.

List of mobile devices supporting different OS are:

OPERATING SYSTEM	VERSION	PHONES
SYMBIAN	**S60 3rd Edition**	**Nokia** 3250, 5500 Sport, E60, E61, E61i, E62, E65, E70, N71, N73, N75, N77, N80, N91, N92, N93, N93i
	S60 3rd Edition FP1	**Nokia** 5700, 6110 Navigator, 6120, 6121, 6290, E51, E63, E66, E71, E90, N76, N81, N81 8GB, N82, N95, N95 8GB. **Samsung** SGH-G810, SGH-i400, SGH-i450, SGH-i520, SGH-i550, SGH-i550w. **LG** KT610, KS10
	S60 3rd Edition FP2	**Nokia** 5320 XpressMusic, 5630 XpressMusic, 6210 Navigator, 6220, 6650, E52, E72, E75, N78, N79, N85, N96. **Samsung** I7110, INNOV8, SGH-L870
	S60 5th edition aka Symbian^1	**Nokia** 5230, 5800 XpressMusic, 5800 Navigation Edition, 5530 XpressMusic, C6, N97, N97 mini, X6. **Samsung** i8910 Omnia HD. **Sony Ericsson** Satio
	Symbian^3	**Nokia** E7, C7, C6-01, N8
	Symbian 6	Nokia 9210i Communicator, Nokia 9210 Communicator, Nokia 9290 Communicator
	Symbian 7	Nokia 3230, Nokia 6260, Nokia 6670, Nokia 7610, Nokia 9300 Communicator, Nokia 9500 Communicator, Sony Ericsson P800, Sony Ericsson P900, Sony Ericsson P910i
	Symbian 8	Nokia N70, Nokia 6630, Nokia 6680, Nokia 6681
Windows Mobile	**Windows Mobile 5.0**	Cingular 8125, Dell Axim X51, HP iPAQ 1950, HP iPAQ 2490, i-mate JASJAR, i-mate K-JAM, MDA Compact II, Palm Treo 700w, Qtek 9000

	Windows Mobile Smartphone 2002	SPV E100 (Orange)
	Windows Mobile Smartphone 2003	i-mate Smartphone SP3, Qtek 8010, Qtek 8020, SPV E200 (Orange), SDA (T-Mobile), Smartphone C500 (Orange), Samsung SCH-i600 (Verizon Wireless), Motorola MPx 220 (Cingular)
	Windows Mobile 2002	Dell Axim X5, HP iPAQ 1910, HP iPAQ 3150, HP iPAQ 3650, HP iPAQ 3760 (German), HP iPAQ 3970, HP iPAQ 5455, HP Jornada 565
	Windows Mobile 2003	Audiovox 5050 (Bell), Dell Axim X3, Dell Axim X5, HP iPAQ 2100, HP iPAQ 2210, HP iPAQ 2410, HP iPAQ 2700, HP iPAQ 4150, HP iPAQ 4350, HP iPAQ 4700, HP iPAQ 5550
PALM	**Palm OS 3.5.1**	Palm m105
	Palm OS 3.5.2	Handspring Visor Edge, Handspring Treo 300 (Sprint), Handspring Treo 270 (T-Mobile)
	Palm OS 4.0	Palm m505, Palm m500
	Palm OS 4.0.1	Palm m125
	Palm OS 4.1	Sony SJ30 / U, Sony CLIÉ 615C, Sony CLIÉ T415, Palm i705, Sony CLIÉ NR70
	Palm OS 4.1H	Handspring Treo 90
	Palm OS 4.1.1	Palm Tungsten W (AT&T)
	Palm OS 4.1.2	Kyocera 7135 (Verizon Wireless)
	Palm OS 5.0	Sony CLIÉ NX60, Palm Tungsten T (m550)
	Palm OS 5.2H	Palm Treo 600 (Sprint)
	Palm OS 5.2.1	Palm Tungsten T2, Palm Treo 600 (Verizon Wireless), Palm Treo 600 (AT&T), Palm Tungsten T3
	Palm OS 5.4	Palm TX, Palm Treo 650 (Verizon), Palm Treo 650 (Sprint), Palm Treo 650 (Orange), Palm Treo 650 (Cingular), Palm Treo 650 (AT&T), Palm Tungsten T5, Palm Tungsten E2
ANDROID	**android**	LG GW620, Sony Ericsson XPERIA X10, Samsung Galaxy, HTC Desire, Sony Ericsson Xperia X10**,** Motorola Milestone XT720**,** Samsung I9000 Galaxy S

8. W3C - Web of Devices domain

W3C has developed a number of Web technologies that explicitly take into account the specificities of mobile devices:

8.1. Mobile Web Best Practices

This document sets out a series of recommendations designed to improve the user experience of the Web on mobile devices. This Standard provides Sixty Guidelines to specifies best practices for delivering Web content to mobile devices. Visit http://www.w3.org/TR/2008/REC-mobile-bp-20080729/ for more details

8.2. Mobile SVG

The mission of SVG 1.0 specifically addresses small devices as a target area for vector graphics display. each mobile device has different characteristics in terms of CPU speed, memory size, and color support. To address the range of different device families, two profiles are defined. The first low-level profile, SVG Tiny (SVGT) is suitable for highly restricted mobile devices; while the second profile, SVG Basic (SVGB) is targeted for higher level mobile devices. Visit http://www.w3.org/TR/2003/REC-SVGMobile-20030114/ for more details.

8.3. Mobile CSS

This specification defines in general a subset of CSS 2.1 [CSS21] that is to be considered a baseline for interoperability between implementations of CSS on constrained devices (e.g. mobile phones). Its intent is *not* to produce a profile of CSS incompatible with the complete specification, but rather to ensure that implementations that due to platform limitations cannot support the entire specification implement a common subset that is interoperable not only amongst constrained implementations but also with complete ones.Visit http://www.w3.org/TR/2008/CR-css-mobile-20081210/ for more details.

8.4. XHTML for Mobile

The XHTML Basic document type includes the minimal set of modules required to be an XHTML host language document type, and in addition it includes images, forms, basic tables, and object support. It is designed for Web clients that do not support the full set of XHTML features; for example, Web clients such as mobile phones, PDAs, pagers, and set top boxes. The document type is rich enough for content authoring.

XHTML Basic is designed as a common base that may be extended. The goal of XHTML Basic is to serve as a common language supported by various kinds of user agents.

Visit http://www.w3.org/TR/2010/REC-xhtml-basic-20101123/ for more details

9. Indic language requirements

Priorities areas of Mobile Web Best Practices in India

- **[PAGE_SIZE_LIMIT]** Ensure that the overall size of page is appropriate to the memory limitations of the device.
- **[TABLES_SUPPORT]** Do not use tables unless the device is known to support them.
- **[STYLE_SHEETS_USE]** Use style sheets to control layout and presentation, unless the device is known not to support them.
- **[CONTENT_FORMAT_SUPPORT]** Send content in a format that is known to be supported by the device.
- **[CHARACTER_ENCODING_SUPPORT]** Ensure that content is encoded using a character encoding that is known to be supported by the device.
- **[DEFAULT_INPUT_MODE]** Specify a default text entry mode, language and/or input format, if the device is known to support it.

10. Indicative list of issues to which could be taken for collaborative problem solving developments by TCOEs

1. Compilation of Current mechanisms of supporting Indian Languages on selected mobile handsets and details of any patents, thereof.

2. Unicode compliance in Mobile OS.

3. Standardization of Indian language mobile keyboards.

4. Commitment of handset manufacturers to work with TCOEs regarding support of Indian languages in their handsets.

5. Mobile OS developers to integrate the Rasterizer engines in Indian Languages.

6. To study the adaptation of W3C standards

7. Compile the stakeholders who could be engaged for addressing the identified issues.

8. Suggested approach /Methodology to resolve a particular issue.