

To change the way the world writes

CleverTexting: An Indian technology

SMS (Short Message Service)

Writing SMS on the mobile phone (also called Texting worldwide) is currently a global preoccupation. A billion young people, millions of others are found tapping away on their phones as they sit in restaurants, at the bus stop and even while driving can be spotted twiddling their thumbs to be sending messages to their near and dear ones. It is estimated that there are 2.4 billion active users of SMS and that about 4 billion text messages are being sent globally everyday at an average cost of 10 cents US each.

But everyone of these users face an irksome problem each time. Composing text messages on the phone can be a slow and cumbersome process. Also complex, and your father is unready to learn it. A problem that technology has only partially solved. The challenge of supporting large alphabets on limited keypads. The challenge of making it simple to learn and easy to operate. The challenge of offering a faster means of typing which could axe the time taken to compose each one of those billion text messages. With the emergence of 3G and convergence on to the handheld device we are likely to be typing more often on some kind of a handheld device or your watch.

There are dozens of patents into how we could compose text using limited keypads. Let us introduce you to the major ways the world currently writes and then take you to the new way that the world could be writing.

The Ambiguous Keypad

First a little about what are called Ambiguous keypads.



The common keypads that we see on phones generally has a few characters of the English alphabet printed on each key of the numeric keypad of the phone instrument as shown in figure above. There are multiple schemes which are prevalent to use this keypad to enter text in English. Since in each of these schemes a keypress could mean more than one character of the alphabet, there is an ambiguity that arises which has to be resolved. Hence such keypads are called ambiguous keypads.

Multitap

The most common scheme to be used with ambiguous keypads is the Multitap scheme. In this familiar system, you press the same key multiple times in rapid succession to type a particular alphabet. Say you want to type C, you would press the key 2 (which has ABC on it) three times. This is quite slow, cumbersome and error prone but young people get fast at it over a period and there are many others who just do not get used to it. There is also an issue of a multitap timeout. Say, when you want to type the word ORDER, in which D and E are consequently on the same key (Numeric key 3). There has to be a delay between D (1 tap) and E (2 tap) to count as two different inputs otherwise 3 quick taps would result in the character F. This delay does slow down the system but is unavoidable.

Chording

Chording is a system in which you press two keys together to discriminate between different character inputs on the same key; quite like we use the shift key in the computer for upper case characters. But this scheme has failed to become popular on the handheld device for the usability reason that people can type only with one finger, their thumb.

Dictionary Matching

The Dictionary matching is another technology which is quite popular. In this scheme, you go on typing on the ambiguous keypad and the system tries to look up from dictionary words to match what you could be wanting to write. This works quite well for most commonly used dictionary words but every now and then you come across two different problems. The first is the dictionary collision, when the same numeric key sequence corresponds to two or more dictionary words. For example, the words “any”,

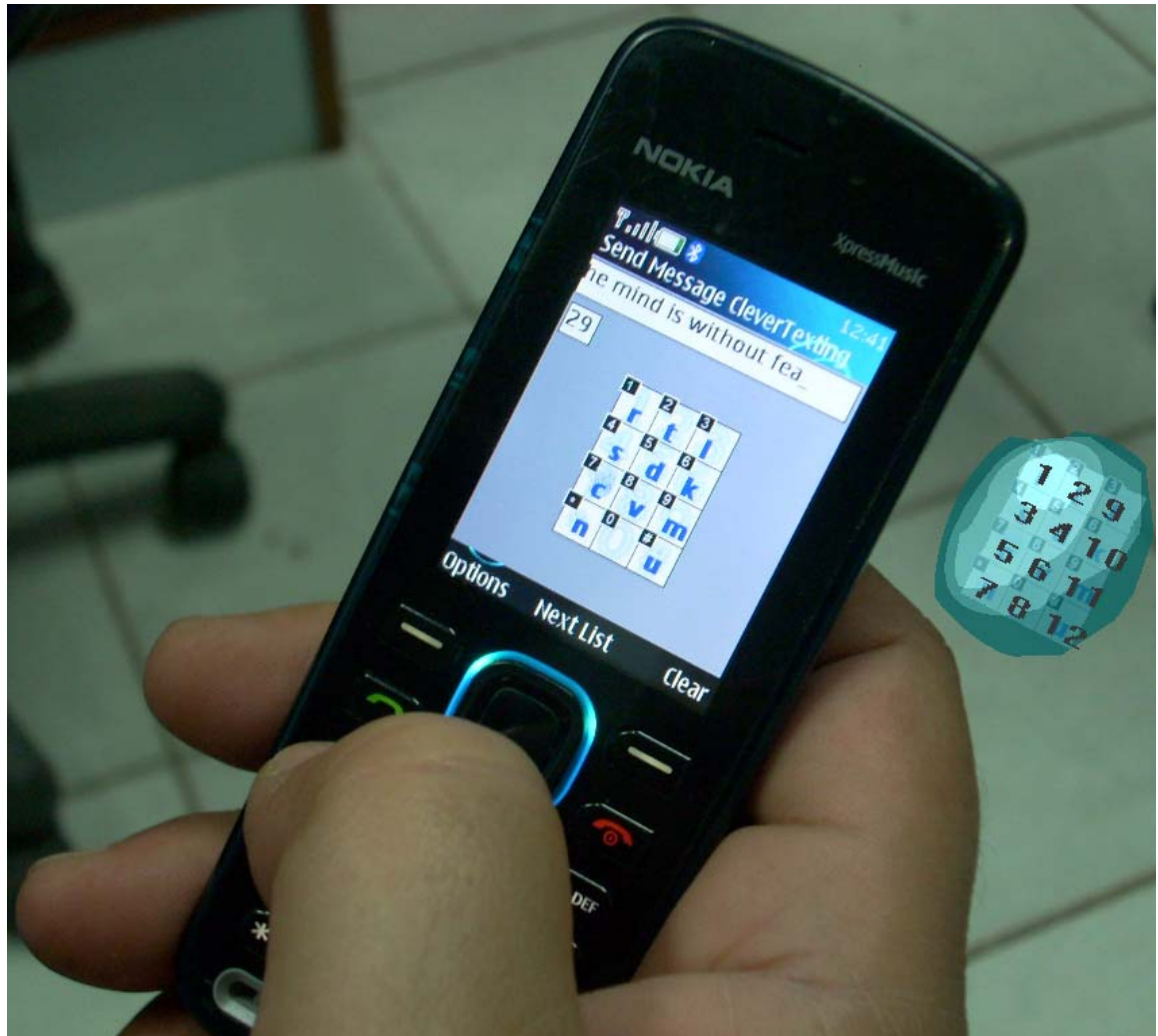
“boy”, “cow” and “box” share the same key sequence 2-6-9. The number of collisions are large and there are entire websites dedicated to these collision words. It is true that for a majority of key sequence, there is likely to be more than one dictionary word to match, but you notice it less because the dictionary suggests the most common words first.

The second more serious problem of the dictionary matching system is the issue of non dictionary words. The nature of the SMS usage is one in which there is a far higher incidence of proper nouns, names of places and people as compared to if you were reading a novel. A typical message goes like “Arun is waiting for Niket outside Shopprix Mall” In these 8 words, there are 3 non dictionary words in the middle. Whenever a non dictionary word occurs, the user has to change the mode to multitap mode (generally only after having given up on the dictionary after a few tries), an annoying interruption that is cumbersome and slows down the whole process. Many users do not know how to change the mode. Some of these errors occurring on the screen are overlooked because the user is looking at the keypad while typing and discovers the errors later and needs to correct them manually. This need for frequent interventions has led to even savvy users falling back on multitapping all the time even though some kind of dictionary support is available on most phones.

The new Indian technology : **CleverTexting**

Statistical Prediction

I can take a fine guess that your name is not “Vnjtlep”, nor is it “Rmatlwq”, but you could be reading a novel whose heroine is “Anades” or wearing a shirt whose brand is “Rotochi” or you could be living in a town called “Lomando”. These are possible and all the numerous others impossible. It turns out that the words that we use fall within a narrow spectrum of popular phonemes and syllables extant in a particular language. CleverTexting uses this insight to make a prediction about the limited, valid and the most likely alphabets you are likely to type next based on what you have typed just before and is armed with the statistical information on the nature of the overall language and usage. This experimental strategy has yielded excellent results because the predictions are almost always on the mark. CleverTexting then allows you to choose from the list of predictions it has made from the screen using the numeric keypad using a single keystroke, instead of multitap or some other disambiguation.



CleverTexting predicting the most likely characters following what has been entered and placing them into positions easiest to reach for your thumb (See comfort contours and ergonomic ranks). And the arrangements would change when held in the left hand.

Dictionaryless

CleverTexting does not use a dictionary. In fact there is no dictionary at all, only statistical tables. This makes it perform equally well across dictionary and non dictionary words, because non dictionary words also follow the same rules of phoneme usage. Being without a dictionary it is also very lightweight and can be implemented with low complexity and very little demands, (in about 10 Kb), for example in phone memory, into semiconductor chips or even inside SIM cards while selling phone connections.

User Interface Innovation

CleverTexting uses a major user interface innovation too. In this patent pending model, there are no keys mapped permanently to the keypad. Any character can be assigned to any key and this is done dynamically all the time. But this also results in any character being always typed with a single keystroke. Also you don't need to look for the alphabets on the keypad and the screen at the same time. You only look at the screen and type and can operate CleverTexting without your glasses or in darkness. There are other small innovations everywhere that makes it easier for common tasks like changing from lowercase to uppercase.

But this model is also a paradigm shift from how people have been typing so far, so it is unintuitive at first, but once one understands how it works, then onwards its very easy and rewarding. It offers a pleasant feeling that the phone appears to know your mind as you are typing while at the same time you like the control it offers you.

Unambiguous Keypad

At any point of time, a key on the keypad represents only one character of the alphabet. Hence CleverTexting is an unambiguous keypad scheme. CleverTexting does not need any alphabets printed on the numeric keypad. Therefore it can support any number of languages on the same phone by just making a mode change or a software change. Easy to implement by just switching the statistical tables. No printing of alphabets from multiple languages in the limited space on the face of the keypad.

Treating all the keys of the keypad with complete generality leads to an explosion of possible user options at each decision node by a number which is equal to the number of total keys on the keypad. And only the most likely and valid possible next characters are offered in each dynamic key assignment.

Easy to learn and teach

Only two rules

1. If the character you want is on the list, press the key indicated.
2. If its not on the list, press the Next list key.

And its always Single Keystroke typing.

Several Modes

Several variations of CleverTexting implementations have been developed to suit specific user preferences and age groups. And yet other modes are under development.

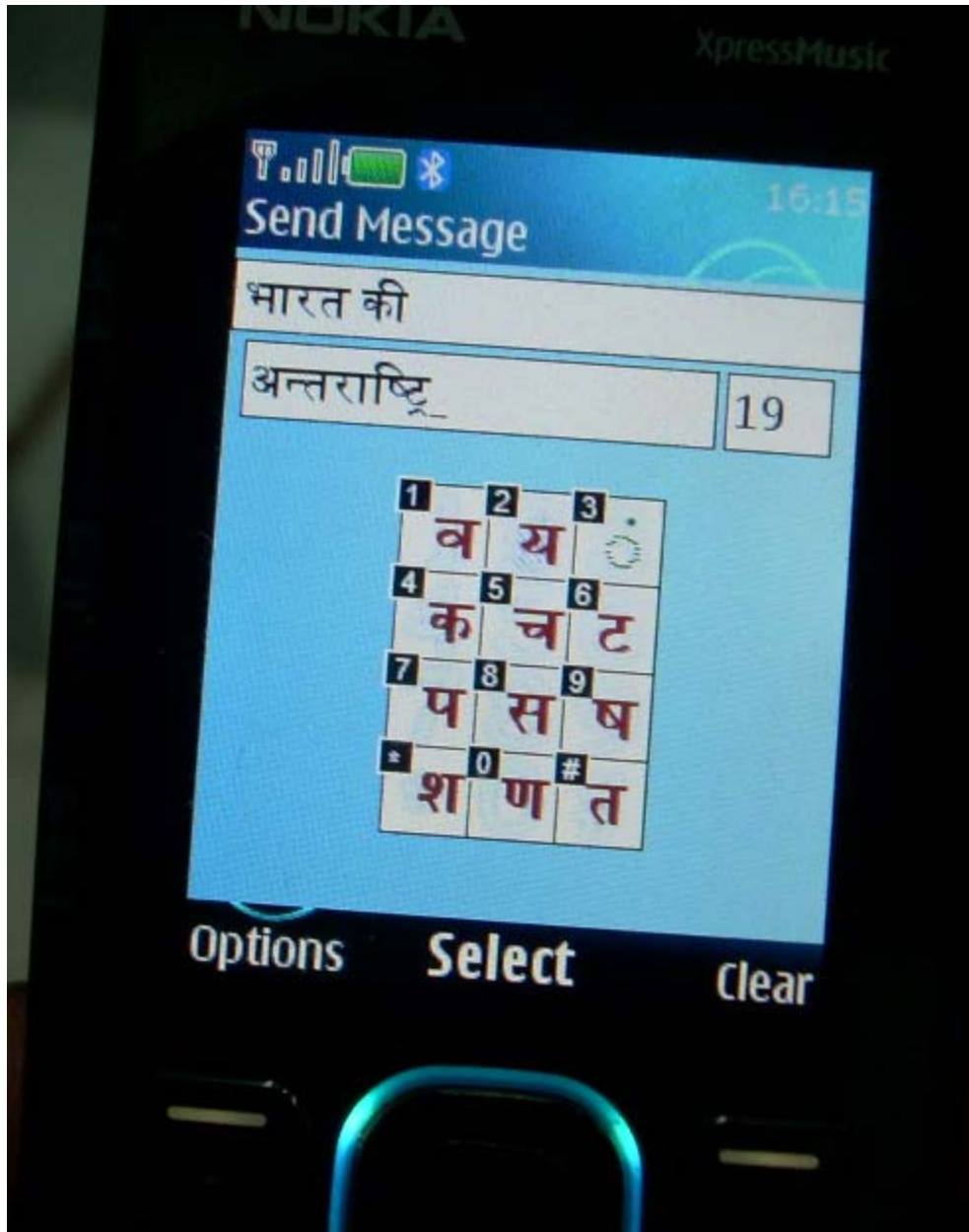
1. **Ergonomic** : In the Ergonomic mode, alphabets which are most likely to be used next are placed in positions which are easiest for the thumb to reach on the phone. Since this arrangement varies when the phone is held in the Right hand and Left hand, the user is allowed to choose which hand he is using.
2. **Legacy** : In the Legacy mode, alphabets are assigned to positions that they occupied in the original keypad. For example, JKL of key 5. Heavy users of multitap habitually reach for these keys.
3. **Nearest Key** : In the Nearest key mode, the most likely alphabets crowd around the last used key, hence one can type with the smallest thumb movements, often on the very same key.

Advanced Statistics

Statistics is everywhere in CleverTexting, like which are the characters most likely at the beginning of a sentence. Which are the characters most likely at the beginning of a word. A surprise here is that the most frequently occurring English character by far, the letter e, (occurring 10% of the time) does not find place in the first eleven when it comes to characters likely to begin a word. CleverTexting deals with statistics on which is the character likely to begin a word following one which has ended in a particular character. And so on. Its only going to get better as work continues.

Language Implementations

The statistical nature of every language is different. For example, in romanised Hindi “Shubham” is a word, but there are no words in English usage that uses the phoneme ‘bh’. Shu is uncommon too. In Poland you would have Grzegorz or Mięczyłowski and Nyumbizi in Swahili, Africa. Hence CleverTexting needs to have a separate implementation for differing languages and locales for the most optimal performance for a user. It is easy by just switching the statistical tables. CleverTexting has been released for the English language for the global audience and work is on for other language and script implementations.



Statistical Prediction (CleverTexting) working on Hindi, the majority language of India.

SMS Compression

CleverTexting also offers compression of your SMS for the first time. You can compose a message and then choose to compress the message before transmission. This allows you to pack in more text into your standard SMS length for the same cost. The decompressed message is displayed automatically at the other end. But the other end must have the CleverTexting application installed on the phone for decompressed messages to show. The compressed format also offers confidentiality during transmission of your messages.

TouchScreen Version

A touchscreen implementation of CleverTexting has also been developed. This model has offered such great usability that some have suggested that this model would attack the keypad of the PC.



CleverTexting being used on a Touchscreen phone.

Advantages of CleverTexting

- A smoother seamless typing experience.
- Faster typing, no interventions, no multitaps, no mode changes.
- Single keystroke typing
- No need to look at the keypad and the screen, only look at the screen.
- Support of any number of languages
- Improves spelling habits
- Easy to learn and operate for everybody, including the aged.
- A general purpose texting tool on the phone which is used for composition of text messages, as well as other functions like address book, music selections etc.

- The concept of CleverTexting can be applied to other limited keypad devices like set top boxes, instrument panels, the television remote and others to improve usability.

Target Markets

- Handset Manufacturers who can implement CleverTexting on their phones.
- CleverTexting is tiny enough for Telecom Service Providers to include the texting technology as a value add in the SIM Card along with the phone connections.
- Telecom Service Providers can also include the application in their Ondeck services. Better usability technology increases VAS revenues and expands the size of the user segment who can now use SMS conveniently and more frequently.
- Compression makes mobile marketing more viable and other enabling information services technically feasible.
- Resellers dotting the rural map who help users install the application on their phones and charge a small fee.

Free Distribution to Endusers.

A time limited software implementation of all the modes of CleverTexting in one application (a 162 Kb Java application) is available for free download from the website. One can use this application to compose, compress and send messages from their phone. You can download this to your phones from your computer over USB cable or Bluetooth or directly to your phone via GPRS. The latest versions of the software are always made available on the website www.CleverTexting.com as work continues with better prediction and superior compression. You are free to distribute the application to your friends or make it available on your website/blog.

CleverTexting is a Mobile Texting Technology from the Indian startup myMobile Ergonomics and was released on the 31st Dec 2008. Two patent applications for the technology has been filed. The company has developed another integrated technology for composition and interoperation in and between all Indian languages called Panini. The details are at www.PaniniKeypad.com

Ready for Demonstration at any time at our location.

Incumbent Technologies

- **T9 and XT9 - Nuance Communications (NASDAQ NUAN)**
- **iTap - Motorola Lexicus Division**
- **eZiText - Zi Corporation, Canada (NASDAQ ZICA)**
- **SureType - RIM**
- **Letterwise, Wordwise, EQ3 – from Eaton, USA.**

Others

- **Phrase-it from Prevalent Devices**
- **TenGo from Xrgomics**
- **Adaptxt**

- **AirTx tx4u**

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