

# Thumbs up to a new way of texting?

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Love it or hate it, mobile phone text messaging has become a dominant means of communication in our culture. In the US, the number of text messages sent overtook mobile phone calls in the second quarter of 2008 (source: Nielsen Mobile). Its popularity in developing countries, particularly in India, China and the Philippines (where texting is said to have played a role in deposing the former president, Joseph Estrada, in 2001), is growing faster still.

Sending a text message has become easier as technologies compete to reduce the number of key presses required to type each word. Dictionary-based predictive text input was originally introduced in the 1970s, and has many applications including improved accessibility for those with motor disabilities. It uses an algorithm to search a dictionary for a list of possible words that match the user's key press combination. For mobile phones it is seen by many as an improvement on the original multi-tap system; indeed, if a message contains only dictionary words, performance can approach that of using a QWERTY computer keyboard.

Multi-tap, in contrast, requires 13 key presses to type the word "hello" (4433555555666), with an additional pause for 'multi-tap timeout' (or pressing a predefined 'next' key) because the two adjacent 'l's share the same key. This problem arises because mobile phone keypads are 'ambiguous', that is, there are less keys than letters in the alphabet, so each key represents several letters. Multi-tap is particularly challenging for those with motor difficulties, and heavy users are at risk of texting-related injuries.

By disambiguating the mobile phone keypad, dictionary-based predictive texting reduces the number of key presses needed. But if it is so much better, why do so many people

choose to stick with the more laborious multi-tap? There are a number of problems, with predictive texting which manufacturers have tackled in various ways.

'Textonyms', groups of words produced by the same combination of key presses, such as 'good', 'home', 'gone', 'hood', etc., (in this case, 4663), present ambiguities, and users have to choose between such words using a predefined key. T9, the most widely used predictive text dictionary system, has the ability to 'learn' which words you are most likely to type, and offer these first.

The problem of non-dictionary words, including many proper nouns, abbreviations, and slang, or misspelt words, is harder to crack. Users need to revert to multi-tap if the dictionary does not recognise the word, or they can manually add words to a personal dictionary. Given that the character limit on text messages makes abbreviations attractive, and that texting is primarily a social communication tool (and therefore contains a higher incidence of proper nouns than that in, for instance, a novel), this drawback is enough to put many users off dictionary-based predictive systems.

One proposed solution, claiming to tackle the above issues, is a technology called CleverTexting (patent pending), created by an Indian startup company, myMobile Ergonomics. It is a dictionary-less text prediction system based on the statistical occurrence of groupings of letters in each language, and hence works as well for proper nouns as it does for dictionary words. The system makes predictions on which letter you are likely to type next, based on the last letter you typed, even if that was in the previous word. Even the first letter of a message has a statistical probability associated with it. For instance, whilst the letter 'e' is the most

frequently occurring letter in English, it is much less likely to begin a word.

CleverTexting offers a rather unusual method of interaction: dynamic key assignment. It assigns different letters to each key, according to which letters it predicts you are most likely to type next. The key assignments appear on the screen and change as you type, which makes for a bizarre and (initially) uncomfortable user experience. The user must constantly look at the screen and respond to the changing key assignments; an experience particularly alien to experienced multi-tap users, who barely need to glance at the screen.

There are three modes: 'ergonomic', 'nearest key' and 'legacy'. In ergonomic mode, the most likely letters you are expected to type next appear grouped around the keys closest to your texting thumb (users can choose between left- and right-handed options). The use of the word 'ergonomic', in this context, is interesting. Yes, cutting down on the distance moved by your thumb may bring certain physical ergonomic benefits but the cognitive ergonomic benefits - 'learnability' in particular - are less clear. In traditional texting systems, the user only needs to learn a single set of unchanging key positions. Using CleverTexting, it is difficult or maybe impossible to 'learn' the likely letter positions you will be offered. It would be interesting to see how easily a non-texter would become proficient in such a system, compared with multi-tap or dictionary-based predictive systems.

In legacy mode, the key assignments always match those of traditional mobile phones, and statistical prediction is simply used to offer the most likely of the three or four letters associated with each key, first. There is less learning to do, however it is still necessary to observe the screen to see what letter is being offered.

Whichever mode you choose, the use of statistics here is powerful; as the user types, the predictions the system makes are often right. However when they are not, the user has to scan the screen for the letter needed,

moving onto the next screen if it does not appear. This can be frustrating. The problem is that CleverTexting has simultaneously implemented two technologies: statistical prediction and dynamic key assignment.

There is much potential here, but its current implementation may prove too radical for habit-based texters to take on board. Taking out the dynamic key assignment, statistical prediction combined with dictionary tables may offer similar benefits, without the steep learning curve. On the other hand, CleverTexting opens up new possibilities for touch-screen phones; the developers have had favourable feedback from users who benefit from the limited character set and hence bigger virtual keys, making typing easier.

A promising technology, but don't take my word for it; try it out for yourself. The latest versions can be downloaded at [www.CleverTexting.com](http://www.CleverTexting.com). ❖

