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Autumn 2015

Viable options for replacing QWERTY

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Can we quit QWERTY?

As technology changes, are there solutions available to replace QWERTY? Ellis Pratt looks at viable options.

The chances are that, the next time you are typing, you’ll see the letters QWERTY under your fingertips. This keyboard layout has been the popular design for over 125 years, and although it was never arranged to optimise the typist’s speed (instead to minimise the number of key jams on a mechanical typewriter), it has become the de facto standard for computers, tablets and smartphones today.

Most of us type at between 30 and 80 words per minute, with little motivation to change. However, with the increase in presenting information through both video and text based media, there may a need to look at alternatives to QWERTY.

As a consequence of the rise in popularity of video presentations and animated tutorials, we’re seeing some content begin in that format and then need to be transcribed into text. In our case at Cherryleaf, we found ourselves with hours of training videos that needed to be updated where we didn’t have a script. We had to transcribe the trainers’ words, in order to have a text to work on.

For others, there’s also a need to provide subtitles on videos, so they meet equality legislation requirements.

You might be wondering why this would cause a problem. The issue is that people tend to speak at between 160 and 200 words per minute, which means you can’t keep up with them when you’re typing. It takes professional typists four to six times as much time to transcribe good quality audio as the duration of the audio itself, and it takes two fingered typists a lot longer. The result is that transcribing speech to text can take an enormous amount of time if you are using a standard keyboard.

In looking for a solution, most people start by looking at dictation software, such as that which comes built into the Windows 8 and Apple OS/X Yosemite operating systems, and Dragon Naturally Speaking. For years, these applications have promised users the capability of speaking normally and seeing their words appear faithfully as text on the screen, and for years the software has *almost* delivered on that promise. We’ve found it fine if you are using a headset and are speaking slowly at fewer than 100 words per minute, but we didn’t get satisfactory results when we tried to use it to transcribe recordings of someone talking at normal speed.

The other issue is the accuracy of the software. These applications promise 92%-99% accuracy, which seems impressive until you realise that could mean an average of one error every twelve and a half words. Try as we might, we could never get the software to distinguish between “DITA” and “data”. We also found it tiring to talk to a computer for long periods of time.

The automated closed captioning on YouTube appears to be even less accurate. If you look, you’ll see it struggles to transcribe Stephen Fry’s voice accurately, so there’s little hope for the rest of us!

Alternatively, you could pay for a transcription service to provide you with the text. You send them an audio file, and they return the transcription in the following 24-48 hours. They typically charge between £2 to £5 per minute of audio, which means that lengthy recordings could prove to be expensive.

There are alternative keyboard layouts to QWERTY, such as Colemak and Dvorak, which are supported by Windows and OS/X. These offer better comfort to typists, but there isn’t much evidence to prove they provide any significant speed benefits over a QWERTY layout.

You would have thought in the past 125 years someone would have come up with an effective solution to transcribing the spoken word. And of course, someone had.

Stenotype machines have been around since the early 1900s, enabling court reporters and other professional transcribers to type at up
Writing

to 330 words per minute. Real-time machine stenography is a system that lets users enter words and syllables by pressing multiple keys simultaneously in a chord, which is then translated instantly into English text. This makes stenography the fastest and most accurate text entry method currently available.

Unfortunately, this speed has meant the manufacturers have been able to charge around $3,000 (approximately £1,930) for a stenotype machine and $4,000 (approximately £2,580) for the stenography software. On top of that, people in the USA looking to be certified as a court reporter typically need to pay $30,000 (approximately £19,300) in training school fees in order to learn stenography to the required speed of 225 words per minute.

A few years ago, a professional stenographer realised that the only way to spread the benefits of high speed efficient text entry to the programmers, writers, subtitlers, and anyone else who might need it, was to make the stenography software free and the hardware cost far less. She collaborated with some programmers, including one working at Google, and together they developed an open source stenography application called Plover.

Plover offers the promise of enabling you to transcribe speech in real time – at a conference, in a meeting, from a recording, and so on.

Plover acts essentially as a keyboard emulator. You enter the syllable-by-syllable "brief" for a word on your keyboard and Plover converts this, using a dictionary stored as a text file, to the appropriate English word, in whichever application you are using at the time. For example, if you enter the steno brief "THAUT" (Figure 1), Plover will convert this to the English word "thought".

The 22 key layout and the chorded nature of stenography means "THAUT" would be entered in a single movement involving five fingers, as opposed to the seven strokes it takes to write the word "thought" letter by letter on a QWERTY keyboard.

For a variety of reasons, laptop and some USB keyboards limit you to pressing six keys (plus modifiers) at once. This means you can’t use these with Plover, as some stenographic briefs can involve twenty keystrokes at the same time. In practice, you need to use a keyboard that recognises at least 16 simultaneous key presses (this is known as “N-Key Rollover”, see Figure 3), and these typically cost between £50 to £100. In our case, we ended up buying a 3D printed, dedicated USB stenographic keyboard called the Stenoboard (Figure 4), which costs around £150. Other low-cost stenotype machines are being developed, including the wonderfully named Stenosaurus.

This requirement means you cannot really use Plover for spontaneous writing on a laptop. You need to attach the keyboard, and, in order to have the correct finger positioning for stenography, the steno keyboard needs to be positioned at the height where your arms can make a right angle whilst you’re writing.

To quote Mirabai Knight, founder of Plover:

"The basic problem is this: If it’s (a keyboard) small enough to fit in a pocket, it’s too small to type on efficiently. If it’s too big to fit in a pocket, it’s too inaccessible to be available on the spur of the moment. There are two potential solutions to the problem. One, clothing-integrated or clothing-mounted text input. Two, virtual space text input. The first one is easy enough to visualize. The second one is pretty far out there."

This leads us to two announcements at Google’s I/O 2015 conference (https://events.google.com/io2015).

Google announced an initiative to make clothes into wearable computers called Project Jacquard. According to Google, Project Jacquard makes it possible to weave touch and gesture interactivity into any textile using standard, industrial looms. Everyday objects such as clothes and furniture can be transformed into interactive surfaces.

It also announced Project Soli. According to TechRadar, Soli utilizes a revolutionary "gesture

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1 Knight M (2010) ‘Mobile and wearable computing’ Plover, The Open Source Steno Program
(accessed July 2015)
radar” chip to pick up a variety of natural hand motions, such as scrolling on a virtual screen, turning a wheel, and pinch zooming. The goal of both Project Jacquard and Soli is to make wearable user interface possible with easy broad gestures.

In a few years’ time, we could be writing and transcribing text in real time, using Plover and a virtual stenographic keyboard woven into our Levi 501s.

So can we quit QWERTY? With practice, speeds of 160–180 words per minute should be attainable for most people (and higher speeds for others) with Plover today. However, we may need to wait until wearable keyboards take off before we see any significant move away from QWERTY.

Further reading:
- Plover website http://plover.stenoknight.com
- Open Steno Project website http://openstenoproject.org
- Kevin Oliver, This is Google’s plan to turn your clothes into wearable devices, May 2015 www.techradar.com/news/wearables/google-atap-wants-to-make-your-clothes-smart-1295366 (accessed July 2015)
- Project Jacquard website www.google.com/atap/project-jacquard
- For The Record Trailer #1, Marc Greenberg, February 2014 www.youtube.com/watch?v=ZxAEmqbaMCE (accessed July 2015)

Ellis Pratt MISTC is a director at Cherryleaf.
E: ellis@cherryleaf.com
W: www.cherryleaf.com
Tw: @ellispratt
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