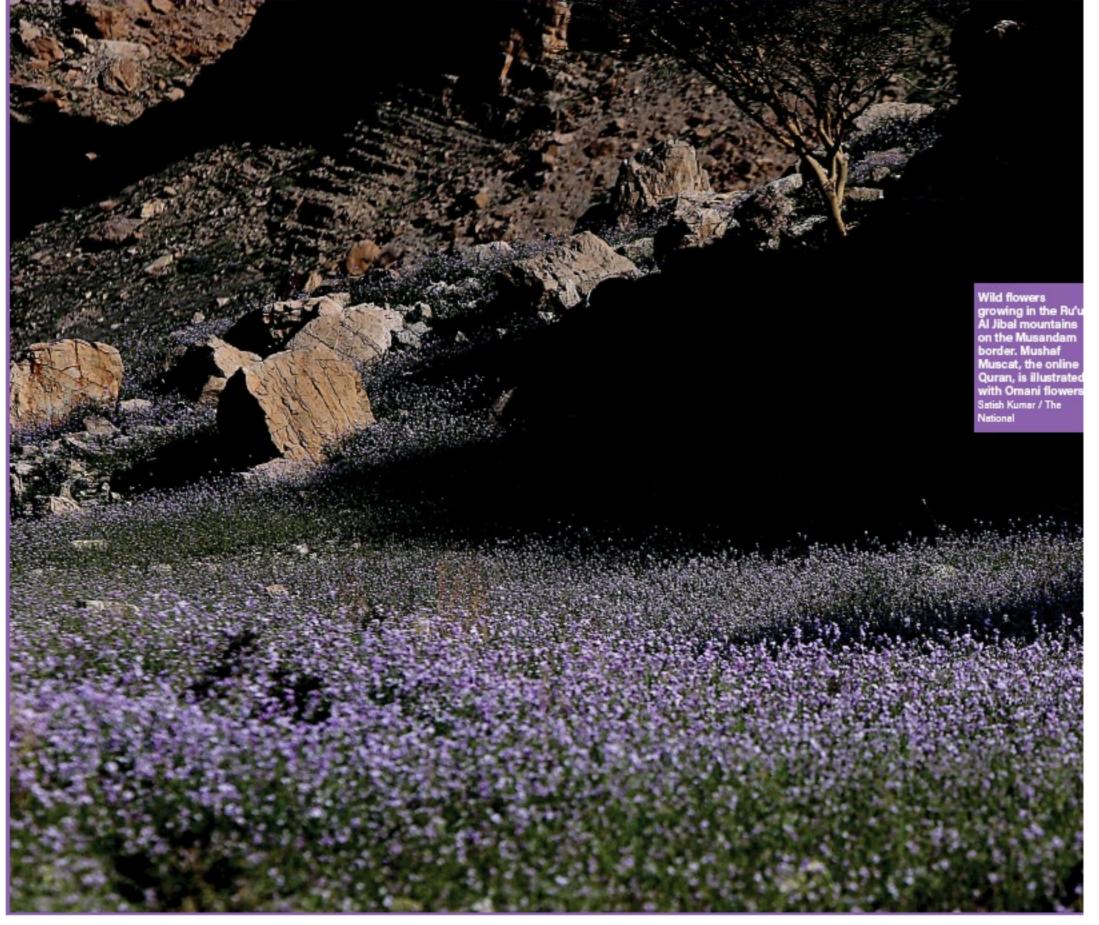# How the Quran was made Google-friendly

A typographer and his team partnered with the Omani government to produce the world's first interactive online Quran in which text can be copied and searched. Anna Zacharias tells the story

The National - News 27 Jul 2017 The Mushaf Muscat e-Quran can be found online at www.mushafmuscat.com

This [was] comparable to having one of the best orchestras performing Mozart Symphony Number 40... and then it's distributed on a system that plays it locally as a Nokia ringtone

Wild flowers growing in the Ru'us Al Jibal mountains on the Musandam border. Mushaf Muscat, the online Quran, is illustrated with Omani flowers

The text in Mushaf Muscat is derived from Naskh script from the Ottoman period, top, and Kufic script from eighth century Quranic fragments in Yemen Courtesy Thomas Milo

When Thomas Milo was a young man, he was presented with a page of instructions on how to type in Arabic. He was, to put it mildly, displeased.

"I was insulted that the idea that a civilisation that prides itself on a millennium-and-a-half of graphic culture was described in half-a-page of typewriter-style instructions," says the Dutch inventor and typographer, born in 1950. "It clearly, clearly exploded in the face of reality."
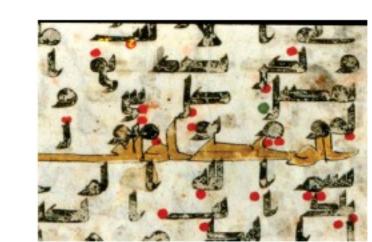
His dissatisfaction with Arabic fonts eventually led him into a new career and he founded his own typography company in 1985, enlisting his wife and brother-in-law in his battle against "pragmatic, industrial" Arabic fonts.

They founded the company DecoType with a simple goal: instead of designing Arabic for technology, DecoType designed technology for Arabic.

The team of European inventors then joined the Omani government to create the world's first web Quran, which launched last month.

Mushaf Muscat is the first searchable, online Quran that guarantees the integrity of Islam's holy text.

The project began in 2008 when Milo's work on Arabic typography caught the eye of Sheikh Abdullah bin Mohammad Al Salimi, Oman's Minister for Endowments and Religious Affairs, who was touring the Netherlands and attended a talk Milo gave at the University of Leiden.

Impressed, he asked if Milo could build a web Quran. At that time technology could compromise the integrity of the online text.

As the word of God, the Quran cannot be changed. When fonts are used, letters can change or disappear between one computer and another. There are no guarantees that what is sent will be received unaltered.

Additionally, the idiosyncratic spellings of the Quran risked being obliterated by zealous autocorrect programmes.

"This is comparable to having one of the best orchestras performing Mozart Symphony Number 40, perfect in pitch and intonation, and then it's distributed on a system that plays it locally as a Nokia ringtone," explains Milo. "This is the reality."

To avoid this, online Qurans are usually static PDFs. But this is equally unsatisfactory, according to Milo, because they are unsearchable copies of text rather than a true Quran of the internet. "It would be as dead as a doornail. So for us the PDF was a non-starter," says Milo.

These constraints made digitisation of the Quran, in Milo's words, "a snake pit", but it was also an irresistible challenge.

The solution surfaced five years after the original discussion, as two major programmes became widespread across browsers.

The first was Unicode, an encoding system that assigns a unique numeric value to every letter, digit or symbol.

There were hundreds of different systems and programmes before Unicode set an international standard for text interchange. Milo refers to Unicode as the "Geneva Convention" for tech companies that are otherwise battling in a competitive market.

The second was Scalable Vector Graphics (SVG), compact imaging technology that gained popularity after its adaptation by Wikipedia.

DecoType's software engineer, Stan Jesmanowicz, built a script using graphic primitives, the simplest form of geometric shapes that work as building blocks.

With just 400 shapes, billions of accurate images of Naskh script can be generated, each consistent with traditional calligraphy. These are delivered with SVG, ensuring that the same image is seen on every screen. Milo says: "All the browsers have been upgraded to handle Scalable Vector Graphics, for different reasons and by doing so they created the platform to escape from the clutches of conventional computer typography."

The result is a choose-yourown adventure Arabic script scenario. What it means is that a reader can use the Mushaf Muscat in manuscript view, where verses begin with flowers, or in printed Quran mode, where verses start with numbers, as was popularised in 1924, in Cairo.

They can also view it in interactive mode and alter the script using software developed by Milo's brother-in-law, aircraft engineer Peter Somers.

Click on a word and a menu drops with variations on the various ways the word can be written. Each column controls a different variable, like elongating or stacking, or making a loop open or close.

A rough comparison in English handwriting would be differences in how the "T" is crossed or how the circle of the letter "O" is formed.

All of these variations use the same typeface and are applied within the rules of calligraphy.

With font, elongation is simply a dash that can be put anywhere in the word. To a calligrapher, this is disastrous. Arabic fonts are rigid and consequently rife with errors, says Milo.

For most of his life, the entrepreneur worked to escape the clutches of conventional computer typology. Milo founded DecoType after having worked as a truck driver in Saudi Arabia and a translator for the United Nations Interim Force in Lebanon.

He sees the liberation of Arabic from typesets as a revolutionary act against major corporations whom he believes lack an aesthetic appreciation of Arabic script.

That said, DecoType has worked with companies such as Adobe and Microsoft, and its fonts

The opening chapters of the Quran in the Mushaf Muscat. On the right is the first chapter Al Fatiha (The Opening) and on the left are the first verses of the second chapter Al Baqarah (The Cow)
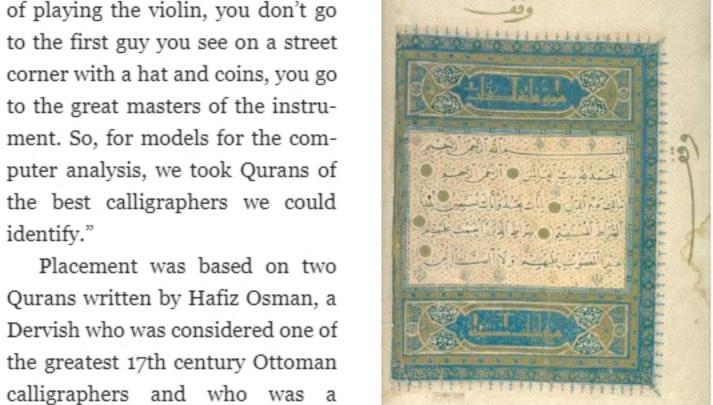
DecoType Ruq'ah and DecoType Naskh will be familiar to users of Microsoft Office and its Apple counterpart, Pages.

When it came to designing the web Quran, Milo and his colleagues looked to the masters.

"In order to understand the art of playing the violin, you don't go to the first guy you see on a street corner with a hat and coins, you go to the great masters of the instrument. So, for models for the computer analysis, we took Qurans of the best calligraphers we could identify."

Placement was based on two Qurans written by Hafiz Osman, a Dervish who was considered one of the greatest 17th century Ottoman calligraphers and who was a founder of the Ottoman school of calligraphy.

The web Quran's main script was designed by Milo's wife Mirjam Somers and derived from the Naskh script of Ottoman Qurans.

Produced for five centuries across an empire spanning from Yemen to Algeria to Hungary, these Qurans were abundant and remarkably consistent.

The chapter headings are written in Kufic script inspired by eighth century Quranic fragments that came fluttering down from the rafters of the Great Mosque of Sana'a during a renovation in 1972.

The manuscripts that had insulated the mosque's roof fell for centuries on the heads of workers,

Mushaf Muscat has received worldwide praise, from Islamic scholars to software engineers

who collected 12,000 fragments and stuffed them into potato sacks to be thrown away. They were discovered by the Yemeni director of antiquities and given to the German scholar Gerd-Rüdiger Puin for analysis. He sent 140 coloured slides of the 12,000 fragments to Milo, who worked with the industrial designer Hozan Zangana to put together a digitised version.

The web Quran has a touch of Oman about it too, thanks to designer Lara Captan. Its colours and patterns were inspired by Oman's landscape, flora and architecture.

In a tip of the hat to Oman's maritime heritage, the verses can be navigated with a circular astrolabe that works as table of contents.

The original Qurans would be illegible to many modern readers. In the style of their time, they omitted the dots that distinguished letters like a "T" and a "B", and even omitted some letters entirely.

The calligraphers of Osman's manuscripts helped readers by discretely writing the missing letters above, in miniature.
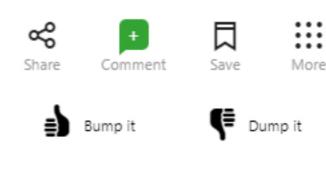
For the purist, Mushaf Muscat can be viewed in its skeleton form of plain black script. Three tiny buttons add layers for clarity. The first adds the dots, and hidden letters reappear in red. The second layer shows vowel substitution and the third layer adds Quranic punctuation. Any changes can be saved to PDF.

Mushaf Muscat has garnered praise across the board, including from Islamic scholars at Al Azhar in Egypt and from software engineers like Mark Davis, the president and co-founder of Unicode.

Davis described it as "a powerful tool for Islamic students and scholars, allowing people around the world to interactively explore the variety and flexibility of Arabic typography".

Richard Ishida, internationalisation activity lead at World Wide Web Consortium, which sets the base standards of the internet, labelled it "an impressive blend of aesthetics and functionality which, by harnessing the power of web standards, allows access to the rich typographic traditions of the Arabic script".

For Milo, it is a timely adaptation of a timeless manuscript. "The Quran is the most important artefact of Islamic civilisation," he says. "This is the fantastic contradiction: an icon of tradition and resilience against change, promotes the innovation of global computing to go into overdrive."

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