BBC Box

Thanks to BBC Box, you might be able to enjoy personalised services without giving up all your data. **Sean McManus** reports

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One day, you could watch TV shows that are tailored to your interests, thanks to BBC Box. It pulls together personal data from different sources in a household device, and gives you control over which apps may access it.

"If we were to create a device like BBC Box and put it out there, it would allow us to create personalised services without holding personal data," says Max Leonard.

TV shows could be edited on the device to match the user's interests, without those interests being disclosed to the BBC. One user might see more tech news and less sport news, for example.

BBC Box was partly inspired by a change in the law that gives us all the right to reuse data that companies hold on us. "You can pull out data dumps, but it's difficult to do anything with them unless you're a data scientist," explains Max. "We're trying to create technologies to enable people to do interesting things with their data, and allow organisations to create services based on that data on your behalf."

Building the box

BBC Box is based on Raspberry Pi 3B+, the most powerful model available when this project began. "Raspberry Pi is an amazing prototyping platform," says Max. "Relatively powerful, inexpensive, with GPIO, and able to run a proper OS. Most importantly, it can fit inside a small box!"

That prototype box is a thing of beauty, a hexagonal tube made of cedar wood. "We created a set of principles for experience and interaction with BBC Box and themes of strength, protection,
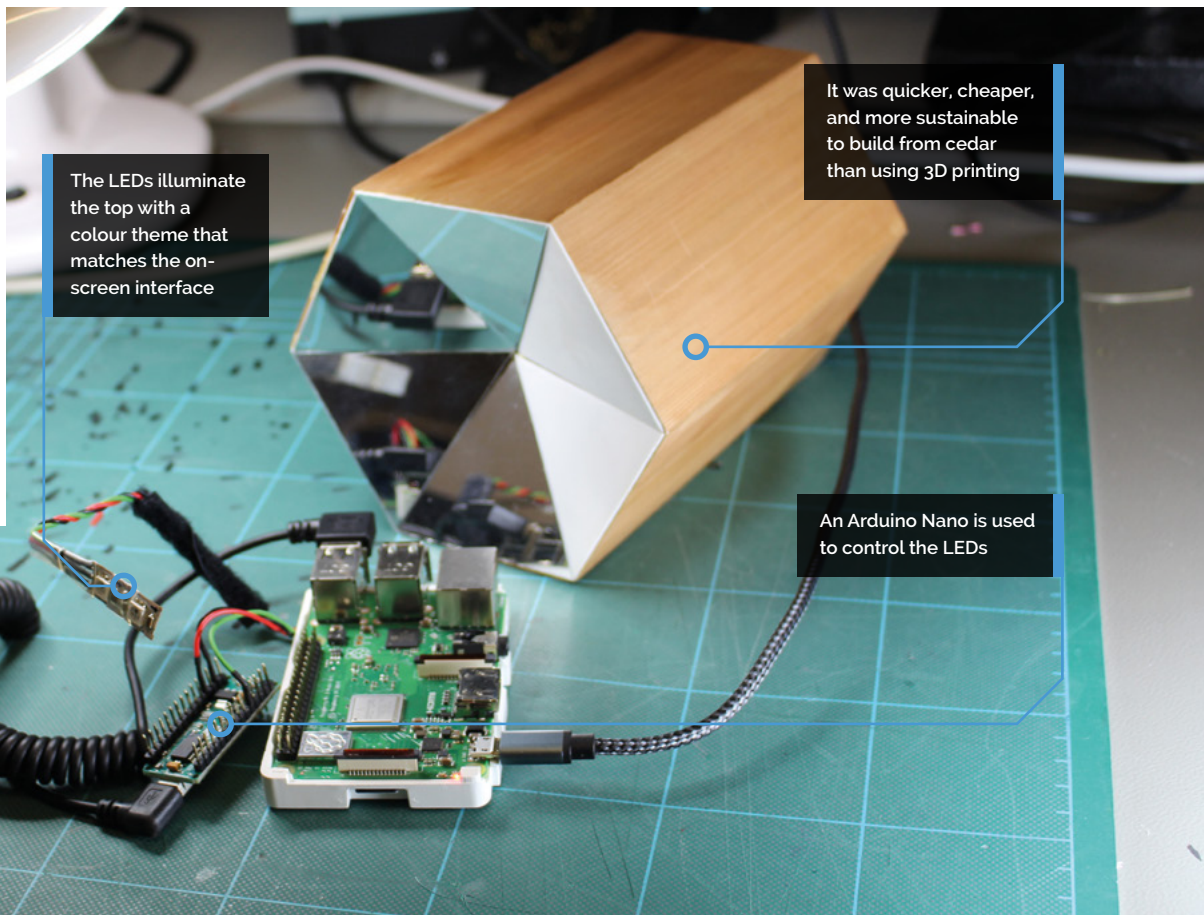
The LEDs illuminate the top with a colour theme that matches the on-screen interface

It was quicker, cheaper, and more sustainable to build from cedar than using 3D printing

An Arduino Nano is used to control the LEDs

▲ You manage your BBC Box apps using a companion device with a web browser, such as a tablet

▲ The travel app enables people to collaborate on holiday planning without disclosing places they don't want to visit

and ownership came out very strongly," says Jasmine Cox. "We looked at shapes in nature and architecture that were evocative of these themes (beehives, castles, triangles) and played with how they could be a housing for Raspberry Pi."

The core software for collating and managing access to data is called Databox. Alpine Linux was chosen because it's "lightweight, speedy but most importantly secure", in Max's words. To get around problems making GPIO access work on Alpine Linux, an Arduino Nano is used to control the LEDs. Storage is a 64GB microSD card, and apps run inside Docker containers, which helps to isolate them from each other.

Combining data securely

The BBC has piloted two apps based on BBC Box. One collects your preferred type of TV programme from BBC iPlayer and your preferred music genre from Spotify. That unique combination of data can be used to recommend events you might like from Skiddle's database.

Another application helps two users to plan a holiday together. It takes their individual preferences and shows them the destinations they

▲ Your data is stored on a device in your home, rather than online. You control which apps can use it

> ❝ Raspberry Pi is an amazing prototyping platform. Most importantly, it can fit inside a small box! ❞

both want to visit, with information about them brought in from government and commercial sources. The app protects user privacy, because neither user has to reveal places they'd rather not visit to the other user, or the reason why.

The team is now testing these concepts with users and exploring future technology options for BBC Box. 🅼