

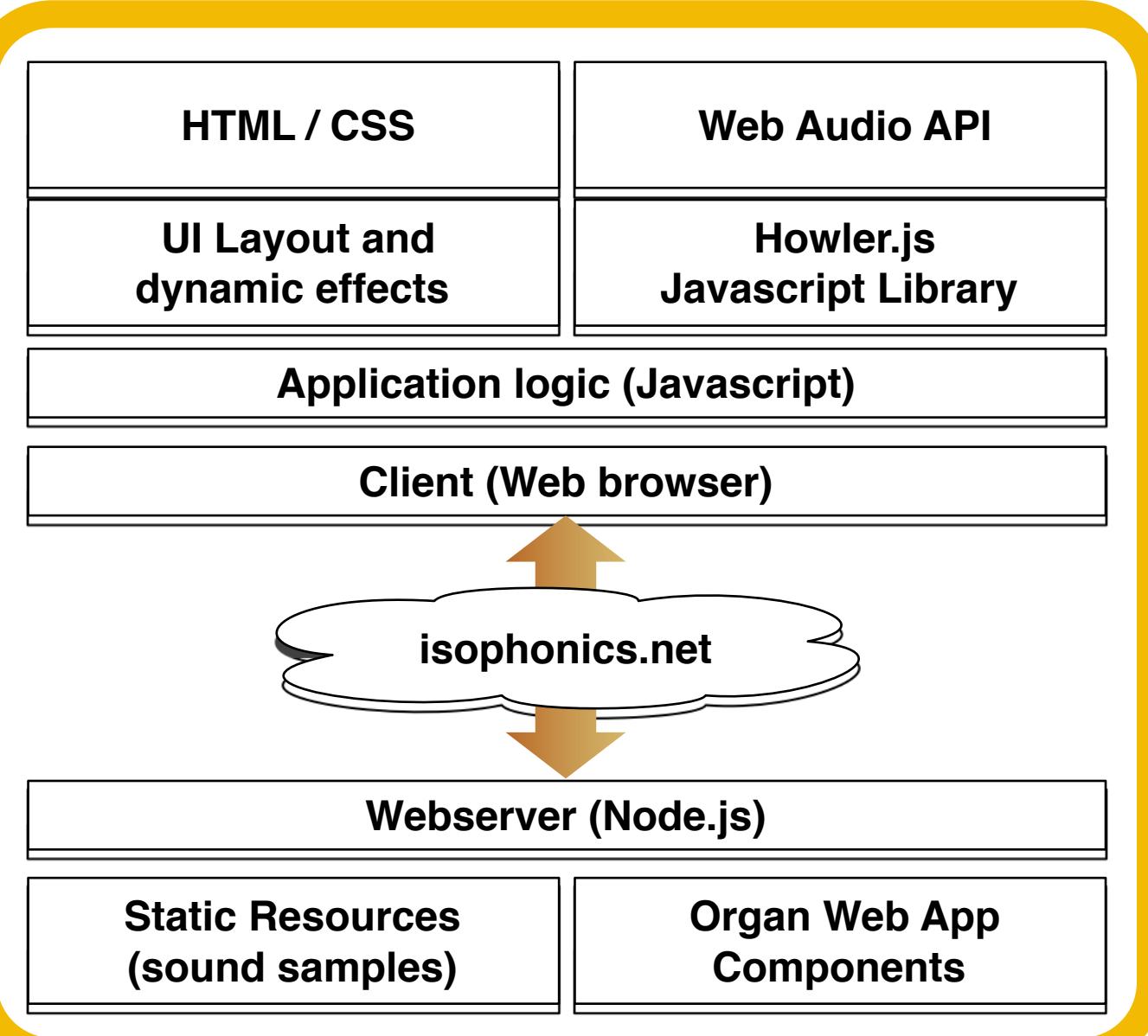
The Organ Web App

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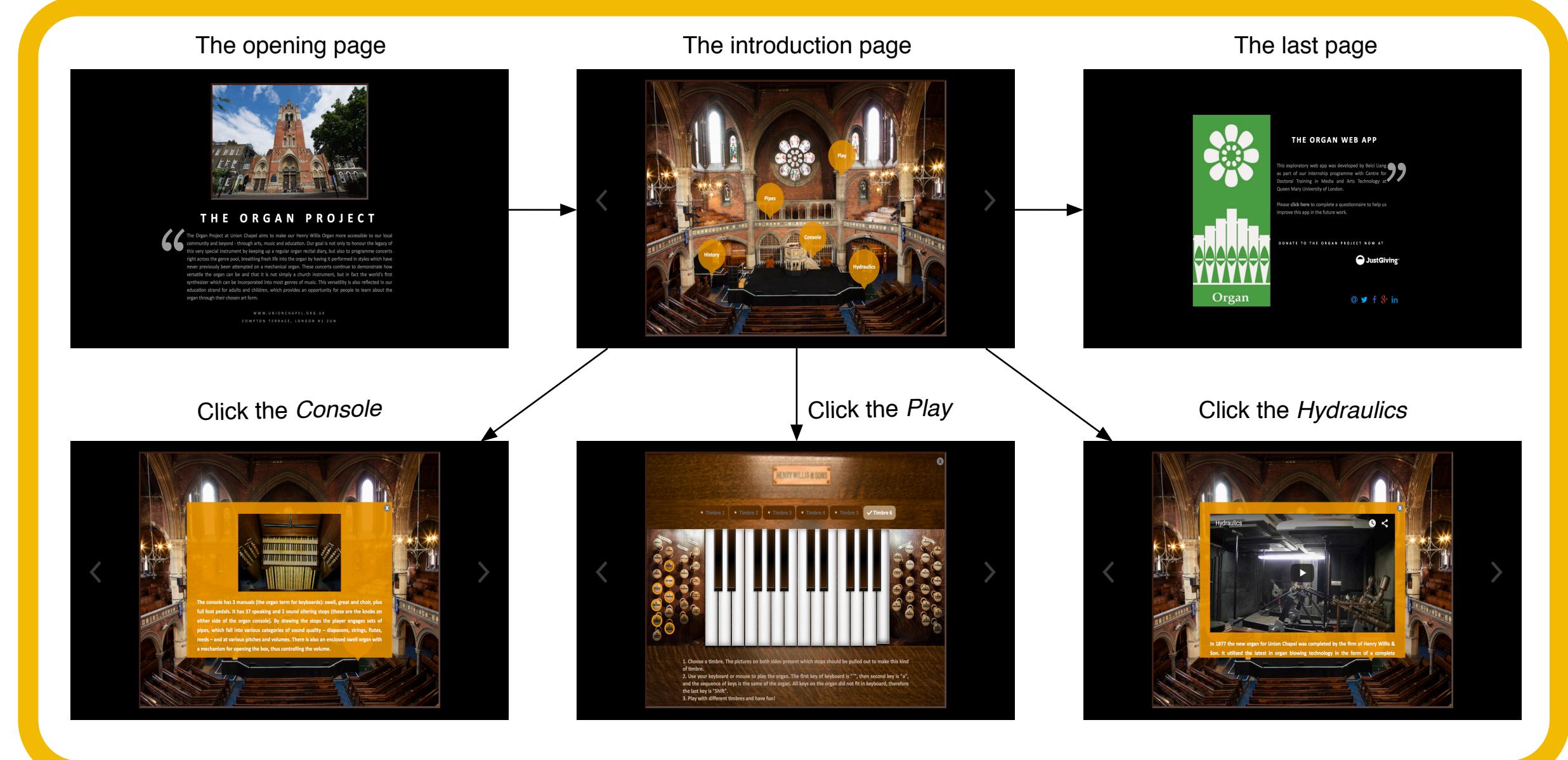
1. Overview

- The Organ Web App is developed as part of the Organ Project undertaken by the Union Chapel in London, UK.
- It is a web audio application that presents different aspects of the Chapel's Henry Willis pipe organ, including its history, pipes, console and hydraulics.
- The app features a collection of audio samples of six different timbres from the organ in order to let users play it using computer keyboard or mouse.
- The Web Audio API was used as the primary audio engine for sample-based synthesis.
- Positive and negative aspects of the app were identified using an online questionnaire.

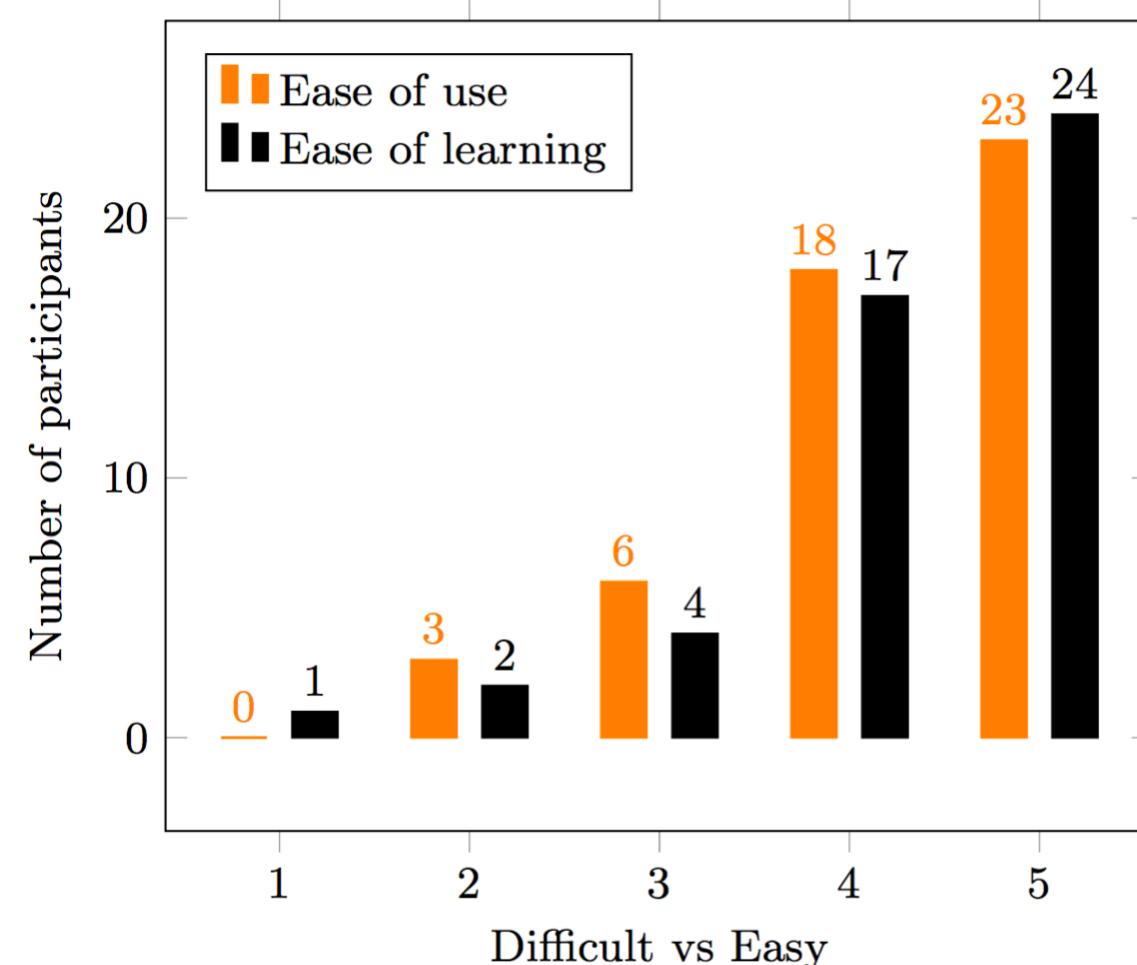
2. Architecture



3. Implementation



4. Evaluation



5. Improvements

- Although the role of the app is primarily educational, it was suggested that the duration of the sound should depend on the duration of the note played on the key, hence sample-based synthesis was considered to improve the app.
- Sonic Visualiser [1] was used to extract the envelope of the pre-recorded organ sound samples.
- A fixed number of cycles of periodic waveform from the sustain section was stored for looping.
- The organ sound fades in once the user plays the note, then the audio file loops as long as the user holds the key, and finally the sound fades out when the user releases the note.
- The size of the samples were also reduced in order to minimise the overall load time when a timbre is selected.

6. Conclusions

- With the help of web technologies, The Organ Web App achieved the goal of The Organ Project which was to let more people familiarise themselves with the Henry Willis pipe organ.
- The Web Audio API provides a powerful mechanism to retrieve, playback and manipulate audio content.
- Sample-based synthesis was considered as an improvement which allows for looping the sustain part of the audio samples and thus enables us to reduce the size of the audio files holding the samples.
- The app was well received by users according to an online survey.
- The improvements will be evaluated and a comparative study with the previous version of the app will be conducted in our future work.
- The Organ Web app is freely available to be used in the latest version of FireFox, Chrome and Safari at <http://www.isophonics.net/organapp/index.html>.

[1] Cannam, Chris, Christian Landone, and Mark Sandler. "Sonic visualiser: An open source application for viewing, analysing, and annotating music audio files." *Proceedings of the international conference on Multimedia*. ACM, 2010.

[2] Canning, Rob. *Real-Time Web Technologies in the Networked Performance Environment*. Ann Arbor, MI: MPublishing, University of Michigan Library, 2012.