

AccelOne created a custom application which enables the virtual configuration of high-end audio equipment from both web and mobile devices.

- C# and .NET desktop applications that connect via USB port to target hardware equipment
- Custom firmware for audio equipment
- Unity-based mobile application that communicates via Bluetooth to the target hardware equipment.

Virtual Audio Management

Bluetooth-enabled audio device management and configuration application

AudioControl is an award-winning designer and manufacturer of high-end audio equipment.

The Challenge

AudioControl, located in the Greater Seattle Area, is an industry leader in the development of sophisticated home and car audio equipment technology such as digital signal processors, distributed audio systems and amplifiers, audio analyzers, and calibration equipment.

Currently, there is no one else in their industry who offers such a flexibility and wide range of connectivity options which places AudioControl in a leading position within the Car Audio market.

However, in order to bring their business to the next level, AudioControl wanted to develop a unique dashboard-based application which would allow virtual device configuration from a desktop computer and mobile devices.

AccelOne was asked to create this application which would be developed for desktop computers running Windows OS in the initial phase, and then for mobile and tablet devices for more widespread adoption and use.

The greatest challenge that AccelOne faced on this project was creating a sleek, simple, user-friendly application which could manage the highly complex and sophisticated logics that would be transmitted to and from AudioControl's devices. Additionally, the information would need to be communicated through USB and wirelessly via Bluetooth and stored in the devices memory.

“This project was unique in that it not only required coding software, but pioneering unique solutions for the hardware devices, as well.”



What We Did

Using the Agile Framework, we broke this project down into two phases, each with three iterations: 1) design, 2) development and 3) user acceptance testing (UAT). Phase 1 would result in the final completed desktop application for Windows and Phase 2 would result in the mobile application for iOS and Android, based in Unity.


We configured a team of two senior-level developers to work on this project which included a Senior Audio Engineer & Software Developer and a Senior Unity 3D Developer.

With the team in place, we exposed all of the hardware parameters for each of the devices in order to understand their nuances. Then we gathered all user stories and requirements from the project stakeholders and researched other similar applications to find proven concepts and technologies to apply to this project in order to maximize our efficiency and minimize budget.

“Collaboration,
innovation and
communication were
key to this project’s
success.”

The first phase of the application, which was completed in 3 months, was built under C# .NET to run on Windows OS and connect to the target hardware, such as a car amplifier, via USB cable. The communication between the hardware, which contains a powerful 32-bit microcontroller from Texas Instruments, and the Windows application was accomplished by creating a custom piece of firmware from scratch from C language. Once completed, the entire application system allowed for the configuration of the controller from the Windows application, which was created from a UX-first approach and easy for the user to adopt.

Once the initial phase was delivered, tested, and accepted, the second phase of the project was initiated. This phase of the project was also written with C# language but using a different platform: Unity 5.0. This framework allowed us to quickly and easily build software that runs on the most popular environments, such as Apple’s iOS, Windows, Mac OSX, Linux, Android, etc. This portion of the project involved developing a very unique, groundbreaking feature in the Car Audio market: enabling Bluetooth communication to an amplifier. We decided to use this method after several discussions with the client about the best protocol to communicate the amplifier using a mobile device and discovering that the best method would be Bluetooth. However, no such solution currently exists in the market. So, we accepted the challenge of selecting the optimal Bluetooth LE (Low energy) hardware for this purpose and writing the code from scratch for both the mobile application and the amplifier itself.



The hardware and software feasibility have been proven successful and we already have a fully working mobile application that communicates via Bluetooth with the amplifier.

Results

The delivery of both phases of the application were successful, as they were completed on-time, within budget and accomplished all of the performance requirements. It has made a very positive impact on the business for the client, giving them a clear competitive edge in their market, making this project a positive return on investment for their company.

Finally, the introduction of the Bluetooth-based mobile application Car Audio market made this project not only a success for our client, but for the industry.

“The most notable thing about this project was the groundbreaking development of the Bluetooth solution, which is the first in its market.”



AccelOne provides custom software development services for US companies. We believe that attention to communication is paramount to delivering quality software, and essential to insuring successful outcomes for our clients.

Headquartered in Seattle, and with its nearshore development center in Buenos Aires, Argentina, AccelOne has a senior management team with more than 80 years of combined experience in the IT Industry, working with well-known multinational enterprise, medium sized businesses and early stage companies.

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