

For over 15 years, Anthem has been setting the standard for sonic excellence in every product category it offers. Anthem's focus on providing the best in performance and value continually pushes the boundaries in audio/video receiver design.

When this international manufacturer decided to integrate multimedia capabilities in stereo audio receivers, it turned to Crank™ Software for their expertise in embedded user interface (UI) development solutions.

Technical Challenges

- Integrating multimedia capabilities into a line of audio/video receivers. Rather than being pass-through devices, the manufacturer wanted to provide a high level of interaction with consumer media devices such as iPods and USB devices, and provide that support natively within the receiver. To achieve this goal, the manufacturer needed to provide an enhanced graphical display user interface/user experience (UI/UX) that would be more than just a dial to select video and audio sources.
- Building in scalability across product lines. The UI/UX needed to be consistent across a low-end and a high-end system. Adding to the complexity, the UI on the low-end product had to match a third party's UI.
- Leveraging investments. The manufacturer wanted to leverage the development in the low-end system, yet enable the high-end system to have a completely custom UI.

Solution

The manufacturer required a turnkey solution for the low-end product. Few companies have the [embedded development expertise](#) to complete the integration at the level that the manufacturer required, the experience working with the multimedia system the manufacturer was using, and an [embedded UI development solution](#) that optimizes hardware performance on resource-constrained devices. The team at Crank Software has a strong background in and understanding of real-time embedded systems—they understand memory constraints, CPU constraints, and prioritization of tasks. Crank Software offered the manufacturer the expertise and tools required to achieve the project objectives.

Benefits

Leverage R&D Investment; learn from the experts. Crank Software delivered the UI for low-end system using the Crank Storyboard™ Suite of embedded UI development solutions; the manufacturer's development team will develop the high-end system.

Scalability and portability. Now that Crank Software has separated the business logic from the system logic, the manufacturer's development team will be able to easily reskin and reapply the UI to the high-end system. Storyboard provides the foundation that will ensure portability across OSs, hardware platforms, and CPU versions—without re-designing the UI.

Easy to use tooling solution. Storyboard provides a tooling solution that allows the manufacturer's development team to easily edit screens to modify the UI.

Quick and easy integration points. The system takes advantage of the fact that there are multiple ways of driving products. From a testing point of view, even if a piece of the system isn't integrated with a command set, the development team can advance the project schedule by prototyping, developing, and testing in advance of the hardware being ready. The Storyboard plugin interface makes integration with third party multimedia systems quicker.



UI development optimization solutions

The Crank Storyboard Suite enables UI designers, with no programming experience, to drag-and-drop their UI designs and do this in parallel with, yet independently from, the engineers who are working on the coding. Storyboard simplifies the design process, saves valuable time, and leverages the core skills of each valued member of the team.

What sets Storyboard apart from other solutions?

There are lots of great choices out there. Here's what we believe makes Storyboard the best choice.

- **Adobe Flash** is effective for graphical displays on the desktop because that's what it was designed for. It wasn't designed for the performance constraints of an embedded platform. Storyboard was architected exclusively for embedded systems, which have the unique challenges of bringing a rich UI experience to resource-constrained embedded devices.
- **Microsoft Silverlight** is effective for embedded systems on the Microsoft Windows platform. Most manufacturers don't want to handcuff themselves to one platform though. Storyboard runs on Windows, Windows CE, Linux, Mac OS X, QNX—and supports any hardware that your OS supports.
- **Flash and Silverlight** only scale down so far, basically requiring an embedded device that has a lot of horsepower, so neither are suitable for devices below certain price points.
- **Are other solutions hardware- and OS-agnostic?** Storyboard runs on Windows, Windows CE, Linux, Mac OS X, QNX—and supports any hardware that your OS supports.

Helping customers to accelerate time to market, achieve high ROI and low TCO

Choosing the right UI development suite for a product roadmap is a strategic decision that could deliver long-term competitive advantage. Storyboard is proven to:

- Reduce the development cycle from months to weeks—accelerate time to market by 60%;
- Reduce development costs;
- Reduce CPU usage—the Embedded Engine uses 30-80% less CPU; and
- Achieve 30 frames of animation per second on resource-constrained hardware.

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Storyboard is the ideal solution to design graphical displays for resource-constrained embedded devices; for example, consumer electronics, automotive infotainment systems, and industrial devices.