



LocoLabs

Case Study: Virtual Platform Design Bright Things "Bubble" Electronic Toy

Great product ideas can come from anywhere. For John Kavanagh, developer of some of the world's greatest video games (we're talking Lara Croft here, folks), the inspiration for his latest idea was his pre-school son. After retiring from the video game business, John spent much of his time playing with his son, which led to his idea for a unique educational video game. John envisioned utilizing high-quality video from popular children's television programs, along with a patented advanced IR remote, to create a fun and easy-to-use educational game for preschoolers. John had the idea and knew how to develop video games – what he needed was a proof-of-concept to get the idea off the drawing board and in front of investors and developers.

Proof of Concept

John called LocoLabs on a Thursday with his idea. Brad Hoffert and Steve Kelsey, founders of LocoLabs, listened as John described his vision and his need for a proof-of-concept for the game console. Brad and Steve asked John to come back on Monday to flesh out the idea and discuss how to move forward. Instead, when John returned, Brad and Steve handed him a prototype console that met his need for a proof-of-concept. How were they able to do it over a weekend?



LocoLabs Technology Modules

LocoLabs LLC is a Silicon Valley product design services company that has been creating new products for its customers since 1999. LocoLabs specializes in an approach to embedded system design that emphasizes a balance between hardware and software. This approach inspired LocoLabs to develop technology modules that can be reused, with simple modifications, for different projects. Utilizing LocoLabs's library of technology modules (USB, LCD display, touchpad, handheld, battery, power), Brad and Steve were able to quickly put together a hardware device for John to use as a proof-of-concept prototype console. As John met with developers and investors and the product features expanded (audio storage, playback, and compression were added), LocoLabs was able to quickly adapt and further develop the initial proof-of-concept.

Flexible Hardware Platform

From his experience in the video game industry, John understood that the individual games that play on a game console are the main source of value in any gaming system. The time and expense necessary to license content and develop games need to be leveraged across many possible hardware consoles. The initial game console developed was a standalone console that a child would hold in his or her lap. Other consoles in the works included a handheld model and one that was integrated with a DVD player. Also, the consoles needed to support peripherals such as dance pads, card readers, and sports equipment. To realize a profitable return for a new game, it must be flexible enough to work on any form of console. Re-authoring a game for each console would be unacceptable.

Bubble Virtual Platform

LocoLabs's balanced approach to embedded system design, with well-defined API layers, was a perfect match for developing the product that resulted from John's vision: the Bright Things "Bubble" game console and an array of entertaining and educational games. LocoLabs provided a customized virtual platform, which effectively isolated the game developer from the underlying hardware of the game console. Artistic game developers were provided with a customized game scripting language along with a game compiler – this gave them the freedom to quickly script a new game without having to concern themselves with how the underlying interfaces (buttons, LEDs, IR commands) or peripheral interfaces were implemented.

Flexible Volume Manufacturing and Dynamic Test Fixturing

Transferring any consumer product from prototype to high-volume offshore manufacturing is a complex endeavor. The Bubble presented the additional complexity of bringing together complex electronics, enclosure pieces, console software, and game software (in various stages of development) in time for the Christmas season.

LocoLabs has worked closely with manufacturing partners in the US and overseas. We understood the problems Bright Things would face while ramping up such a complex product under a tight schedule. We responded by developing a test fixture that allowed each of the major subsystems to be thoroughly tested as they were being built in China. Combining high-quality design and this test system, we achieved a manufacturing yield above similar mature products (>99%). LocoLabs developed the test fixture so that it could be monitored in real time over the Internet. This allowed the customer and the design team in Silicon Valley to monitor activity on the manufacturing floor in China. The LocoLabs test fixture not only tested the unit, it could load and modify software on the game cartridge while in the fixture. This allowed late gaming-software releases to be loaded into the cartridges at the last possible moment, providing game developers with the maximum window possible for development and refinement.

LocoLabs provided two key points of flexibility in the manufacturing process: The ability to test and qualify individual system parts as they were built, and the ability to remotely update final software very late in the process. These were key in achieving a fast and successful manufacturing ramp-up



- The idea John Kavanagh came up with while playing with his son launched a new company, a product line, and hundreds of thousands of game devices across the world. John came to LocoLabs with his idea and LocoLabs helped John realize that idea, bringing the Bubble to volume manufacturing in record time.

