

Johnson Fitness

Johnson Fitness uses Altium technology to fast track its newest line of fitness equipment.



“It’s the combination of powerful features in Altium’s unified environment that has allowed Johnson Fitness to shorten its product development cycles and create today’s most innovative fitness equipment.”

Lui Min,

Product development design engineer, Johnson Fitness

The need

When running on a treadmill, most people are probably focused on how long they have been running, how many calories they have burned or any number of personal fitness goals they have in mind. Certainly most wouldn’t be thinking about the complex electronics and motors running underneath the treadmill’s metallic finish and even less would think of the physics that went into making it all work. However, this isn’t the case for the electronics engineers at Johnson Fitness, one of the world’s leading developers of fitness equipment. It’s their job to make sure that it all runs very smoothly.

Recently the electronics designers at Johnson Fitness’ Research and Development department in Shanghai, China were asked to develop a new line of treadmills for its Matrix cardio series. The new treadmills needed to build on Johnson’s reputation for creating robust fitness vehicles that embody innovation and style.

The challenge

The Johnson Fitness research and development team consists of fifteen engineers and for that reason its design solution needed to handle multi-user requirements. Additionally, the project required a powerful board level design environment to ensure the quality and integrity of designs. The tool also needed to test the accuracy of circuit features, handle complex damping logic and optimize high speed PCB tracks, all while allowing for centralized library management.

Because of the unique physical structure of treadmills, Johnson Fitness needed to develop

its boards to meet tight mechanical design requirements. Co-ordinating the two disciplines can be fraught with costly and frustrating design revisions. In order to meet the mechanical design requirements and optimize board layout space, Johnson Fitness needed a system where mechanical and electronic design data can be shared freely. This would let electronics and mechanical designers collaborate on their designs and run assembly simulations that prevent costly design iterations.

The solution

By employing Altium’s unified electronic product development solution, the 15 Johnson Fitness engineers have access to all the features required for effective board level design, which include mixed signal circuit simulation and signal integrity analysis for high speed design. Additionally, electronics designers can take advantage of Altium Designer’s database library system. This lets the electronics engineers easily manage components, and allows them to store previous document libraries on the server so components from legacy designs can be easily reused.

Altium Designer is providing Johnson Fitness with the best available technology to overcome its MCAD ECAD design challenges. Using the 3D STEP export import feature, Johnson Fitness’ electronics designers can now integrate the once sequential and separate workflows of electronic and mechanical design. This speeds up the entire product development process, and allows the different teams to work more collaboratively and with fewer design revisions.



The results

Altium's solutions allowed Johnson Fitness designers to combine creativity with complete design control – the effect is evident within the final product design. For example, Johnson Fitness has been able to incorporate fuzzy control technologies into its motor controls, allowing the latest series of Matrix treadmills to be more adaptable to each user's fitness requirements. The designers were also able to add networking and broadcasting that allow users to add entertainment packages and integrate these with the console controls.

Additionally, Johnson Fitness has also been able to improve its design flow efficiency. Altium's unified environment allows electronics designers to maintain the design's integrity. By unifying this process and exploiting Altium's suite of layout and routing features, Johnson Fitness improved its development cycle by 20 per cent. While improved documentation and revision control meant the R&D and prototyping cycle was shortened from six months to only four.

Product information

The Matrix series of fitness treadmills are some of the most robust and technologically advanced in the industry. The treadmills are equipped with the latest in fitness and entertainment technology, making them attractive options for fitness enthusiasts.

Johnson Fitness (Shanghai) Co., Ltd manufactures a range of additional lines of fitness equipment, including its MATRIX, JOHNSON, VISION and HORIZON series.

Customer information

In 1990, Johnson Health Technology (Shanghai) Co., Ltd entered the fitness market and since then has maintained a high market share with its innovative product patents. The company researches, develops, and sells intelligent fitness solutions to more than 60 countries round the world, making it Asia's largest — and the world's fourth-largest — provider of fitness equipment.

For more information, visit:
www.johnsonfitness.com

Altium's solutions implemented in the fitness equipment industry

About Altium

Altium Limited (ASX:ALU) provides world-leading unified design solutions that break down the barriers to innovation, and help organisations easily harness the latest devices and technologies, to create their next generation of electronic products.

Altium's solutions are unique because they unify the separate processes of electronics design, all within a single electronics design environment, working off a single data model, which links all the aspects of electronics product design into one process.

Founded in 1985, Altium has headquarters in Sydney, Australia, sales offices in the United States, Europe, Japan, China, and resellers in all other major markets. For more information, please visit www.altium.com