

CUSTOMER SUCCESS STORY

KNOWLEDGE RESSOURCES - THE MOST DIFFICULT PROJECTS CAN BE THE MOST REWARDING.



There can be one thing said about contract work: no two projects are the same. It's an interesting situation to be in. It means the work is challenging and interesting, but it can also test the engineer and his tools.

Take Knowledge Resources as an example. It is an electronics design consultancy based in Basel, Switzerland. Last year, Knowledge Resources was commissioned to design a prototype of a network analyzer card with a PCI Express interface. As a design guideline the client provided a silicon vendor's reference design, a form factor description and a set of performance metrics (memory throughput, etc) as well as a wish list of possible assembly options. The client also provided one last requirement: it needed to be completed in just four weeks!

This was a particularly complex design. An analysis of the connectivity needs of the 1738 ball BGA FPGA revealed that the design could be implemented in 12 layers with the help of blind and buried microvias. The QDR memory architecture demanded that the 288 data lines must be length-matched to have a maximal skew of +/-20ps, while the eight-lane PCIe and the custom optical transceivers had to be routed to support bit-rates of 2.5Gb/s. This was going to be the design that tested Mike and his tools.

“ Because we use Altium Designer, we have been able to complete very complex designs in very short periods of time. For example, we were given a contract for a 12 layer PCB containing a Xilinx high-performance FPGA. The design came with a list of performance targets and a wish list of possible assembly options, but the hardest part was that it needed to be delivered in just four weeks! It was a tight design with a tight deadline. But with Altium Designer, we were able to deliver on schedule and above expectations. ”

Mike Stengle, Principal, Knowledge Resources

Never leave till tomorrow that which you can do today

Mike realized that with very little time available, he needed to be able to implement his ideas without constraint, and quickly. He also realized that he needed the latest tools to do this. Having been a long-time customer of Altium, Mike knew the benefits of keeping up-to-date with product updates. And the latest update would be the most important.

For example, the design's complex, high density layout made it difficult to achieve a length matched, impedance-controlled memory layout between the FPGA and memory interfaces. And in such cases, finding the right routing strategy for the design would usually require several iterations. However with Altium's support for automated pin-swapping, this time-consuming and error-prone process was vastly simplified.

Using this feature, Mike knew that changes between the FPGA and memory interface corrections would be synchronized. This is because Altium Designer's unified design environment means that traditionally separate processes now share the same data model. Whereas other tools commonly regard FPGA design as a separate process, Altium Designer brings these separate processes together, including FPGA development. This means Peter can experiment with programmable devices and explore ideas in a single application.

Altium's holistic approach also allows Mike to manage the increased design complexity introduced by FPGAs. It does this by raising the level of design abstraction, freeing Mike from dealing with the complexities of low level hardware architecture. These aspects are automated so that Mike can focus on the intelligence of the design, without the limitations of several separate data models, interfaces and design methodologies.

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Helping to improve design performance and maintain design integrity was Altium's differential pair routing capability. This feature helped Mike make sure that the coupling and impedance requirements were strictly followed, while Altium's design rules framework ensured that minimum distances were kept while the layout was pushed to the maximum density possible. And by being able to exploit these features, Mike could deliver on his contract's performance and metrics.

Fitting it all together

When the designs were complete, the team needed to collaborate with the client on its mechanical casings. This is where Altium's real-time ECAD-MCAD collaboration technology helped the team to remain on schedule.

"Altium's 3D MCAD-ECAD capabilities let us fit a custom optical transceiver block before it was ever made. The interpretation of flat 2D datasets would have been more time consuming and far less reliable than the Altium's easy-to-use collaboration technology," said Mike Stengle, Principal, Knowledge Resources.

This feature made it much simpler to bring the design together, enabling the team to produce a design on time and above performance expectations.

"We were able to deliver a completed design in 27 calendar days. The resulting prototype was a first-run success, where all sections of the design achieved or exceeded their performance goals. And the final product went into production with only minor adjustments. We would have never been able to do this without Altium Designer's latest updates and technologies."

About Knowledge Resources

Knowledge Resources is a design services company based in Basel, Switzerland. It has extensive experience in high speed layout methodology, FPGA design and RF circuits. Knowledge Resources uses its vast experience in its field to provide turnkey developments or assist with any aspect of an electronics design project.

ESTIMATED IMPROVEMENTS	USING PREVIOUS TOOL SET	USING ALTIUM DESIGNER
Time to layout PCBs	250 hours	150 hours
Time to do Revisions	30 hours	10 hours

ABOUT ALTIUM

Altium Limited (ASX:ALU) creates electronics design software. Altium's unified electronics design environment links all aspects of electronics product design in a single application that is priced as affordable as possible. This enables electronics designers to innovate, harness the latest devices and technologies, manage their projects across broad design 'ecosystems', and create connected, intelligent designs.

Founded in 1985, Altium has offices in San Diego, Sydney, Karlsruhe, Shanghai, Tokyo, Kiev, with value added resellers worldwide. For more information, visit www.altium.com. You can also follow and engage with Altium via [Facebook](#), [Twitter](#) and [YouTube](#).