



# ZTE Credits Intel® Technology for Fast Rise to the Top of China's Telecom Industry

## Case Summary

### Profiled Organization

ZTE Corporation is widely recognized as one of China's largest telecom equipment manufacturers and one of the largest local wireless service providers. The company's manufacturing division develops products in three categories: wireless platforms, networking equipment, and terminal/hand-held devices (e.g. cell phones).

### Story Focus

Competition is fierce in the telecom equipment industry, especially in China. Successful companies consistently deliver new products ahead of competitors, and sustain the advantage by combining innovative features with low prices. ZTE achieves this balance by using standards-based, modular platforms that help eliminate redundant development work—an important strategy for keeping costs low and speeding time to market. This case study focuses on ZTE's effort to gain efficiencies in the development of core platforms used in telecom infrastructure equipment, and explores how Intel® technology plays a key role.

## Background: The Dynamics of Telecom in China

The worldwide telecom equipment industry is populated by numerous, powerful companies. Competition is fierce and market share—dispersed among some of the world's strongest companies—is difficult to gain. Survival in this environment—let alone success—is difficult at best.

ZTE is one of the success stories. Gaining a leadership role in China's own highly competitive telecom equipment manufacturing industry has been a struggle for this innovative company. Company leaders say continued success requires ZTE to adhere to this mission:

*"Products and solutions provided by ZTE must be cost-effective. They must integrate new, more reliable technology which is able to protect customers' legacy investments as well as satisfy their future upgrade needs. In short, everything ZTE delivers must be better than the products and solutions provided by competitors."*

- Spokesperson, Universal Circuit Department, ZTE Corporation

This is no easy task. It takes both highly innovative minds and a cooperative business environment to consistently deliver the products and solutions that can beat the competition.

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Spokesperson  
Universal Circuit Department  
ZTE Corporation

To this end, ZTE has developed essential organizational and cultural efficiencies that contribute to this success. For example, the Universal Circuit Department of ZTE Kangxun was created to serve ZTE's five business groups and to provide hardware platform selection and related technical R&D support to other departments. When ZTE launches a new product, the Universal Circuit Department selects hardware platforms capable of meeting the product's requirements.

## Engineering Challenges

The design of microprocessor platforms (MPs) is one of ZTE's most important businesses. MPs are network control boards widely used to perform functions such as network switching in advanced telecommunication networks based on standards such as WCDMA, CDMA 1X (CDMA 2000), and switched web. A spokesperson for the Universal Circuit Department, ZTE Corporation stresses that, "In MP design, the selection of the main-controller processor is the key issue. Current network demand multiplies quickly, thus the more powerful the performance of the processor, the better."

ZTE Corporation was an early adopter of printed circuit board (PCB) design and simulation technology for developing MPs and other integrated circuit boards. These designs were complicated and featured long product launch cycles, making it difficult to reach the marketplace ahead of competitors.

These initial electronic designs targeted the integrated system level, however the entire project contained both hardware and software components. This presented new challenges to electronic engineers, first in dividing the functions of system software and hardware in initial designs, and second in rapidly designing PCBs with high performance and reliability. Because software development must follow hardware design, fast hardware design is the key to quicker overall design cycles.

Early MP products from both ZTE and others were often developed entirely from scratch. Many telecom equipment manufacturers researched and developed products in isolation, leading to long development times and expensive products. Newcomers wishing to build such exclusive technology plat-

forms faced high barriers to entry, and their products were usually unable to rival those from global competitors.

## New Strategies for Success

As competition in the telecom sector increased, ZTE sought ways to increase the pace of both hardware and software development. One important decision proved highly successful: switching to off-the-shelf components, including Intel® microprocessors, for use in MPs and other board designs. "Using off-the-shelf components has brought vast improvement to ZTE's MP design, enabling more rapid creation of smaller products with better performance," explains the ZTE spokesperson.

ZTE isn't the only company to see the value of off-the-shelf designs. The widespread availability of what ZTE calls "standard" components is leading to the development of modular platforms that easily integrate into a plethora of solutions. This in turn is fueling innovation industry wide.

"Modular solutions have made designers more willing to adopt standards-based components from third-party technology leaders such as Intel," says the Universal Circuit Department spokesperson. "This trend is accelerating product development cycles and greatly increasing the overall value of finished products, with features like lower energy consumption, smaller size and higher performance."

## Solution Details

Once ZTE decided to use off-the-shelf technology for development of its core MPs, they evaluated processors from multiple companies, including Intel. However, none of the other third-party processors were able to match the performance of the Intel products.

According to the official spokesperson in ZTE's Universal Circuit Department, ZTE chose Intel® technology for several reasons. Good performance was paramount. "We use the Intel® Pentium® M processor for our new generation of microprocessor platforms because its performance indicators meet the requirements of our 3G, CDMA, network and communications, and other product lines. It also satisfies the two most important requirements for telecom service providers. First, the Intel Pentium M processor improves performance for a variety of ZTE network control boards handling functions such as signaling, call control, resource management, OMP (Operating Maintenance Procedure), SPCF and more.

**"Intel® technology improves  
the performance and value of  
ZTE products."**

**Spokesperson  
Universal Circuit Department  
ZTE Corporation**

Second, it unifies network administration and maintenance, thus cutting operation and hosting costs, reducing the number of data center servers, and saving data center space.”

This second capability is particularly exciting for ZTE customers. Unification of network administration usually requires running commercial third-party network administration software, which often runs in a Windows\* or Unix\* operating system. At present, telecom operators generally use third-party desktop servers for these systems. But these servers are comparatively large and take up valuable data center space, and server costs remain high. ZTE Corporation developed its MP using the Intel Pentium M processor with Windows NT as the operating system, and inserted the MP into the case for use in background or billing servers. This greatly lowered cost while facilitating maintenance and network management and catering to the needs of telecom operators.

Such embedded solutions also lower energy consumption, a major driver in equipment selection. With support from Intel’s software team, ZTE was also given a flexible choice of an operating system and applications.

Development of low-level software, such as BIOS, OS and device drivers, is also important for integrated solutions. For products that require such software, ZTE Corporation relied on Intel’s R&D strength, embedded firmware expertise, and embedded application support. By avoiding the need to license third-party software or engage in complex customization, reliance on Intel expertise in this area helped speed development and reduce R&D costs. Because Intel provides a range of software, tools and support, ZTE can launch MP products superior to those of its competitors as well as satisfy customer demands at a lower price.

The spokesperson from ZTE’s Universal Circuit Department also explains that the Intel Pentium M processor also supports individual ZTE business divisions nicely. “The Pentium® M processor is developed for a number of communications protocols, which makes it ready for development into devices that work with a variety of networks, including CDMA and 3G networks. The versatility and readiness of the Intel processor played a critical role in upgrading ZTE’s products in all of these areas.”

Going forward, ZTE sees long-term gain to using the Intel Pentium M processor and other chips on the Intel roadmap.

## **“The versatility and readiness of the Intel® processor played a critical role in upgrading ZTE’s products.”**

**Spokesperson  
Universal Circuit Department  
ZTE Corporation**

“During design, we discussed the roadmap for the Intel® Pentium® M processor with Intel. Based on those conversations, we foresee that the Intel Pentium M processor will meet the main controller requirements of our strategic products for several years to come. As the technology is advancing continuously, ZTE products will be upgraded much more regularly.”

## **The Value of Choosing Intel**

Commenting on cooperation with Intel, the ZTE spokesperson said that Intel’s cutting-edge technology, high performance and the reliability of its CPUs help ZTE meet demand for high-end products. He also noted that Intel’s comprehensive technical support ensures that ZTE projects run smoothly.

ZTE’s Universal Circuit Department also agrees that Intel services were “first rate”. Like it does for many customers, “Intel created a special team to service the ZTE Corporation. This team regularly visits ZTE to conduct technical exchanges and provide support,” explains the spokesperson from the Universal Circuit Department, ZTE Corporation. “ZTE Corporation also maintains a special team to study Intel technology so that it can be easily optimized and rapidly integrated into ZTE products.” The spokesperson notes that this cooperation with Intel is integral to ZTE’s operations.

ZTE credits the application of Intel technologies and solutions as a key factor in the success of ZTE products. In fact, the Universal Circuit Department holds that “products designed on the Intel® Pentium® M processor are strategically significant” to ZTE’s business success. In short, “Intel technology improves the performance and value of ZTE products.”

ZTE even goes so far to say that Intel’s technology leadership is important for all of China’s telecom industry. “The benefits of using Intel technology are not ours alone. Anyone can experience these benefits,” claims the Universal Circuit Department spokesperson.

## Conclusion

There are two important lessons to be gained by studying the relationship between ZTE and Intel:

- First is the decision by ZTE to discard old, proprietary design strategies and adopt the standards-based, modular approach to product development. "Incorporating standardized processors into our products helps ZTE achieve lower costs and faster development times, thereby improving our position in this competitive industry," explains the spokesperson from ZTE's Universal Circuit Department. "Intel, of course, is the leading supplier of off-the-shelf processors, and their performance advantage works to our advantage."
- Second is the cooperation between Intel and ZTE during design and development. "Working closely with Intel has enabled ZTE to provide the most advanced products and solutions to the telecommunications industry. It has also enabled ZTE's core products to better compete in the global market."

This case illustrates only one small aspect of the ten-year cooperation between Intel and ZTE, and many more products in the ZTE Corporation reflect this successful relationship.

## For more information

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### About ZTE Corporation

<http://www.zte.com.cn:8080/English/index.jsp>

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