

Can Start-Up Device Makers Tap Into IoT?

They can with simulation aided design solutions says Tatu Karvinen, Managing Director of Finnish Insight Engineering firm Convergentia

OULU, FINLAND, August 30, 2018 /EINPresswire.com/ -- According to all technology forecasters, tens of billions of devices will be connected through wireless networks globally in the not too distant future. Digitalization has ignited a proliferation of connected devices in all sectors of life and business and this will translate into growing revenues for device makers.

In the past, only a handful of established device makers were able to create blockbuster gadgets for world markets. But that's changing. With the advent of IoT, hundreds of small start-ups are trying to cash-in and mimic the big manufacturers and bring new devices to global markets at a fraction of the price. Crowdfunding platforms such as Kickstarter are flooded by these projects.

But, competition is tough and making a connected consumer product for global distribution is not easy. So, how can device makers speed up time to market without jeopardizing the quality and user-experience of their products?

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Designing a connected product requires specialist expertise in antenna, EMC, mechanics and thermal design, and calls for time-consuming prototyping and testing. Let's delve deeper.

Antenna: Nowadays, many devices feature metal casings, which is a very challenging operating environment for an antenna. Antennas are found in increasingly smaller devices and in devices held near or inside human body. Hearing aids, smart watches sensors, smart rings are typical examples.

The small size of the device and the proximity of the human body put special high demands on the concept of an antenna. Antennas require high efficiency and design for high-frequency 5G devices is really challenging. Propagation, range and carrying capabilities at high frequency are lower and that poses a profound demand on manufacturers. In antenna design, requirements



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vary by country and region and compliance with official requirements requires special expertise in design.

EMC: the operating environment for smart devices is becoming more demanding as the volume (quantities) is growing. Devices should not interfere with signals from other devices or interfere with others. Such reliability is particularly important in health and military environments, but also in standard mobile devices for the consumer. A touch screen often causes interference with the receiver.

Designing effective EMC solutions has traditionally been hit and miss and rely on hope that it will somehow work. Through simulations, the design process can be undertaken in a precise and controlled way. Typically, a device maker understands its EMC design needs only after the build phase when the problem is detected. With simulations and lab measurements, the problem can be analyzed early and accurately.

Thermal: more and more power is required from devices, leading to more powerful batteries and processors. LED displays tend to heat up especially in handheld devices, and this often causes problems with user safety and comfort. There is also a set of specifications for the warming of the equipment that manufacturers have to conform to in order to get a product on the market. Of course, it is far more effective to design a device according to a specification from the beginning than to hope that an already made design conforms to a specification.

Simulations can be used to find at an early stage what solution will work and what will not. In most cases, simulations are applied for corrections to the existing design to match the specification. Also, the power consumption of 5G base stations is really high, which also requires accurate thermal design to prevent cooling problems.

Mechanics: Equipment transported can carry more than before, meaning they have to endure a wide variety of applications in environments. For example, the wearable sector's growth is reflected in this trend. Various devices must withstand body moisture, under water use and other challenging conditions. For example, simulation of drop, vibration and seal tests can be used to avoid large and costly prototype cycles that are often needed to make durable products. Assembly simulations such be used to avoid assembly problems.

Abstracts

Start-up equipment manufacturers often take a reverse approach to device design. It's not unusual for them to take a cheap Chinese bulk antenna only to discover after extensive and costly prototype rounds and testing that it does not work at all.

This "instant" engineering approach often proves more expensive than if the antenna was custom designed to fit the device right from the start. The same can be said for every other design area. Early phase engineering should be taken into account first in the product development process. It will save both time and money. Simulations and virtual prototypes can also be used to effectively compare different concepts such as component changes.

Convergentia is showcasing its simulation aided design solutions at the Mobile World Congress Americas in Los Angeles in September 12-14th at the Finland Pavilion (Stand 1360). Other telecom, video, cybersecurity and IoT companies showcasing at the Finland Pavilion are Bcaster, Cloudstreet, Creanord, Exomi, F-Secure, Kaitotek, Sitowise and Tosibox.

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About the Author

Tatu Karvinen is Managing Director of insight engineering firm Convergentia. Before founding Convergentia, he worked for Nokia in various engineering positions. Karvinen holds a degree of Master of Science from the University of Oulu.

About Convergentia

Convergentia provides simulation-aided design solutions to products where high quality, low cost, or predictable time-to-market are of great importance. Company's experienced and internationally recognized antenna, EMC, mechanics, and thermal design teams can cover the most critical parts of a large variety of products. Numerous customers worldwide in a wide range of industries have already benefited from the virtual prototyping services of Convergentia's "virtual build factory", the first of its kind in the world. <http://www.convergentia.com/>

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