Tobias Helbig,
is responsible for Innovation
Management within the
CTO organization at NXP
in Hamburg (Germany).

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Open Source RISC-V Systems as an Opportunity for Europe

When plans were announced in September 2020 for NVIDIA to acquire British CPU developer Arm, the chip industry was alarmed. The market is currently dominated by two processor architectures, Arm and x86. While x86 is used predominantly for Intel and AMD processors in PCs, servers or game consoles, Arm is mainly used for very energy-efficient products such as smartphones or embedded systems in the automotive and industrial sectors. Without Arm's licenses, many semiconductor companies would lose their competitive edge. With the possible purchase by NVIDIA, semiconductor producers were suddenly confronted with the danger that a dominant competitor could dictate prices to them at will.

Even though the deal ultimately fell through, manufacturers were warned and looked for alternatives. The most promising was RISC-V, an architecture for processors developed at the University of California, Berkeley in 2015. The beauty of RISC-V is that it's an open-source system that anyone can use and modify without paying licensing fees. This saves costs and increases the usability scope for developing processors. Additionally, it lowers the entry bar, as RISC-V can enable smaller market players to develop processors for their specific needs. The automotive industry, for example, could use RISC-V chips for vehicle systems such as lidar and radar. They are also well suited for safety-critical applications in vehicles, as individual prefabricated blocks can be certified in accordance with automotive standards like ASIL-D.

At the moment, it is clear that RISC-V is still many years behind the established architectures in terms of development. Hardware and software development is complex, and the risk of infringing patents is high. Open source always includes several risks. However, more and more companies and institutions are now jumping on the bandwagon. Much like Linux 30 years ago, 2023 seems to be shaping up to be a watershed year. Google has announced that Android will support RISC-V in the future. Additionally, several industry alliances of technology groups and chip manufacturers, including NXP - have announced that they will promote the development of an ecosystem around RISC-V. Even the EU is backing RISC-V to strengthen Europe's technological independence, for example with the European Processor Initiative (EPI). With initiatives such as the EPI, the gap between RISC-V and the dominant processor architectures, Arm and x86, will quickly close.

Using this industry momentum, we, together with other well-known competitors, plan to establish a company that will initally focus on the development of RISC-V solutions for the automotive industry. Of course, since it is in its infantry, there is still a lack of comprehensive software support, powerful processors, and even support for other major technology groups and platforms, but the foundations for success have been set.