

### The executive team's message



*“IoT and embedded are fast moving markets, especially on the software side which is greatly growing thanks to its large community. It’s not always easy for you, innovators, to **step back, analyze, and get a holistic understanding to help drive good decisions.**”*

*To that end, Witekio management team have decided to create this **private, exclusive and unique format to give you the insight from the field and enable you to connect the dots and decode what is behind the hype in just 5 minutes.** In this letter you’ll find emerging technologies, information about specific market drops and/or growth spurts, signals we see in the market, learnings from our latest projects and our data analysis - all extracted from the unique Witekio team experience.*

*We hope you’ll enjoy it.”*

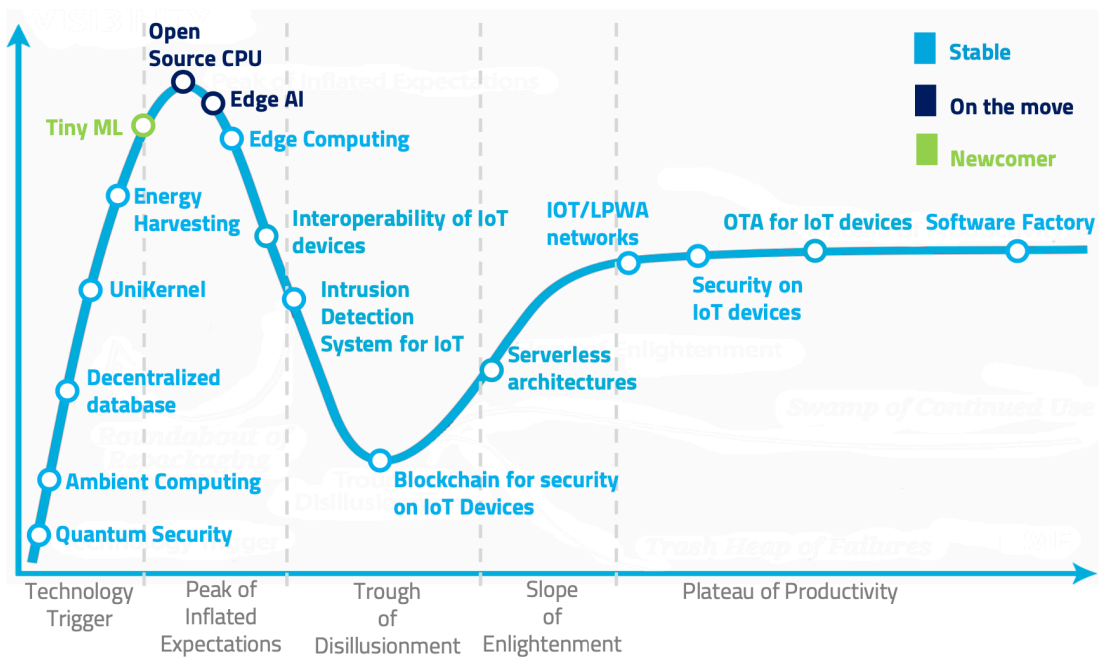
*Samir, Sebastien, and Yannick*

### What is happening in the software world?

- ✓ The French **Car manufacturer Renault has been selecting Lora technology** in all their factories for an optimized supply chain management.
- ✓ **Nordic Semiconductor expands into Wi-Fi** by acquiring the entire Wi-Fi development team, core Wi-Fi expertise, and Wi-Fi IP tech assets of Imagination Technologies Group. Nordic will be one of the few companies to offer all three of the world’s most popular wireless IoT technologies: Bluetooth, Wi-Fi, and cellular IoT (both LTE-M and NB-IoT versions)
- ✓ **Tesla Model X hacked with \$195 Raspberry Pi based board.** Hackers have used a breach in software update mechanism to take full control on the BLE interface. As a result of the hack, Tesla has released an over-the-air software update to mitigate these issues.
- ✓ **AMD to Acquire Xilinx**, offering them key assets to penetrate ARM based embedded applications, get the flexible FPGA technology and continue to expand their 5G footprint.
- ✓ **Edge AI application continue to push** for initiative such as TinyML to reduce the AI footprint at the edge. AI devs created a lean, mean, GPT-3-beating machine that uses 99.9% fewer parameters.
- ✓ **Nvidia breakthrough** enables AI training with limited datasets, researchers reduced the number of images used to **train AI models by 10 to 20 times** while still achieving excellent results.



# Our updated software hype cycle curve



## TINY ML, a rising star

**Tiny ML** is the intersection between machine learning and embedded ultra low power systems. It all started in 2015 with Google trying to wake up the phones with their famous “Hey, Google”. Since they could not use the main microprocessor and send the data to the cloud (a phone is in sleep mode and therefore the microprocessor is in low power mode and needs to be awakened before it can do anything) they needed to add a microcontroller or DSP to listen to user’s voice, process it locally and decide whether or not to wake up the device. Of course, they also wanted to keep the price of their product as low as possible which kicked off the development of a technology that could run small AI models on cheap hardware. Fast forward a couple of years and this technology is called TensorFlow Lite and can be used to run AI models on most common microcontrollers and DSPs.

## Open Source CPU at the top of expectations

Open source CPU technology as RISC-V can be considered as the Linux of the chip world, and can seriously change the rules on the embedded market as performance is getting closer to the leading ARM technology. RISC-V is a free and open ISA enabling a new era of processor innovation through open standard collaboration. Born in academia and research, RISC-V ISA delivers a new level of free, extensible software and hardware freedom on architecture, paving the way for the next 50 years of computing design and innovation.

## Edge AI heading toward the trough of disillusionment?

Edge AI means that AI algorithms are processed locally on a hardware device. The algorithms are using data (sensor data or signals) that are created on the device. A device using Edge AI does not need to be connected in order to work properly, it can process data and take decisions independently without a connection. In order to use Edge AI, you need a device comprising a microprocessor and sensors.

## Our CTO analysis :



### How the prospect of 5G is threatening Sigfox



Sigfox has been trying to take over the LPWAN market since its creation in 2009, what they would call the “0G” network. They were already racing against the clock to be prominent enough to be the solution for IoT connectivity before technologies like LTEM/IoT NB and later 5G became widely available. But between failing to deploy their network in the USA and not reaching a critical mass of customers, they reached a point where their business model would need a pivot.

Their first step was to sell their different networks to refocus on services progressively. It is even more evident after their recent CEO announcement that SigFox will focus on data management and sell all their existing network. What does it mean for low-end IoT applications? Is still SigFox the right technology to bet on right now?

The answer is probably no; for low power requirements, it is better to recommend Lora technology. Lora was the “outsider,” but since the technology was picked up by Amazon and integrated into all of their IoT sidewalk devices, it completely reshuffled the deck (<https://www.semtech.com/company/press/semtech-and-amazon-collaborate-to-provide-low-power-connectivity-for-consumer-applications-on-amazon-sidewalk>).

For use cases that require an existing extended network, it is better to rely on LTEM or IoT-NB (depending on your country) which is supported by big telco providers and will be extended in the future to 5G. Meanwhile, only the future will tell us if Sigfox will successfully operate its business model pivot on IoT data management.

## Dive Deeper

RISC-V, the Linux of the chip world: <https://www.zdnet.com/article/risc-v-the-linux-of-the-chip-world-is-starting-to-produce-technological-breakthroughs/>

TinyML can supercharge AI on MCU : <https://witekio.com/tinyml-on-mcu/>

Is the hype around edge computing justified? <https://witekio.com/edge-computing-edge-iot-why-it-matters/>

Nvidia breakthrough enables AI training with limited datasets: <https://siliconangle.com/2020/12/07/nvidia-breakthrough-enables-ai-training-limited-datasets/>

How Will 5G Impact IoT Devices? <https://witekio.com/how-will-5g-impact-iot-devices/>

Sigfox sells German network to Cube Infrastructure Managers: <https://www.mwee.com/news/sigfox-sells-german-network-cube-infrastructure-managers>