Firmware Engineers Need Formal Training, Just Like their Hardware and Software Counterparts

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Interesting fact: Most of today's successful firmware engineers, as many as 80% according to a recent poll, are actually electrical engineers that received on-the-job training. Is that the best way to educate this vital segment of our industry? **I think not.**

Firmware, which is the intersection between the electronics and the software realms (or user interfaces), is vital for a system's operation and essential in advancing the Age of IoT. It serves as a translator so that the software can understand the electronics in a way that it needs to, and then vice versa.

Sounds pretty important, doesn't it? I assure you, it's crucial. But if this is such an integral part of embedded system design, why don't more prominent universities offer a program that specializes in firmware engineering? I'm aware that starting up a new program is risky, and universities are businesses too, but we need to start somewhere.

One important aspect is that, unlike software engineering, it's quite difficult to enter an engineering firm as a firmware engineer. Why? Because knowledge is required of the specific hardware that's in use, as well as the software that's to be coupled with that hardware to create the end-user experience. Each case is so specific, it's a difficult program for a university to put together and maintain the "well roundedness" that they desire in their graduates.

Start With a Hardware Engineer, Not a Software Engineer

I've said on multiple occasions that, even though there are some similarities between firmware and software, we're far better off converting a hardware engineer into a firmware engineer than taking someone from the software side.

With all due respect to software engineers, what they do doesn't require understanding electrical engineering. Nor does it require having "the knack" of engineering as a whole. You can't design electronics without a lot of time and educational materials. So starting out is a challenge, a very big challenge, if you are coming from the software side of the spectrum in your firmware mastery.

That's not to say that hardware engineers are smarter than their software counterparts. It's just saying that the **knowledge base must be broader**. And a firmware engineer needs to understand the basic concepts of **both the hardware and the software.** Hence, knowing the hardware aspects first will make for a quicker learn.

Note that these comments are not off-the-cuff. They come from decades of experience, first learning how to be a great firmware engineer, then training those that went on the be great firmware engineers themselves.

It'll Take Actions, Not Just Words

Having said that, we're aware that just putting curriculums and degrees out there doesn't automatically produce more firmware engineers. We need to very actively encourage people to seek careers in firmware. Careers in firmware should be embraced, encouraged, and communicated through leadership and collaboration. And to do that, we need a coordinated effort among universities, government agencies, industry, both commercial vendors and consortia, and the media.

It's not likely that any one entity can have the impact that's needed. However, if we can get a groundswell from all four groups mentioned here, a lot of progress is sure to be made.

We firmly believe here at USA Firmware that we are doing our part. In fact, we are working to build a sub-community of people who are as passionate about **making firmware visible** as we are. The intent is that we will provide any and all parties with information, presentations, content, and so on. The hope is that participants will go to their communities, their universities, government agencies and their companies, and discuss the importance of firmware.

Next would be to educate and display the level of urgency that is required, both in industry and academia by recognizing that **our future lies in connected devices, whose core lies in firmware.** We always say that firmware is the lifeblood or backbone of the IoT. We just need more voices to help us get that message out.

Get Involved!

To that end, USA Firmware has a **Call to Action** for all those that want to get involved. Here is my ask: **help me, help us, help our community** come together and consistently explain why firmware matters. If we align and educate from the same viewpoint, we can turn firmware from invisible to visible and give the discipline the respect it deserves in this era of mass device and IoT adoption. Only by acting in unity can we educate the media and the general public.

To participate: On your mobile device, text yesfirmware to 877-379-4135 and join the movement to make firmware visible.