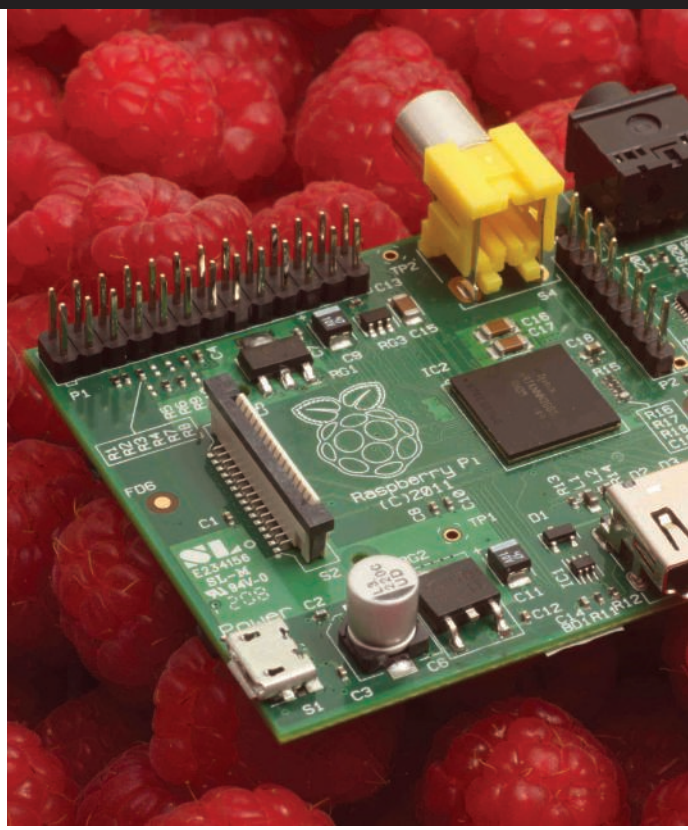
Dev kits for the masses



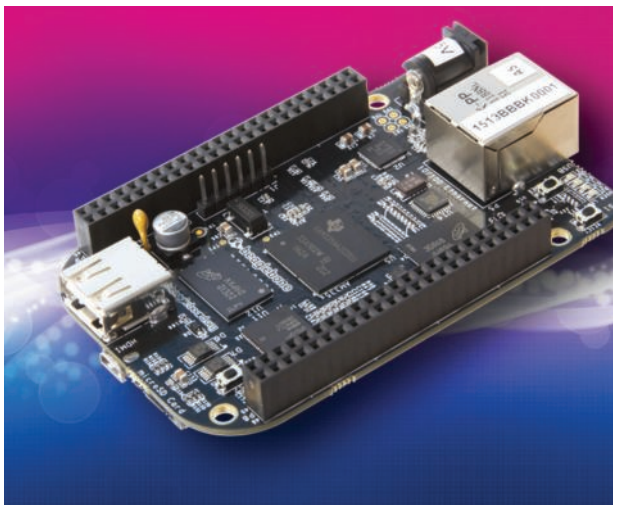
Raspberry Pi and Arduino are not only achieving great success in education, they are also having a profound and beneficial impact for professional electronics designers. **Tim Fryer** spoke to two of the distributors who are providing sales and support in this new environment

Raspberry Pi has been a phenomenon. As it celebrates its second birthday this month, it was hoped that it would have sold 2million units. In fact it passed this milestone back in October 2013. While Arduino can't quite match the unit sales, it does have more hardware options and flexibility.

There is no question that, in terms of opening up the possibilities of electronics design to children and students, these platforms have been hugely successful. Encouraging the next generation to engage with electronics is obviously of benefit to the electronics sector enough, but it has become clear that these platforms are directly of use for electronics designers.

David Adams, senior director for technology development at Premier Farnell, described the scenario: "What we have seen with prices coming down with the Raspberry Pi and Arduino is new environments and lower cost points. So it's not just hobbyists, schools and universities using them, we are seeing engineering folks that are working with their kids at night and then realising what it can do and taking it to work in the morning to build initial prototypes at lower cost than we could have done in the past."

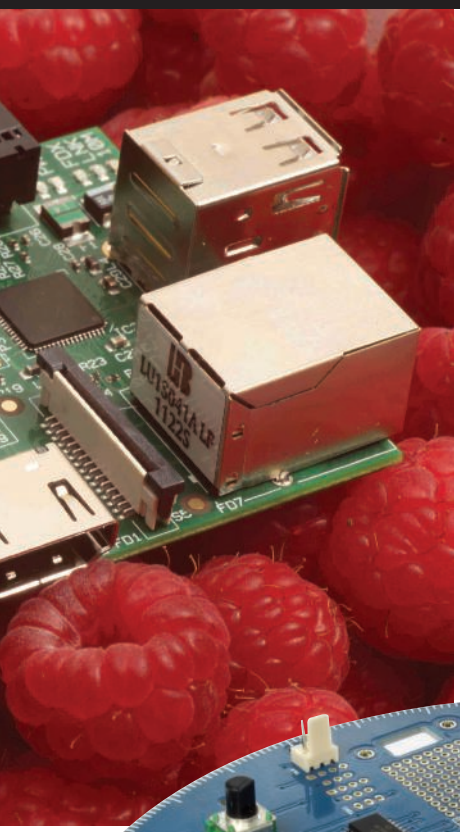
It is a trend that RS Components is seeing as well, as Lorna Finch, category marketing manager for Raspberry Pi, pointed out. "We have seen this with Raspberry Pi. Still the largest proportion of that business is going into the hobbyist and enthusiast sector. But, within the last year, a significant and growing area of the business has come from that B2B, commercial environment. A lot of the applications seem to be production line control, controlling a screen based on graphic capability, or a lot of sensor control applications – environmental monitoring and control."



While Raspberry Pi (top) has given the market momentum, platforms such as the BeagleBone Black (below) really cross the divide between business and consumers

The projects which Finch describes are those using the Raspberry Pi as a module embedded in an end application, rather than as a development platform, and this exposes both its strengths and weaknesses in the engineering environment, especially when comparing it to other platforms.

Simon Duggleby is RS Components' category marketing manager for semiconductors. He commented: "The Raspberry Pi is fantastic for software, but in terms of expanding hardware for your own board, your own design, you are restricted. On the flip side of that, you have got the Arduino, where the processor is available and the schematics are open source and therefore available. So you can prototype using the boards themselves, use the code, do whatever you want with it and then turn it into your own production board with the silicon available. I guess the virtue of the Arduino is that you can use it as a true route to your own embedded development application, whereas Raspberry Pi is fantastic at getting up and running and doing the software side of that within minutes using Python. You can create your own Internet of Things application within minutes – there is a longer

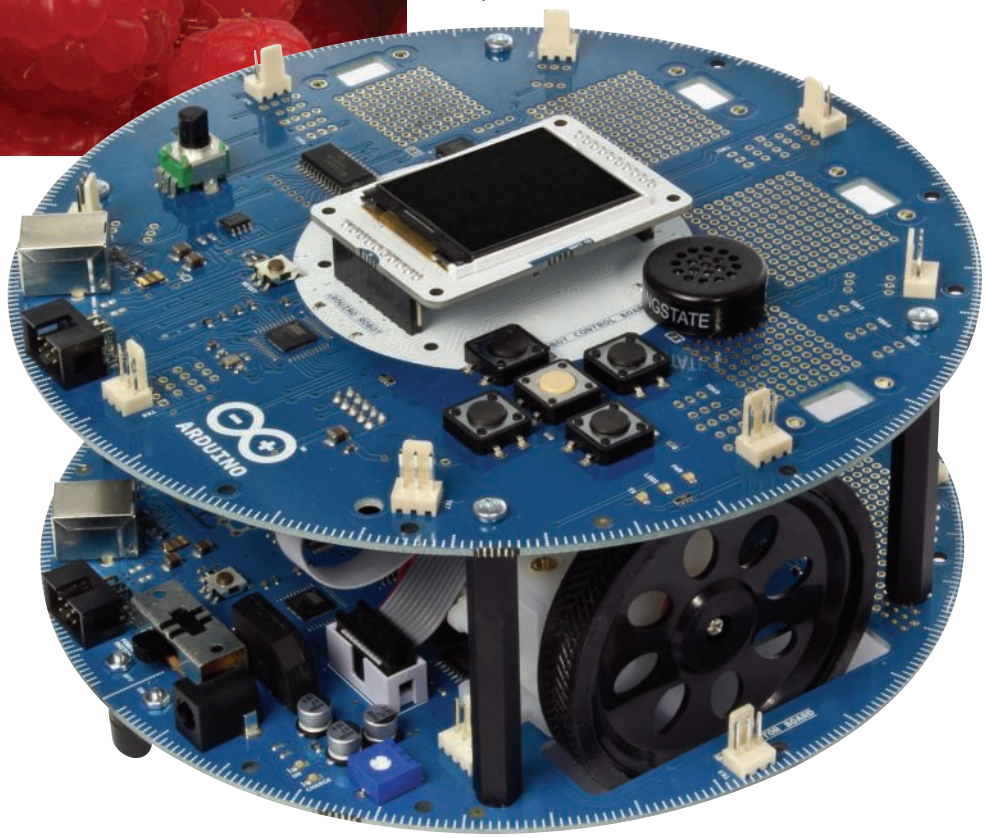


social media and beaglebone.org, combined with a dramatic reduction in cost, has bought this engineering tool down into the hobbyist arena, rather than the other way round.

Adams said: "In my time at Motorola (Freescale), dev kit cost typically ranged from $500 to $2000. What we have seen happen over the past five years – and particularly the past two years – is that semiconductor companies like Freescale and TI have decided to put a low end board out at a sub $100 price point and have found greater adoption. If the customer needs more

"What you have is an environment that gets you to the low end embedded space of building electronics."

David Adams



While the Arduino Robot kit may not be the cheapest of the many Arduino variations, it is the first to put your design on wheels!

learning curve to get to that point with the others. Each one definitely has its own place."

Mentioned in the same breath these days are other platforms that are arriving in the same space as Arduino and Raspberry Pi, but from a different direction. The most notable of these is the BeagleBone Black. In its initial form, BeagleBone, it was very much a Texas Instruments B2B development board. But the building of a community around it, fuelled by features, they can upscale to the larger dev kits."

BeagleBone Black now costs around £32 and there are plenty more from the other silicon vendors. Duggleby picked out one in particular. "I think Silicon Labs has done a good job recently with the Zero Gecko starter kit."

Historically, Silicon Laboratories targeted high end customers, rather than the broad market, but the acquisition of Energy Micro has heralded a change of focus. "They have come in with a series of really good starter kits supported by its Simplicity Studio product, which makes it easy to pick up the Silicon Labs microcontroller and get developing," Duggleby added. "I think it has put the customer at the heart of design again. By making tools accessible, it makes it easier for people to access to electronics, to coding. I think the movement around Raspberry Pi has given it the PR that it needs. It is good to see that coding has come on the syllabus for GCSEs, it all just adds fuel to the fire. I think that, over the next ten years, coding will be a standard skill for a large number of the UK's population."

Making inroads?

So have the educational platforms made a real inroad into the design space? Adams admitted: "I can tell you I have worked with design companies and engineers who are using Arduino shields to prototype their next end product because of the price point of these shields – again crossing over from education and hobbyist directly into true design engineering."

But it would appear that possibly the greatest impact of these platforms – certainly in terms of proof of concept, prototyping and software development projects – is their capability. So capable, in fact, that designers are now much less willing to pay several hundred pounds for dev kits when they can do much of the initial work on a Pi or Arduino for much less than £50. The consequence has been that all the silicon vendors are introducing entry level starter boards that come in at the same price points as 'hobbyist' platforms, therefore opening up access to silicon to all.

Having started out coding 25 years ago, Adams confesses that he is jealous of the opportunity that young designers now have. "Access to this is revolutionary, it has never been done before and it is just starting, it will be interesting to see how this wave impacts on overall engineering design, digital design and software writing."