Make or buy?

IP reuse comes down to a basic question. By **Graham Pitcher.**

If a company is supplying products to fast moving markets, then getting those products to market on schedule is critical; miss the 'window' and the consequences are unpleasant.

But products are getting more complex, so hitting those windows is getting harder, particularly if you start from a clean sheet of paper. So a sector of the industry has, for the last few years, been championing IP reuse.

The approach has many attractions; you're not reinventing the wheel for one. But the market hasn't developed in the way many had hoped, although some sectors – SoC design, for example – are more advanced. So what do some experts in the field believe are the pressures forcing OEMs to source IP?

"Companies can't provide enough resources to develop all the IP they require in house," said Ralph von Vignau, senior director, Infrastructure and Standards, for Philips Semiconductors. "Today, products that are ahead of the curve in meeting emerging demand will be the winners. Clearly, time to market with the required functionality is paramount."

Warren Savage, president and ceo of IP-Extreme, sees three main forces. "Firstly, the capacity of chips is doubling every couple years. Secondly, there are insufficient engineering resources to develop all the cores needed to fill a modern chip, which gives rise to the third reason; a need to focus scant engineering resources on new, differentiated features."

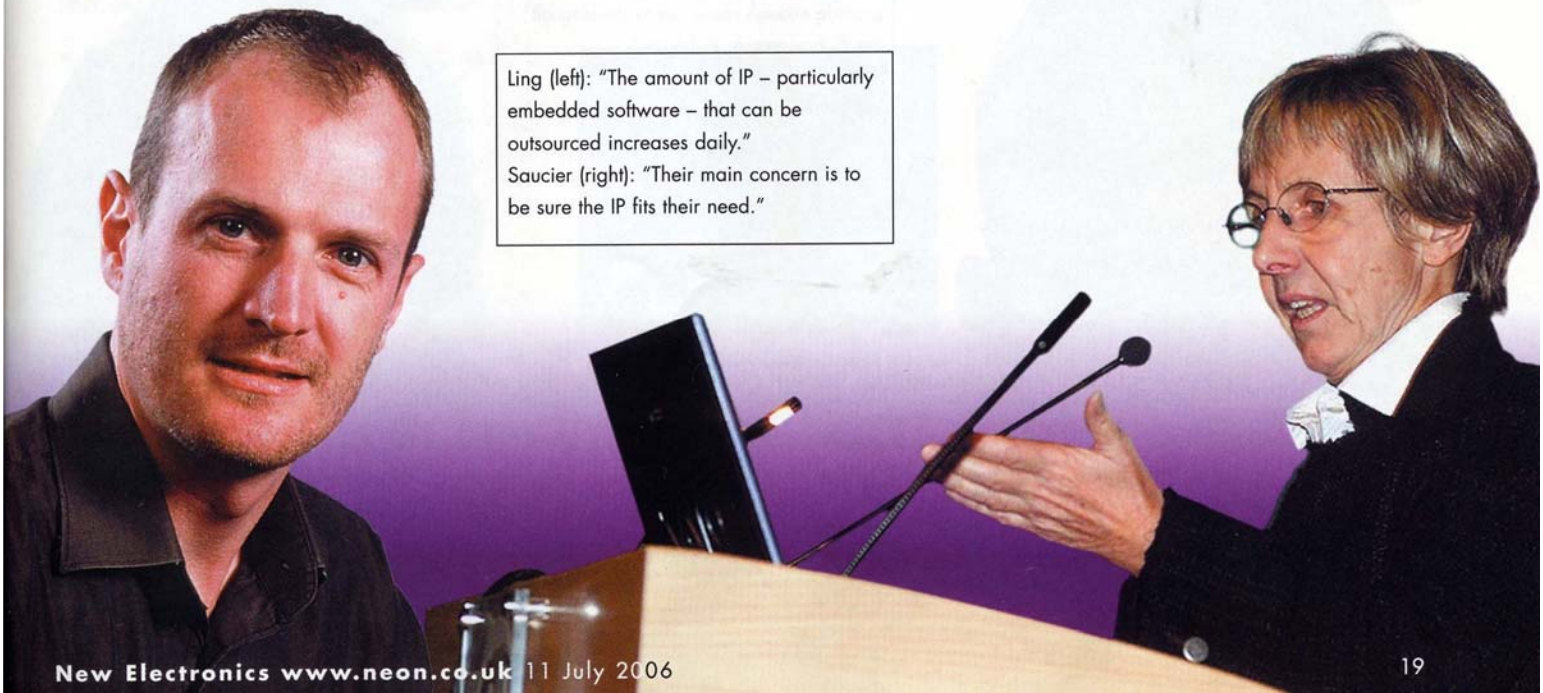
What are the benefits of sourcing IP? Philip Ling, technical director of Proven Software Solutions, said: "The cost of design is rising as complexity increases. The effort involved in learning new protocols or implementing standard, but unfamiliar, features is becoming harder to budget for. At the same time, the value that standard features add to an end product is dropping. Licensing IP that implements these features means the licensee needn't invest time in learning a function that doesn't necessarily add a comparable amount to the end value of the product."

von Vignau agreed: "The benefit lies in focusing one's own resources on the differentiating factors, rather than on work that can be done by anyone else. Flexibility of choice and cost of ownership can be better managed as well."

One of the reasons why IP reuse and trading may not have as high a profile as imagined is the supply chain. We asked our experts who was supplying IP.

Savage says IP is coming primarily from companies focused entirely on selling IP. "But there are also foundries, who focus on smaller, process specific IP building blocks, and eda companies, who use IP to augment the value of their tools. Even semiconductor companies are beginning to offer their IP assets to third parties through companies like mine."

Ling noted: "Anyone who develops embedded software could be an IP supplier. Using our technologies and method-



Ling (left): "The amount of IP – particularly embedded software – that can be outsourced increases daily."
Saucier (right): "Their main concern is to be sure the IP fits their need."

ologies, we can audit and 'productise' embedded software, giving it a quality stamp and realistic value. We can then provide that software at a cost significantly lower than that of developing it in house."

Asked what proportion of designs contained some sourced IP, von Vignau commented: "Very few, if any, designs do not include sourced IP. Up to 80% of the standard IP functions in today's SoCs could be sourced. But, in practical terms, growth will not go much beyond 85% and this could be reached within five years."

Savage added: "A survey in 2005 found 10% of IP was outsourced in 1998 and 60% in 2005, so it has already grown."

But what about wider use; embedded systems, for example? Ling finds that a harder question to answer. "It's becoming more common to use an outsourced operating system," he ventured, "and those OS are supported by an 'ecosystem'. We believe this could also support OEMs who have developed proprietary software to run alongside those OS."

When you're buying any product, the phrase '*caveat emptor*' is appropriate – and some would say entirely applicable to IP sourcing. What are our expert's customers worried about? Gabriele Saucier, ceo of Design & Reuse, noted: "Their main concern is to be sure the IP fits their need and that the changes required do not cost more time than for reinventing it."

"Quality, quality, quality," said von Vignau, "then user documentation, adherence to standards, testability and ease of integration."

Savage sees a hierarchy of needs. "Functional correctness, does it work?; ease of integration, the easier, the more value; value to the SoC, functionality that differentiates it; business value, make versus buy; and SoC actualisation."

What about the security issues? Ling noted: "In the early days, there was a lot of paranoia about protecting IP rights, particularly on the hardware side. This inhibited the trade of hard IP because the licensee inevitably needed access to the underlying features. From a software perspective, almost all vendors now provide an element of source code disclosure."

Savage commented: "Though still an outstanding issue, its severity has been reduced by two factors: semiconductor companies have largely complied with IP contracts and licenses, which has raised the level of trust, at least in the West; and there are some viable secure design flows from companies like Synplicity and ARM."

And von Vignau noted security is still a major problem, reflected in the legal battles to close licensing agreements. "There is a lot of work going on in institutes and universities on encrypting IP, but none are watertight."

Is IP more than software; does it, for example, stretch to design services? von Vignau: "The term 'IP' covers digital soft and hard components, software programs, analogue components, verification suites and so on."

Saucier believes IP isn't shrink wrapped. "Using IP means using the design blocks and design skills of a supplier recognised as having a high level of experience."

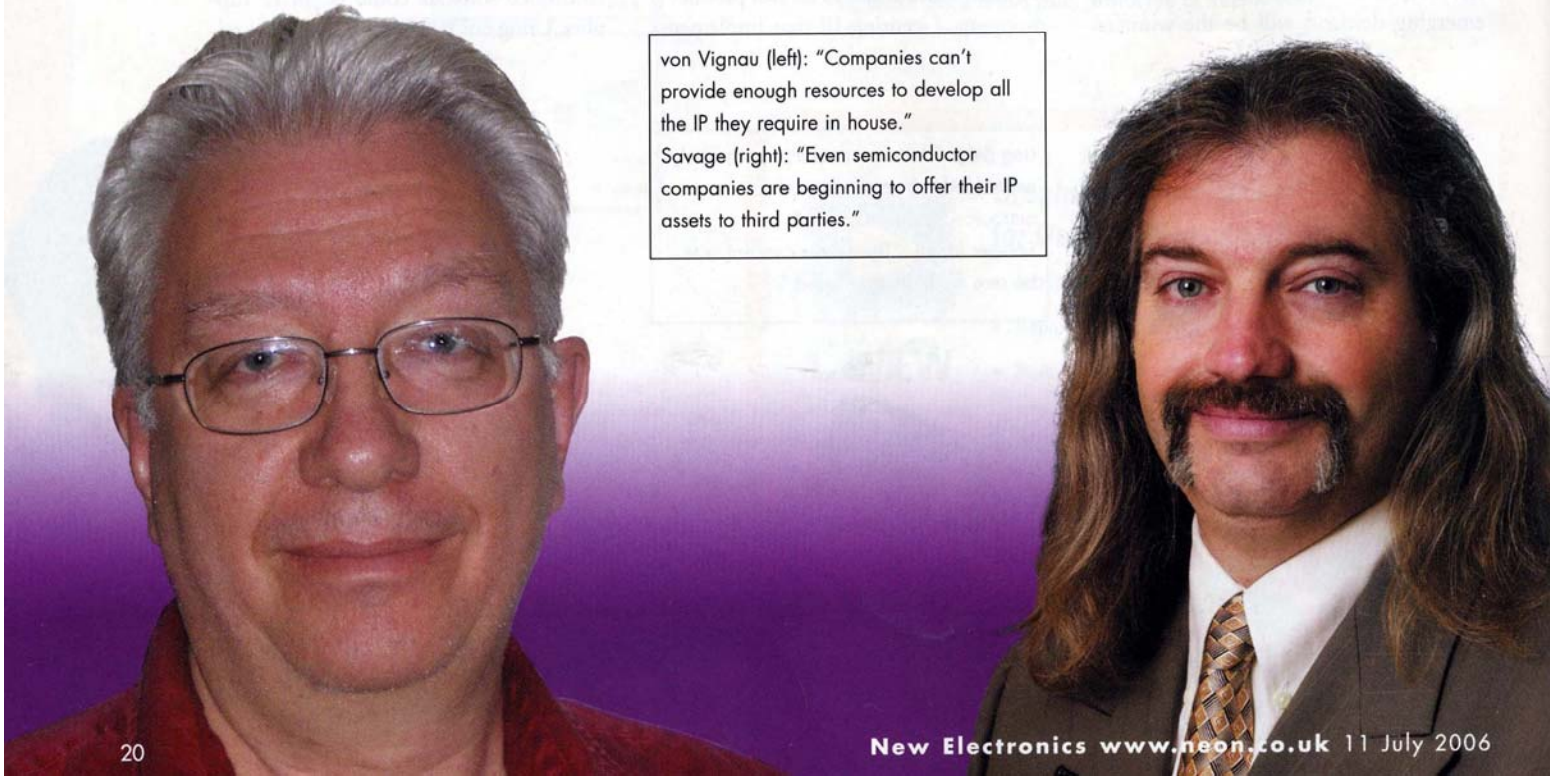
Savage: "Customers want IP to be delivered as a 'shrink wrapped' package with the deliverables necessary for easy integration. There are legitimate reasons why IP companies may offer design services, but if it is required to use the IP, customers should beware."

Finally, is the use of outsourced IP inevitable, or are the challenges too great?

Ling: "It's already here. The amount of IP – particularly embedded software – that can be outsourced increases daily."

von Vignau: "I believe this is inevitable as companies cannot provide the resources to develop all the IP they require."

Savage concluded: "You can usually buy IP for 10 to 20% of the cost of designing it yourself and you don't need to invest in specific expertise. You benefit from a history of successful implementations versus betting your engineers will design something new the first time. But, finally, your engineers can focus on what truly differentiates the product, as opposed to something others have already done."



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