

Beside the Seaside



By Mike Green, Managing Editor, EPN

Monterey is more often associated with good surfing, the music of Jimi Hendrix, and the writing of local boy John Steinbeck than with the advance of technology. This is starting to change, however, as over the last few years it has been the venue for one of the largest congregations of those poor individuals who make up the electronics press.

Over the last two decades, the GlobalPress organisation has gained a strong reputation for connecting technology-innovating companies with journalists from all around the world. Its annual electronics summit event, which has been staged at this venue on four occasions now, has become an important date in the calendar of hacks like myself, and despite the delightful setting there were plenty of hard words being said.

⇒ What does the future hold?

Proceedings were opened by Dr Bernard Meyerson, CTO of IBM Technology Systems, the \$35-billion "Big Blue" division which is concerned with semiconductor development. He voiced the opinion that the days of following Moore's Law blindly are gone forever. Simply scaling down technology will no longer be enough, and we will have to atone for our past sins. As he bluntly put it, "Moore's Law predicts how you make things quicker and less expensive, but it doesn't tell

the factors together, and trying to optimise all of them at once. It won't be possible to just focus on speed alone." Manufacturers will have to consider what is happening at the material level, at the chip-design level, and at the system-design level.

Chartered Semiconductor's vice-president for marketing, Kevin Meyer, reiterated Meyerson's view of a holistic approach. In his word, "Design-for-Manufacture needs to be built-in, not just bolted-on. Its importance will cut across the whole supply chain". He voiced the opinion that foundries, IP vendors, design-centre partners, and EDA suppliers will all need to be involved if we are to overcome the challenges of next-generation architectures.

AMD's business development manager, Jeff Underhill, told the audience that the future, of course, lied in multi-core computing, with demands of areas like medical imaging, storage area networks,



you anything of how to go about actually doing this. Scaling is one thing, but of course atoms don't scale. We are now reaching the point where you can no longer do that, you can't work in half atoms." Oxide layers won't be able to scale down as they did in the past. As so few atoms will be involved in the layers of the semiconductor components of the future, the slightest variation will have a profound effect on their characteristics. "We can't simply base our strategy on making structures smaller; we need to invest in new technologies that can allow performance levels to continue increasing," he concluded. His solution is to employ what he describes as a "holistic design": "This means literally worrying about everything, by looking at all

security scanners and advanced communications all crying out for more and more bandwidth. However, he was quick to warn that "it's no use having increased processing power if you can only fill half your racks." The performance per Watt will be of prime importance; otherwise the huge levels of heat dissipating from each chip will be impossible to deal with.

Tensilica's founder and CEO Chris Rowen is something of a Monterey veteran. His company has been involved in this event since its inception, and now looks ready to graduate to the semiconductor industry's major league. He also feels the most pressing problem we are facing is power efficiency. "There is a necessity for us to rethink the processor strategy that the industry employs if we are going to address the challenges that lie ahead," he told those assembled. "We are reaching a limit in the power-density increase that we can expect from scaling, so we can't rely on just going down to lower architectures, but we must do it through better design."

⇒ When to integrate and when not to?

Among many debates that took place over the course of the four-day event was one on whether there would be long-term value in the development of System-in-Package (SiP) devices. Jim Walker of Gartner argued that although there will be huge opportunities for System-on-Chip (SoC), nobody should underestimate SiP, as it might offer greater charm than SoC in certain areas, since it allows for mixed-die technologies (both analogue and digital) as well as

for use of different semiconductor processes (CMOS, SiGe, GaAs, and so on). He noted that SiP applications are actually growing more rapidly than those of its counterpart, and argued that as "the volume markets are getting increasingly reliant on customisation, putting everything on a single chip is becoming less viable." He concluded that the "the lower NRE and faster development times that are so endemic of the current market suit SiP." Moshbar Yazdani of HP also advocated the greater use of SiP in future OEM designs, but stated that "We need the tools which will allow system designers to choose which SiP solution best meets specific requirements, and at the moment nobody wants to take responsibility for investing in the development of such

tools." He also brought up the point that, with several potential semiconductor suppliers involved, there will need to be "close collaboration between them if the finished device is to be successfully delivered to the OEM." Though he has faith in the long-term prospects for SiP, Yazdani feels that it will still be "three or four years before we start seeing what this technology can really do." Several speakers contended that there would be the need for a common platform and open standards to allow multiple vendors to bring their specialised abilities into the mix, and Scott Jewler of packaging experts Stats ChipPac held the view that "if SiP is just an afterthought it won't be effective. It needs to be considered from the very beginning of the design."

⇒ Where are the new opportunities?

Though the telecommunications sector has taken quite a beating over the last five years, it is now coming back with a vengeance. Ben Naskar of PMC-Sierra said that "the mobile sector is still dominated by voice, but we are about to cross over into data-centric era, which will result in a whole new set of revenue streams being created." In order to support these new services, a far more extensive infrastructure will need to be put in place. He explained how a greater number of nodes can be deployed without affecting the back-end, thanks to remote radio base stations being used to enhance coverage. However, the question still remains as to whether the industry can ever get back all the money that it ploughed into next-generation mobile communications.

With all this data flying around, there is also the dilemma of where to put it all. Richard Clemmer, the new CEO of Agere, stated: "Digital storage within the consumer space will grow by 35% in the next 4 years." He envisaged a future in which hard disks and Flash will have equal prominence in portable products. The advent of smaller format HDDs should bring them into a far greater number of portable goods.

⇒ Who needs digital?

While in previous years analogue players had been thin on the ground, this time the sector was more than adequately represented, with the likes of National Semiconductor and Maxim among those joining the party. Lewis Counts of Analog Devices told the journalists present that the "growth rate of analogue products has surpassed that of the industry as a whole over the last four years." And although the current analogue content within a digital still camera is only a couple of Euros at the moment, the next generation of these products could require as much as 15 Euros worth of analogue ICs. Similarly, the medical-imaging market alone could present a \$1.5-billion opportunity for manufacturers of these devices in the near future.

⇒ Where do we go from here?

In conclusion, the semiconductor world may be filled with uncertainty, but given the vast number of challenges that still lie ahead, there should continue to be no shortage of possibilities for companies who have good ideas and hard-working employees.

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