

# The promise in microchips

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In a world that is increasingly electronic and reliant on microscopic integrated circuitry, the investment of Abu Dhabi in becoming a world leader in microchip technology is likely to pay off handsomely.

Abu Dhabi has pinned its high-tech hopes on the semiconductor industry, and the capital's investment company charged with generating this specialised leap forward has set its sights firmly on an important raw material needed for its chip making – young graduates to seed a new sector.

In a few years, Abu Dhabi, via an investment by the Advanced Technology Investment Company (ATIC) in the chip maker Globalfoundries, will be home to one of the most technologically advanced industries in the world.

To house its chip making, ATIC, an investment company owned by the Abu Dhabi Government, announced it would invest US\$3.6 billion (Dh13.22bn) to expand the capacity of its Globalfoundries business and outlined plans for building a thriving semiconductor community in the capital.

The plans call for a 3 square km stretch of land near the Abu Dhabi International Airport to be set aside for a cluster of semiconductor research houses, industry offices and a microchip foundry training facility.

The stakes are high for Abu Dhabi, but so are the rewards, says Ibrahim Ajami, the chief executive of ATIC. "If they have the financial muscle to set it up and wait for the returns, it's a good opportunity," he says.

"I do believe that countries that have significant sovereign wealth have the financial might to invest and wait for long-term returns."

Semiconductors are at the heart of any electronic device. From cars to washing machines to electric shavers, the little integrated electronic circuits are a part of everyday life.

As companies discover more ways to embed microchips in various appliances to improve performance and function, the demand for them has rocketed – a key reason that ATIC opted to invest billions of dollars in its Globalfoundries business.

But the chips do not build themselves. And if Abu Dhabi is to achieve its high-tech ambitions, it will need to foster homegrown talent.

"We're obviously going to leverage a lot of the existing infrastructure around universities such as Masdar," Mr Ajami says.

Enter the US-based Semiconductor Research Corporation (SRC), which directly guides the standards behind the designs of new microchips.

The SRC recently co-hosted a conference with ATIC at the Yas Hotel that brought together industry professionals including academics, chip makers and company chiefs to discuss creating new technology concepts.

ATIC had its own message for the industry experts attending – it is serious about putting Abu Dhabi on the high-tech map, and it wants its own universities and graduates to be directly involved.

“Even though ATIC is a commercial entity that’s focused on getting financial returns, we are very committed on creation of an ecosystem here that contributes to the transformation of society,” says Sami Issa, the executive director of ecosystem development for ATIC. “But the first step in creating that ecosystem is to integrate the education system into it.”

To make the event a bit more interesting, organisers dreamt up a non-existent technology device, prompting speakers to discuss the technical components that would be needed to build it. While the task was intended to stretch some of the world’s most brilliant minds, it was also a way to think outside the box just enough so that perhaps some of the concepts could be applied to devices that exist today.

The imaginary device, dubbed the “iKnow”, was an item the size of a mobile phone that recorded all of one’s life experiences and was able to perform such tasks as real-time language translation and use face recognition to identify old friends, even if one might have forgotten who they were.

“One of the things you immediately start worrying about is what kind of battery would you put into it that would last for more than a day,” says Ralph Cavin, the chief scientist at the SRC. “So the theme of the event that we focused on was on minimal energy and what we could do to make an electrical system’s orders of magnitude more efficient than what we do today.”

Such concepts of course do not just materialise at a tech conference, but the event highlighted how the semiconductor industry and universities in the UAE could work together to design and create research programmes needed to address such a power system and perhaps eventually build the essential parts of this futuristic device.

“From ATIC’s perspective, working with SRC is a natural move,” Mr Issa says. “We’re a major force in the semiconductor industry, and the SRC is in the business of linking the industry and the educational system.”

“If you look at the Middle East, only one university in Qatar is linked to the SRC. That needs to change. We need to have universities in the UAE be able to submit their research into the semiconductor ecosystem.”

Larry Sumney, the president and chief executive of SRC, concurs. “This now shows the world that Abu Dhabi is serious about building a semiconductor ecosystem.”

The next step is to build on links forged among the SRC and the six local universities to create engineering graduate programmes that advance the semiconductor industry.

Academics walked away from the event impressed with what could happen.

“Although our current programmes focus on advanced energy and sustainable technologies,

they can be expanded to address the needs of the semiconductor industry,” says Marwan Khraisheh, the dean of engineering at the Masdar Institute of Science and Technology.

“We are developing a Master’s programme in microelectronics and there will now be a large focus on low-power electronic systems. We believe that what ATIC is doing is very important and we, as a graduate-level-focused university, will be able to contribute to the growth of that sector.”

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