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The technological development rests... on sand

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Who has never played with the television through a controller or has never rotated a smartphone or a tablet to look better at a photo?

Well, that piece of technology that allows us to rotate the image has been invented by an Italian. We are talking about Bruno Murari, former director of the Laboratories of Research and Development of the STMicroelectronics, who is now in his retirement but still active as scientific consultant also in companies in France and Switzerland.

Murari, qualified technician who has received two Honoris Causa graduations from the Cà Foscari University and the Polytechnic of Milan, is one of the testimonials of the project of business culture in the istituti superiori europei (Secondary Schools with a European focus) of the Junior Achievement association. The students are stimulated in putting themselves in the game and creating, trying to understand that sensation of healthy competition found in the job market. Even this year, interested students will challenge each other in Turin during next May, designing and planning an entrepreneurial idea. The best one will be coached to participate in the final competition that will take place in London. For [the isis Facchinetti of Castellanza](#) it has been an important event. The professor Ornella Pili commented: "This kind of education allow us to better involve students that experiment and put themselves in game, making sometimes unexpected elements emerge from their personality."

Bruno Murari talked for about 90 minutes, a dense lesson built with images and even a lot of anecdotes of a life spent experimenting in laboratories. In his career he personally designed 10 integrated circuits and has directed the development of over 2000 of them: "Everything is based on the sand, the silicon. It is a quite inexhaustible material that allows unique processing and performances. Thanks to the automation process this material allowed us to deeply innovate and will keep doing it. In 1975 Moore announced his law: it will be possible to double the complexity, keeping prices unaltered, every two years. Well, that law has regulated just like a clock the progress of technology."

During his long and satisfying career, Murari lived the electronic beginning: "It was a really new world. We have been working together for twenty years, sharing with each other information and collaborating. Just twenty years later we started putting patents, in particular for building a wall between those who had built their position and those who wanted to get into this field. I must say that patents limited the creative energy which characterized the beginnings. Today patents are fundamental for the start up because without patents we cannot find financial support."

To student, Bruno Murari's advice was "be hungry, be crazy (as Steve Jobs said) but also decisive": "We created the speedometer by chance, during the crisis. We had this idea and our boss accepted the challenge. He gave us a budget of \$10 million, a team of 20 people and three years of research. In the fourth year we presented the first

project created for American washing machines which have a problem with centrifuge which turns at 1000 rounds. In the next year economic margins were about €2 million and so on for the third one. We were the target, in particular of colleagues who lessened our work. Since the fourth year, instead, the speedometer had a peak: during ten years we have passed from zero to €1 billion of margin.'

Today that project is widely used for different technological products from mobile phones to videogames to cameras, appliances and cars: "During my career I had also to support failures, but just such a result like this one was enough to give energy and enthusiasm to continue. Today ST has a leader position in a world-wide level in the dedicated integrated circuits field. It obtained more than four patents concerning the circuits project and the power of technology and MEMS systems. But there is still a lot to do. Tomorrow is surely in medicine to develop systems allowing to replace with bit, the physical models which have to be examined: by this way we could have enormous advantages and limited costs for attending external patients. Just think of the evolution of the post, once delivered during many months, then weeks and days, and now available in real time thanks to emails."

Technology doesn't stop, the ideas which will change the world are still to be discovered: "Start by your secret wishes and work on them. Try to focus on the object satisfying them, functions they have to manage and the components needed. But remember that at the base will be always the sand, maybe perfectible in some abilities with other materials such as graphene."

So, holy sand, concluded Bruno Murari, who stayed on to speak with students, in a direct and simple way, like a real impassioned man. He doesn't think to be a great man and when we ask him what he feel to have transformed our daily lives, he smiles: "I just brought my piece of sand..."

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