When Ivrea Gave Computing Lessons to Japan

In memory of Sandro Osnaghi

On May 29, 2025, at the Confindustria offices in Ivrea, an event of exceptional historical and technical significance was held: "*The Extraordinary Years of Olivetti Computing (1970–1990) – A Tribute to Sandro Osnaghi*[1]*."* Organized by the "*Spille d'Oro Olivetti*" association, the conference aimed to shed light on two decades of technological innovation during which Ivrea and Olivetti stood at the forefront of global progress.

It did so by honouring one of its most influential protagonists: **Sandro Osnaghi**.

Sandro Osnaghi in 2014

A collective, clear, and fascinating narrative brought into sharp focus what Olivetti truly was in the 1980s, not just typewriters, but a cutting-edge technological powerhouse, ahead

1 Gli anni straordinari dell'Informatica Olivetti (1970 - 1990) – Omaggio a Sandro Osnaghi"

of its time in an extremely competitive international landscape. Decades later, those who were directly involved – engineers, researchers, computer scientists, software and hardware pioneers – gathered to tell the story of this "*glorious but forgotten decade*."

Franco Marra opened the conference with a passionate and well-documented overview of the technological context from the 1960s to the 1980s, laying the groundwork to understand the revolutionary scope of Olivetti's projects. He reminded the audience that as early as 1969 – when Ethernet was born and the first message was sent over the Internet – Olivetti was already working to surpass its own obsolete solutions. "*The TC800 system and its COSMOS operating system*," he explained, "*marked a turning point: they anticipated concepts such as LANs, multitasking, and real-time resource management—well before these became standard*."

But it was with **John Lomas** that the tribute to Sandro Osnaghi truly came to life. His presentation took the audience on a journey through the decade 1974–1984, when the design and development of the MOS operating system propelled Olivetti to the top of global technology. "*While UNIX was gaining traction in academic circles, we, with Osnaghi in Cupertino, were already aiming further*," said Lomas, highlighting the distributed file system architecture, real-time nature, and use of the Pascal+ language with Hoare monitors – radical choices that would only become common much later.

Gianluigi Castelli, involved since 1979 in compiler design, shared another face of innovation: the daily struggle against technical limits, with feats that now seem legendary, chief among them, the "*Frankenstein Project*": the creation of a FORTRAN 77 compiler for the Linea 1 MOS in just four months, merging the F77 front-end from Bell Labs with a PCC code generator for the Z8000 – without documentation and relying solely on the determination and talent of a small group of engineers.

Enrico Frascari opened a window into the future: Artificial Intelligence. As early as 1984, with the Olivetti AI Center split between Ivrea and Cupertino, Olivetti was collaborating with Stanford, SRI, Caltech, and companies like Xerox PARC and Digitalk. Expert systems were being developed for diagnostics and credit analysis. They were using Smalltalk – the language that would later inspire Java and Python – and working on Lisp Machines and the M28 PC. "*In 1987, Olivetti was a key player at the world's leading AI conference, IJCAI in Milan. We were at the cutting edge*."

Flavio Serughetti, with a presentation that combined technical depth and storytelling, brought the audience inside Olivetti's *Software Factory*: an integrated production system spanning Italy, California, and Japan, which, in the early 1980s, used computer networks connecting Ivrea to Cupertino via dedicated voice/data links, a kind of Internet prototype. Everything ran on UNIX/BSD, with compilers, file transfer systems, mail systems, Ingres databases, VAX 780s, and PDP11s. "*A system that networked 2,000 users, from firmware engineers to hardware developers. No one else in Europe had anything like it*."

The most anticipated, and perhaps most surprising, moment came with **Tonina Scuderi's** account of the NOKYO Project, which also involved **Cesare Monti** (present at the conference), who managed the operation with Scuderi and then stayed in Japan for 17 years as head of marketing.

It was here that the conference's deepest message was felt: not just remembrance, but the reclaiming of a forgotten global excellence.

In the late 1970s and early 1980s, Japan was the technology mecca, dominated by giants like NEC, Fujitsu, and Toshiba. And yet, in that closed-off market, the only Western outsider to survive – and win – was Olivetti. Its Japanese affiliate OCJ, which supplied intelligent terminals to NOKYO's agricultural

agencies, was losing ground when the Japanese government decided to invest billions of yen into linguistic localization (handling 40,000 KANJI characters), effectively obliging any future-installed computers to speak Japanese. "*That's when*," Scuderi recounted, "*Osnaghi and his team pulled off what was considered impossible: making MOS capable of interacting in Japanese*." It was a move that saved the entire Asian operation and led to MOS being adopted in Japan in 1983, before the official Linea 1 release.

Another extraordinary story came from **Vincenzo Baruzzi**, who retraced how Bank Leumi in Israel adopted MOS, and when they saw the installation in Israel, Bank ABN in the Netherlands also followed suit. The Israeli bank sought a more autonomous, scalable, and cost-effective alternative to IBM terminals linked to mainframes. "*Olivetti*," Baruzzi explained, "*proposed a client-server solution using Ethernet and COBOL transactions – well before these became market standards*." The system proved so robust and advanced that even after ABN and AMRO merged in 1994, Olivetti's solution outperformed IBM's, despite MOS production having ended.

Finally, **Gianfranco Casaglia** outlined the full evolution of Olivetti's systems from the 1970s to the 1990s. From the A7 to the TC800, from BCS systems to Linea 1, to the merger with AT&T, the introduction of UNIX, the LSX5000 multiprocessor servers, and the strategically risky move into mobile telephony. A comprehensive portrait of a company that dared to combine hardware, software, and vision.

Throughout the conference, **Clara Mancinelli** was repeatedly remembered – Osnaghi's right hand, instrumental in implementing both the TC800 and MOS.

"*I've never met anyone*," confessed John Lomas, "*who could understand code the way she did. It was like she spoke to the computer. And I say this having known Bill Joy (co-founder of Sun Microsystems in 1982 and co-author of Java). He is remembered and considered as the greatest UNIX programmer*

of all time – Clara is only remembered by us. ***If Sandro was the king, Clara was the queen****...*"

"And, just for the record, Clara is very shy and doesn't like being talked about... but we're disobedient!"

Clara Mancinelli in 1976

In the audience, besides industry professionals and Osnaghi's former colleagues, there were also many citizens from Ivrea and the Canavese region. It was to them that the final message of the conference was directed:

"*To the sons and daughters, grandchildren of this area – who may not know what their city once meant in the world – we remind you: Olivetti in the 1980s was synonymous with global excellence. Not just in ideas, but in deeds*."

Because yes, Olivetti was also industrial poetry, community, and culture. But it was – and it's right to say it with pride – one of the most technologically advanced companies on the planet.

Gianluigi Castelli, Riccardo Mazza, Franco Marra, John Lomas,
Tonina Scuderi, Cesare Monti

Frascari, Serughetti, Monti, Castelli, Scuderi, Casaglia,
Marra, Lomas, Baruzzi

Riccardo Mazza, Franco Marra, Tonina Scuderi, John Lomas

Gianluigi Castelli, Tonina Scuderi, Gianfranco Casaglia, Franco Marra

John Lomas with the photos ‘the way we were in 1980’

The group, with Osnaghi’s 3 daughters in the front

Those Voices That Won't Fade

There are days when the past comes knocking, not to ask for space, but to illuminate the present. In Ivrea, on May 29, something happened that went beyond a conference or a memorial. A group of men and women, not young anymore, but no less alive, stood before an audience to tell a story that no one should forget.

They spoke of the extraordinary years of Olivetti computing. Not as former employees or executives, but as witnesses. Witnesses of a time when Italy stood at the forefront of the global digital revolution. A time when Ivrea was in dialogue with Cupertino, when code was written that would change how we think about operating systems, networking, and machine-human interoperability.

Leading them then, as now *in memory*, was **Sandro Osnaghi**. Everyone spoke about him. Not with the rhetoric of celebration, but with the affection and respect reserved for a professional father figure, a rigorous thinker, a man who knew how to unite vision and method. Osnaghi was not a man for the spotlight. He preferred code to the limelight, architecture to diplomacy. But everyone knew that without him, MOS would never have been born, the Software Factory would never have existed, and perhaps not even that extraordinary bridge between Ivrea, Israel, Japan, and California.

And so it was that **Franco Marra**, with a calm and precise voice, outlined the historical and technical context in which it all began. He spoke of the TC800, of COSMOS, of the first insights into an architecture that anticipated LANs when no one even used that term. He recalled the years when IBM was the absolute reference point, and Olivetti was trying – and succeeding – to do things differently.

Then it was **John Lomas's** turn, and in his speech, there was something that went beyond mere reporting: a deep pride, mixed with gratitude. Lomas spoke of the birth of MOS, of the

Cupertino laboratory, of the days when the future was being designed by choosing an extended Pascal, a distributed file system, a real-time logic at a time when the term itself was unknown to most.

Gianluigi Castelli told of the impossible: a FORTRAN 77 compiler built in four months, reassembling pieces of code taken from here and there, fusing them with ingenuity and creative recklessness. They called it the "*Frankenstein Project*," but what emerged in his account was the enthusiasm of those who worked with urgency, with passion, with a nearly adolescent sense of challenge.

Enrico Frascari, for his part, recalled the other frontier: Artificial Intelligence. At a time when no one, or almost no one, dared to say the word, Olivetti believed in it. They collaborated with Stanford, with SRI, with Caltech. They developed expert systems for banks, for decision-making, for language comprehension. They were talking about Smalltalk when Java didn't yet exist. And they did it with the means of the time, but with a spirit that today feels more relevant than ever.

Flavio Serughetti mapped out the *Software Factory*: a productive environment distributed between Ivrea, California, and even Japan, with 2,000 users connected on a network in the 1980s, on VAX and PDP systems, with Unix/BSD, Ingres databases, and a mailing system. An embryonic corporate Internet before its time. An extremely advanced ecosystem, which no one in Europe had yet seen.

Then came perhaps the most moving moment. When **Tonina Scuderi** spoke of the NOKYO Project, and the fight to save Olivetti's presence in Japan. A challenge that seemed doomed from the start: 40,000 KANJI to integrate, a closed market, a government funding its national champions. But Osnaghi didn't back down. And they made it. The Japanized MOS came out before the official Linea 1, and saved the subsidiary OCJ. Even in that, Osnaghi was both stubborn and visionary.

Vincenzo Baruzzi, with the calm of someone who has seen and experienced everything, told of the conquest of Bank Leumi in Israel and the subsequent expansion into the Netherlands. There too, Olivetti's technology arrived before the market. There too, MOS proved to be much more than an operating system: it was an idea of infrastructure. Of reliability. Of a distributed future.

Gianfranco Casaglia closed the circle, recounting the evolution of Olivetti systems through to the 1990s. Through to the difficult season of strategic choices, alliances, the transition to telecommunications. But even then, he recalled, the spirit of the glorious years was still present: the one that believed in the connection between engineering and humanity.

In Ivrea, in that packed room, there weren't just slides and names on the agenda. There were lives being reignited. There was the awareness that memory is not nostalgia, it's the construction of meaning. There was the urgent, almost emotional, need to say: **we were there**. And what we did mattered.

Today, when everything seems fluid, dematerialized, volatile, those voices, firm, precise, animated, give us a lesson

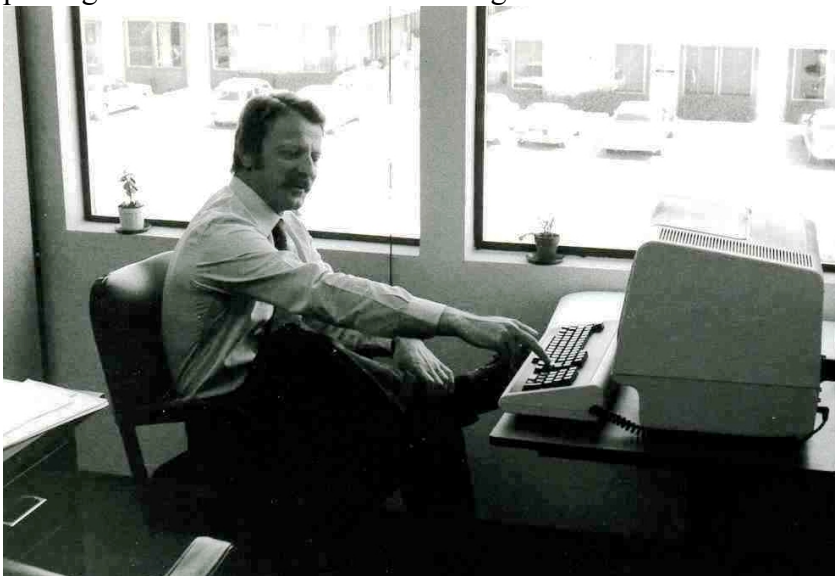
worth more than a thousand business plans: that **real innovation is born where there are skills, trust, collaboration. And a vision that knows how to look beyond the quarterly report**.

Forty years have passed. And yet those voices still shine today.

Because the future – the real one – is always built by those who truly believe in it. And they, those Olivetti men and women, believed in it with all their hearts.

Sandro Osnaghi, the visionary who saw the future from Ivrea to Cupertino

Behind every great silent revolution, there is often a figure who works far from the spotlight, preferring substance over show, vision over visibility. Sandro Osnaghi was one of these figures. And if today we are finally speaking of the "*extraordinary years of Olivetti's computing*," it is also to do justice to a man who left a profound mark on the history of innovation, without ever placing himself at the center of the stage.



Sandro Osnaghi, in his office in Cupertino, California, 1980

Engineer, systems architect, pioneer of open architectures, Osnaghi joined Olivetti in 1974 and quickly became Director of Software Development in the Computer Products Division, at the heart of Ivrea. But it was in the United States, where he led the operating systems department at the Advanced Technology Center in Cupertino, that Osnaghi became more than just a technical manager: he became a global thinker, capable of dialoguing with Stanford, UCLA, and with the great centres that were shaping the digital age at that time.

He was not interested in chasing trends. Osnaghi aimed straight for the essence: building robust, scalable systems, truly in service of people. That's why, when others locked themselves into proprietary solutions, he bet on interoperability and open standards. In 1985, he was among the founding members of X/Open, an international consortium that envisioned the world of open software long before it became mainstream.

His presence echoed in many of the stories told at the conference on May 29 in Ivrea: every time MOS, the Software Factory, Japan, Bank Leumi, or the Olivetti ATC in Cupertino was mentioned. Osnaghi was the thread that held together talent, method, and vision. A technical conductor who knew how to listen, decide, innovate.

Famous – and nearly legendary – was his meeting with a very young Bill Gates, who showed up in Cupertino with a commercial proposal for his BASIC interpreter. Olivetti, then led by different strategic directions, decided not to invest. Osnaghi was present but he continued on his own path. He wasn't a man to have regrets. For him, computing wasn't about market conquest, but about designing the future. A tool of civilization, not just of profit.

This vision followed him even beyond his Olivetti years, when he dedicated himself to projects for the digitalization of the public administration. He was among the promoters of the SPC – Public Connectivity System, and didn't hesitate to criticize it, years later, when he saw its evolutionary limits.

Because Osnaghi had the courage to say that it's not enough to digitize, it must be done well, it must be done with forward-thinking.

Reserved, private, razor-sharp, he loved the concreteness of his ideas more than rhetorical narratives. Those who knew him speak of a demanding but generous teacher, of a man who taught through coherence. "*The engineer who whispered to Bill Gates*," wrote the newspaper L'Unità in 2003. A perfect image to describe his quiet strength.

In Ivrea, his presence is felt everywhere: in the words of his colleagues, in the system architectures recounted, in the memories shared with affectionate precision. Not like a shadow, but as a reference point. A man who built bridges between worlds, who left a legacy made of ideas, methods, and future.

Because without Sandro Osnaghi, many of the successes we now remember would never have existed. And today, more than ever, it's clear how right – and necessary – it is to place his name at the centre of the story.

Sandro Osnaghi passed away in Milan on February 9, 2025, at the age of 84. But his code still runs. And his vision, even today, teaches us to look ahead.