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Intel4004 and its Succession Processors

Masatoshi Shima designed/developed the Intel4004, the world's first general-purpose commercial microprocessor together with Intel Corporation when he was working at Busicom Corporation. Using the pMOS10 micron process, this processor was mounted on a package featuring about 2,300 transistors, a 3 x 4mm die, and 16 pins. Because 4bit was used for the processing unit, required information processing was realized by operating multiple arithmetic with software. This became the original of the x86. After that, he engaged in the development of the 8080 and the Z80.

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Research and Development of Supercomputers

Supercomputers are ultrahigh-speed computers. Supercomputers are classified into two types, vector processing by pipeline processors and parallel processing by multiprocessor.

In Japan, the development/commercialization of supercomputers started by installing vector processors in mainframe computers. The development of supercomputers by various companies was as follows: FACOM230-75APU (Fujitsu1977), HITAC M-180AP (Hitachi 1978), M-200H IAP (Hitachi 1979), MELCOM COSMO 700 III IAP (Mitsubishi 1979), M-280-H IAP (Hitachi 1982), and ACOS-100 IAP (NEC 1982). After this, Fujitsu manufactured the VP series, Hitachi manufactured the S-810 series, and NEC manufactured the SX series, fully entering the global supercomputer market. Regarding pipeline processors, from the 1980s to the 1990s, these evolved into shared-memory multiprocessors. The Numerical Wind Tunnel (NWT) co-developed by the National Aerospace Laboratory of Japan and Fujitsu (Fujitsu VPP500), Hitachi S3800, and the earth simulator (NEC SX-4, later SX-5) co-developed by RIKEN and NEC fall into this category.

Regarding parallel processors, in Japan, these were commercialized from the 1990s. AP 1000 (1992) and AP 3000 (1996) by Fujitsu, SR 2001 (1994), SR 2201 (1995) (commercialization of CP-PACS co-developed by Tsukuba University and Hitachi, including a quasi-vector pipeline), and SR 8000 by Hitachi, Cenju-2 (1994), Cenju-3 (1994), Cenju-4 (1997) fall into this category.

From 2006, the K computer was developed with help from the next generation supercomputer project by the Ministry of Education, Culture, Sports, Science and Technology. K computer adopted massive parallel processing and won the best execution performance in the world for a LINPACK.

Yoshiyuki Kimura, Sunao Torii, and Motoaki Saito found the venture company PEZY and succeeded in manufacturing the PEZT-SC (2014) featuring the world's top-class power efficiency by developing a massive parallel processing/low power consumption chip.