

Chapter 22. The Japanese Create a Stir

The Quest for Artificial Intelligence, Nilsson, N. J., 2009.

Lecture Notes on Artificial Intelligence, Spring 2012

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Overview of Chapter 22

- Japan's Ministry of International Trade and Industry (MITI) launched a joint government and industry project.
 - Fifth Generation Computer Systems (FGCS)
 - Institute for New Generation Computer Technology (ICOT)
- The Japanese project caused alarm in the United States and Europe.
 - Microelectronics and Computer technology Corporation (MCC)
 - The Alvey Program
 - ESPRIT

Chapter 22. The Japanese Create a Stir

22.1 The Fifth-Generation Computer Systems Project

The Fifth-Generation Computer Systems Project

- In 1982, Japanese government launched a project to develop “Fifth Generation Computer Systems” (FGCS)
 - The 5th generation: ULSI (Ultra Large-Scale Integration)
 - Its goal was to produce computers that could perform AI-style inferences from large data and knowledge bases and communicate with humans using natural language.
 - ICOT research center has built for the project whose directors were K. Fuchi and K. Furukawa

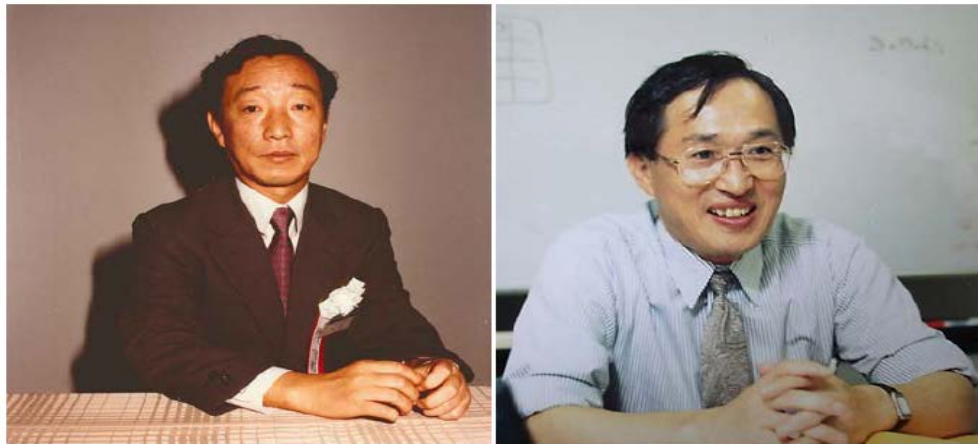


Figure 22.1: Kazuhiro Fuchi (left) and Koichi Furukawa (right).

Workstation and PROLOG

■ Workstation

- Consists of several processors
- Running in parallel
- Accessing multiple data

■ PROLOG

- Programming language based on logic
- Suited for Natural Language Processing, expert reasoning, etc.

- Workstation was used to run PROLOG program massively

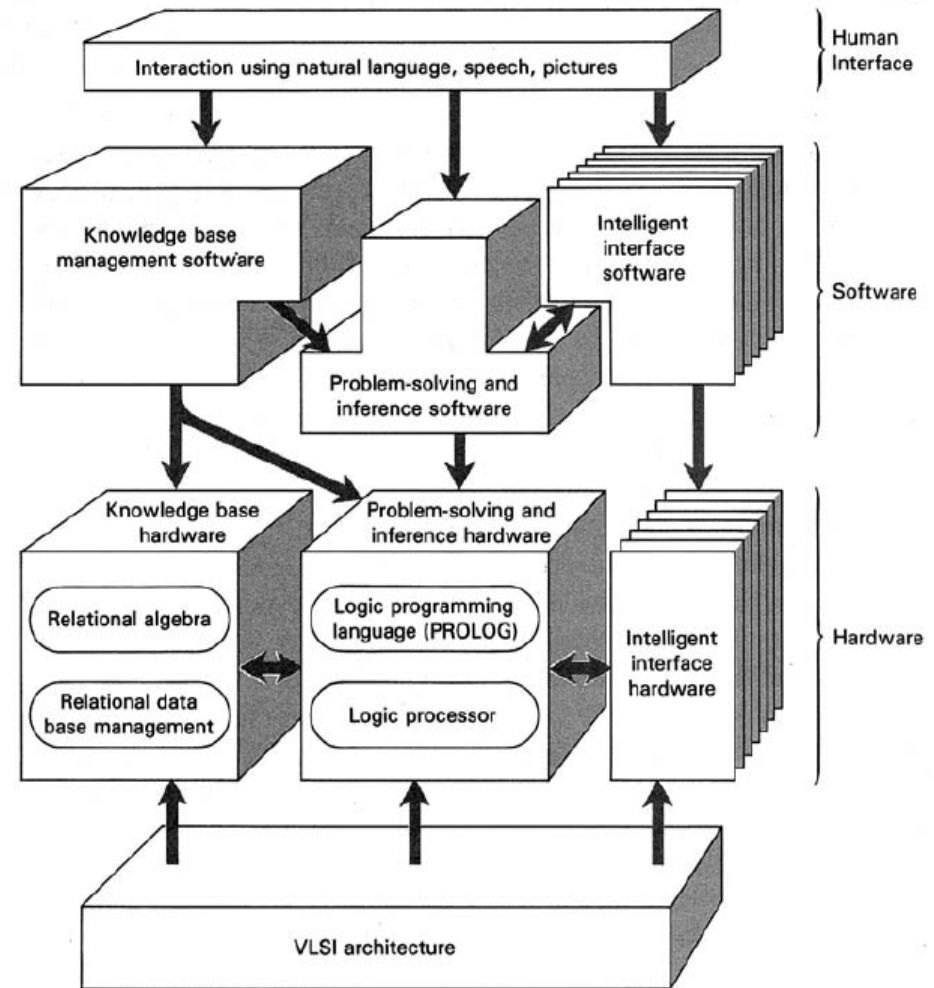


Figure 22.2: Fifth-generation system architecture

Products from the Project

- The project produces a number of PIM (Parallel Inference Machine) workstations
 - (ex.) MGTP, MENDELS ZONE, HELIC-II, etc.
- The project brings academic progress in
 - Symbolic processing
 - Logic programming
 - Concurrent languages
 - Deductive and Object-oriented DB
- However, faster PC speed and small number of applications make the project fall down



Figure 22.3: The PIM/p parallel computer system.

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22.2 Some Impacts of the Japanese Project

22.2.1 The Microelectronics and Computer Technology Corporation

- Microelectronics and Computer technology Corporation (MCC)
 - USA was alarmed by Japanese 5th generation computer system project
 - They established their own organization, MCC in Austin, Texas
- MCC focused on
 - Advanced computer architecture
 - Software technology
 - Microelectronics packaging
 - Computer-aided design of VLSI circuitry.

22.2.2 The Alvey Program

■ The Alvey Program

- British government started up a committee chaired by Mr. John Alvey to get advices in IT area.
- The committee recommended a 5-year program to mobilize UK's technical strengths in IT.
- The program goaled
 - Software Engineering
 - Man Machine Interface
 - Intelligent Knowledge Based Systems
 - Very Large Scale Integration

■ The program successfully ended with following results

- AI, Parallel architecture, VLSI, IC CAD, S/W engineering, Speech technology

22.2.3 ESPRIT

- **European Strategic Program of Research in Information Technology (ESPRIT)**
 - European response to the Japanese program
 - Supported three major categories
 - Microelectronics, Information Processing Systems, Applications
- **ESPRIT supported several AI-related projects**
 - Knowledge-based systems, logic programming, natural language parser, knowledge acquisition, machine learning
 - One successful outcome was Machine Learning Toolbox (MLT): Consisted of package of ML techniques