Chapter 22. The Japanese Create a Stir


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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
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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