



**The Original Technical Program for the
Amdahl Australian Intelligent Tools Program**

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TR 001 (1988)

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TR001 (1988)

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Remarks

This report contains the technical program originally proposed to Amdahl for the AAITP in mid 1988. Some details have been edited (primarily financial) to protect the various partners.

1. Introduction

1.1 Aims

The purpose of this program is the development of a family of "intelligent" software development tools. These tools will:-

- (a) Assist the schematic description of software system.
- (b) Simplify the specification and design process.
- (c) Aid in the planning of and execution of system tests.
- (d) Automate the System description process.
- (e) Allow for the "re-use" in the software process.

1.2 The intention is that the project should

- a) Produce a series of prototype tools operating in an extensible environment capable of being commercialized and marketed.
- b) Increase the Victorian Software Industry's technical base and mastery of commercially exploitable software tools technology.
- c) Provide graduate level training in software tool development.

2. Project Structuring

2.1 Staffing the project will be staffed by:-

- a) A director.
- b) Two lecturers.
- c) A fractional - time secretary.
- d) Graduate students depending upon budget constraints, between two and three funded by the program.³

2.2 Equipment

Access to IBM Compatible MVS and UNIX environment. Capable of supporting 30 terminals, delivering 3 MIPS plus 5G bytes of disc and 1x600 1pm printer

3. Project Organization

The project will be organized as a joint Program between the host institution and various software companies. In return for placing staff on the project, a software company will have an option or rights to exploit the results commercially on a basis to be determined

4. The Intelligent Software Development Environment

4.1 Introduction

The SDE will consist of a series of tools integrated into a consistent user interface, using graphics on low cost terminals such as IBM PC - class machines, MacIntosh or Amiga class machines.

These tools will be aimed at increasing the effectiveness of program development using standard programming languages. Tools will communicate via a standard user interface, a standard database and data dictionary.

However, the individual tools will be free-standing, and useable and saleable.

The tools will also recognize current developments in the understanding of program development.

4.2 Initial Tool Set

4.2.1 SODA - The Software Designer's Aid

SODA uses knowledge based techniques to assist a designer to recognize common components and interaction with design constraints during system specification. The system will use quasi-natural language to specify a system using a hierarchical decomposition.

4.2.2 Design Tracker (DETRACT)

A browsing-based design tracking tool which enables documentation to be created in a browsing network.

Adherence to strict hierarchic or layered description is unnecessary, however, the completed document collection, eg. horizontal layers, hierarchic slices and term associated searches.

A temporal browse is also possible, based upon the time-ordering of the creation of documents.

The system will also support a design decision and analysis feature which allows design decision reasoning to be documented, but not retrieved.

In this way, a document collection is viewed as a multi-dimension set of information.

4.2.3 Executable Diagrammatic Descriptions of Systems (EXDRESS)

Tools would be constructed which would allow for the construction of diagrams which describe a system and are executable. The objective would be to construct a system which allowed a graphic representation to be executable. In other words, no further refinement of building blocks should be required, and parallelism should be represented.

This project will include research into alternate system description methodologies.

4.2.4 Support for Traditional S.A. Tools

Automated techniques for constructing, editing and maintaining diagrams and system descriptions using a traditional S.A. methodology.

4.2.5 Project Tracking Tool (PROTRACT)

Allows project software process to be described as schematic showing phases and tasks to be performed. Includes CPM analysis and, eventually, an estimating tool.

A novel feature of this system is the event schedule which:

- a) Records the completion of various phases of the project as shown in the Project Description.

b) Initiates actions or request for action based upon the completion of events of various kinds.

4.2.6 User Interface Management System (UIMS)

ALL tools etc. used by the designer and programmer will be accessed via the UIMS which will provide a consistent

language structure for users, and will monitor and log all tool usage. This will allow interfacing with a TAME later, and also allow completed events to trigger the PROTRACT.

4.2.7 Configuration Manager (CONFMAN)

Configuration Manager will be necessary to ensure that the necessary consistency exists between the system descriptions and the products they define.

4.2.8 Component and Design Re-use Manager (CODREM)

Design and component re-use is a fundamental aspect of the software process. The CODREM tool will allow modules and designs to be classified and re-used at a variety of hierarchic levels.

This tool will use concepts from SODA.

4.3 Measurement Environment Tools (MENT)

An overall design requirement will be that the tools will eventually be integrated into a TAME [BASR88] based Management Environment. This will allow resource, project and quality tracking and control.

5. Project Structure

5.1 Remarks

The project will be structured as a team based graduate research project producing prototypes which will require further commercial development.

It will be a self-contained structure within La Trobe University with participation from the software industry.

Wherever possible the staff of the project will contribute teaching resources to La Trobe University.

5.2 Additional Funding Source

Funds to allow the project's expansion may come from additional sources such as:-

- a) GIRD
- b) Teaching Company Scheme
- c) Research contracts attracting 150% tax allowance.

5.3 Project Implementation

The project will begin by selecting a suitable nucleus of components from those specified in Section 4 dependent upon the initial funding. Other components will be added as additional resources become available.

References

- [BASR88] Basili, V.R. and Rombach, H.D. "The TAME Project: Towards Improvement-Oriented Software Environments" IEEE Transactions on Software Engineering, Vol. SE-14, No.6, June 1988, pp. 758-773.

