

# THE AWSAP ADVANCED ARCHITECTURE PROJECT

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## **1. OBJECTIVES**

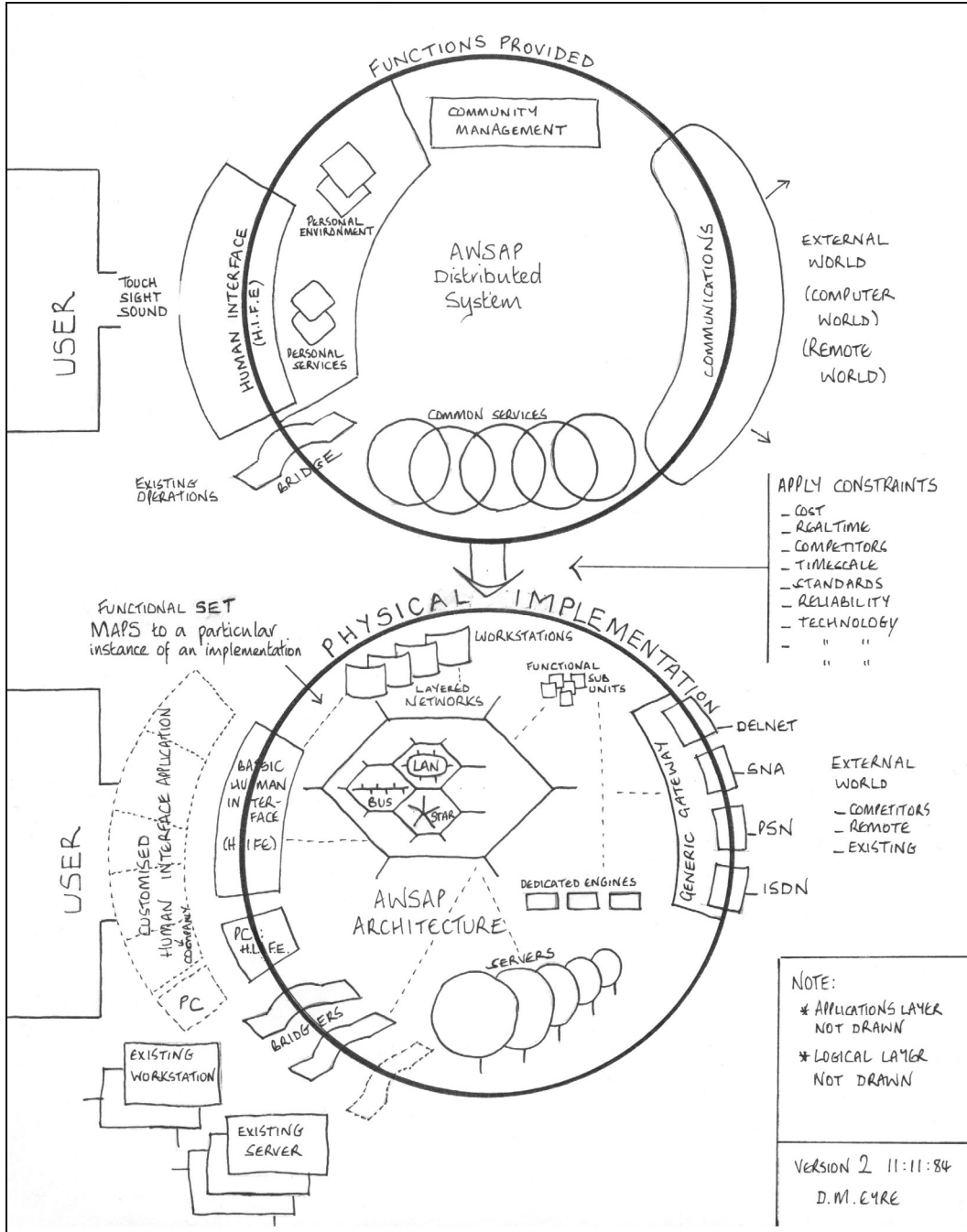
- 1.1. The evolution of distributed information processing systems will result in an increasing need for a multiplicity of workstations, servers and specialised processing systems, complicated by the need to integrate existing installed equipment and by manufacturers' evolving product ranges.
- 1.2. The purpose of AWSAP is to provide a coherent architecture for such systems, in order that systems and components from different manufacturers may easily be combined, the levels of interworking significantly increased and new developments more quickly introduced.
- 1.3. By this means a more powerful British IT capability will be generated with increased sales for all the collaborators.

## **2. SCOPE OF PROJECT**

- 2.2. The ASWAP project will define an architecture for distributed information processing systems. The scope is illustrated in the diagram overleaf.
- 2.3. It will prove the architecture by modelling and, with the assistance of the collaborators, by building a demonstration system.
- 2.4. It will adopt or define standards for information interfaces and interconnection conversations, emphasising the integration of voice, image, text and data.
- 2.5. It will be active in achieving international adoption of its standards using its own staff and collaborators' established channels.
- 2.6. It will provide a focus and source of skill and knowledge to carry this architecture into the collaborator companies.
- 2.7. It will seek out and understand the needs of the collaborator companies and take into account and be actively bound by their needs for evolution from existing ranges.
- 2.8. An "all-new-cold-start" for products as opposed to architecture is not practical and is not envisaged.
- 2.9. The project will not design or make products. It will expect to assist in the design of new products and the adapting of collaborators' existing products, providing guidance and expertise to ensure correct interpretation of the architecture.
- 2.10. Particular attention will be given to a Human InterFace (HIFE) architecture which will provide a "family" appearance and a coherent way to access AWSAP facilities but which will be able to be customised to individual company and system needs.

2.11. AWSAP will optimise to an enhanced and advanced OSI-type model. It will provide for connection to major alien systems, e.g. IBM and DEC.

## AWSAP ARCHITECTURE SCOPE



### **3. USE BY COLLABORATORS.**

- 3.1. As the architecture becomes increasingly defined and proven, collaborators may use all or parts of it to adapt existing systems and as a basis for new designs.
- 3.2. It will be used in a spirit of friendly competition. Collaborators will gain benefits from the ability to use products from other members; they will more easily be able to form consortia and to acquire specialised capabilities that they do not possess in house. By using the AWSAP "test house" facility they will be able to prove and demonstrate systems using multiple sourced items.
- 3.3. Collaborators will not be constrained to use particular modules or sub systems such as (for example) the database engine from company "A", or be forced to use product "B" in every system.
- 3.4. Successful transfer of the technology is vital and requires several parallel paths; therefore each collaborator will provide funds, staff for the AWSAP lab, sub contract effort, access to information, help with promotion of standards, a member of the management committee and active internal encouragement for the adoption of the architecture.

### **4. SCOPE OF PROJECT**

- 4.1 The project MUST do the following:
  - define an effective architecture
  - provide generic design and specifications for major components
  - target upon a 1987-1992 timeframe for optimised deliverables
  - understand and accommodate the collaborators' needs in a timely and incremental manner
  - accommodate new and emerging systems - such as inference engines, parallel processors and image processing sub systems
  - interface and information exchange standards for workstations, servers, gateways, bridgers (qv) and HIFE
  - models for partitioning of activities within systems covering the technologies of real time, on line, communications & batch and applications ranging from the office to process control
  - simulate model and produce a representative demonstration of the architecture
  - investigate and model performance, resilience, reliability, privacy and security
  - investigate and define systems management requirements
  - actively promote and establish the architecture and its subsections as international standards
  - demonstrate the ability to bridge, (i.e. convert to AWSAP by means of add-on hardware and/or software). Sample existing (1987 product) systems

- understand and satisfy the needs of other Alvey programs, and provide early definition of, and access to, the necessary interface and interworking standards and conventions
- provide excellent documentation, guidelines and rules describing the architecture, its interpretation and its use
- arrange for the necessary test equipment to be available

#### 4.2 The project MUST NOT:

- produce products
- carry forward an excess of historical design
- involve itself in the design of special processors (with the exception of AWSAP bridgers and HIFE), languages or operating systems
- research topics that merit parallel independent work (such as voice, graphics, 5G processors...)
- invent new standards where an accepted or emerging standard is adequate for 80% of the requirements in the target timeframe
- limit itself by hardware restrictions in an unreal timeframe
- optimise, or take particular steps to enable “high volume/low cost” products
- engage in its own market research

#### 4.3 It is DESIRABLE that the project shall:

- assist collaborators (in a fair-to-all manner) with individual designs
- demonstrate porting of some core applications
- provide a reference system(s) on which collaborators can test or prove systems and components
- provide functional specifications for generic servers and workstations

## 5. STANDARDS

### 5.1 EXAMPLES of the interfaces which MIGHT be generated are:

- information interchange standards
- common Human InterFace base
- bridger hardware/software to adapt “existing-to-AWSAP”
- AWSAP to major operating systems
- AWSAP information bus
- AWSAP to PABX bridge
- voice and image integration
- systems management and security/privacy

5.2 A member of the team will be dedicated to the promotion of AWSAP standards and their international adoption. The collaborators all have established and influential representation on standards bodies and the preferred method will be to use these channels.

## **6. PLAN AND TIMESCALE**

- 6.1. The project should complete its essential “must do” work in two years, with major deliverables in each six month period. These are summarised in section 10.
- 6.2. Many benefits will accrue from continuing the project after the first two years to provide the following on-going services:
  - test house and reference system (ref.4.3)
  - updating of the architecture, which will and must continue to evolve and develop
  - providing the necessary definitive architecture authority
  - acting as a confidential broker and clearing house for requests or needs (“we need an X, is anyone doing one?” or “Would you be interested in talking to another company who has the same idea and the same problem?”)
  - a centre of skills in the application and interpretation of the architecture

## **7. ORGANISATION**

- 7.1. The AWSAP lab will consist of a small, excellent team, located at a site with established technical and industrial IT skills and services, funded jointly by Alvey and the collaborators.
- 7.2. The team will be led by a Project Director and directed technically by a Chief Architect. The former must be technically qualified and experienced in the IT industry. The latter will be an acknowledged expert fully able to carry out the necessary pioneering work. One secretary will be required.
- 7.3. Initially the design team will comprise 4 highly skilled designers, seconded to the AWSAP lab by the collaborators. They will work together closely as one single unit and be exceptionally well supported with computing facilities. This team will increase in size to 8 during the first year.
- 7.4. In the second year the Chief Architect will have the option to expand the design team to around 12-14 to support the demonstration system. This expansion must be rigorously justified to the management committee before approval.
- 7.5. One further person will be dedicated to the promotion of AWSAP standards. He or she will be experienced in such work and politically astute in order to be successful. Finally, one ‘gopher’ will be needed to carry out the various support tasks required by the team.
- 7.6. The total team size therefore will be 9-13 in year one and may rise to 18 in the second year.

- 7.7. Each collaborator and Alvey will provide one member of the management committee. They will provide guidance for the project and also be responsible for ensuring the effort, access to information, support and enthusiasm in their own companies. The Project Director and Chief Architect will be members of the management committee.

## **8. OPERATION**

- 8.1. The AWSAP lab will be responsible for the activities listed in section 4.1. It cannot do all of this itself and to attempt to do so will not lead to successful transfer of the technology into the collaborators.
- 8.2. It will sub-contract a variety of activities to the collaborators, such as design of hardware and software for the demonstration. Collaborators will undertake to provide adequate and timely resource of the correct skills for this purpose. A total of about 20 man years is envisaged, divided between the collaborators.
- 8.3. Collaborators' staff working on sub-contracts will work at their home base, visiting the AWSAP lab regularly. Each visit will be of about one week. The AWSAP lab will provide space and facilities to accommodate them.
- 8.4. The sub-contract-and-visit principle is one of the key factors in achieving the transfer of technology into the collaborators and the generation of the enthusiasm and convergence necessary for success.
- 8.5. The AWSAP team will not do technology or market research. Collaborators will agree to provide the Project Director and Chief Architect with access to the relevant information, on a confidential basis, to enable them to understand the collaborators' needs.
- 8.6. Organisation and selection of the subcontractors will be the responsibility of the Project Director, with the agreement of the management committee. It may be appropriate to place some subcontracts with parties other than collaborators, this may include universities and users.
- 8.7. The AWSAP lab will maintain close links with universities, in particular those involved in the advanced Alvey programme. It will organise workshops when appropriate.
- 8.8. There are many detailed operational issues, including intellectual property rights, which are best left to the Project Director with the help of the management committee.

## 9. COSTS AND MANPOWER>

9.1 Costs and manpower for the first two years are roughly estimated at:

Manpower (AWSAP lab)	27myr @ £30K	£0.8M
Capital	£30K/techman	£0.3M
Rent, comms, etc.	£8K/myr	£0.2M
Demonstration/test system		£0.5M
Sub-contracts for generic work & general travel budget	20myr @ £40K	£0.8M
	TOTAL	<u>£2.6M</u>

9.2 Assuming that there are 10 collaborators, costs for the first two years are:

Alvey contribution to AWSAP lab	£1.3M
Each collaborator's contribution to AWSAP lab	£130K

9.3 Design of specific products will not be Alvey funded. If such products are required for the demonstration, the AWSAP lab will fund their build from the demonstration budget.

## 10. PRINCIPAL DELIVERABLES

10.1 These are:

Month 0:	chief architect, project director, 4 staff, location, funding, management committee
Months 0-6:	detailed plan; architecture overview and philosophy, benefits, sizing and performance targets, sample systems, transition routes, educational plan: infrastructure in place (computers etc.)
Months 7-12:	draft 1 specification for demonstrator, standards and interfaces, first simulation and modelling results, generic specifications (draft 1), first sub-contracts placed, first list of conforming designs, review plans for years 3 & 4
Months 13-18:	modelling and simulation results, standards and interfaces (draft 2), demonstration system in build, report on use of infrastructure
Months 19-24:	formal release of architecture, interfaces, protocols, interpretation and use guides, component specifications, demonstration system working, list of conforming designs

10.2 The project will provide the normal monthly, quarterly and financial reports.

10.3 At the end of the first 12 months there will be a major review and a decision on the plan for years 3 and 4.



## 11. AREAS OF RISK

11.1 The management committee should focus upon the management of the following:

- crisp decision and start-up
- premature convergence on standards
- being overtaken by external events, in particular failure to adopt available standards which will meet most needs, and the emergence of an NIH factor
- pressing for government support of the architecture
- tactical development in the collaborators, causing divergence or deflection of the architecture
- relationships between the Chief Architect and the Project Director
- over dependence upon the chief Architect
- failure by the collaborators to properly market AWSAP

11.2 The technical and commercial risks are considered normal for this type of high technology activity.

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