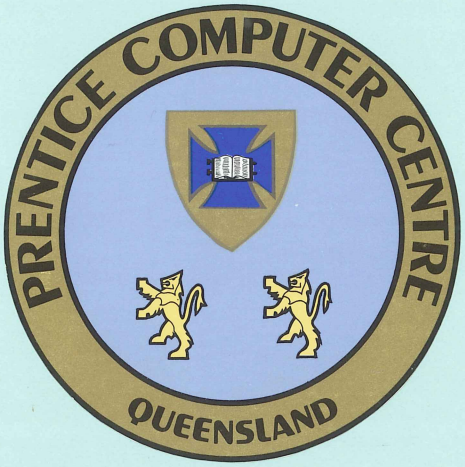

PRENTICE COMPUTER CENTRE

ANNUAL REPORT 1984

PRENTICE COMPUTER CENTRE MANAGEMENT COMMITTEE 1984

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1.0 INTRODUCTION

The Prentice Computer Centre provides support for teaching, research and administration for the University of Queensland and Griffith University. The extensive data communications networks on both campuses are linked by a high speed link operating at 2 million bits/sec. Users of the 1000 terminals connected to the network have access to large mainframe computing power on IBM 3083E, DEC KL10 and DEC VAX 11/780 systems as well as to specialised facilities such as high resolution plotters, high speed and letter quality printers and a photo-typesetter. Sixty smaller computers are installed in the departments of both Universities and most are also connected to the network. Users can also access external networks such as AUSTPAC (Telecom's Australian Data Switched Network), the CSIRO network and through the OTC's MIDAS service to most overseas scientific networks.

2.0 SYSTEMS DEVELOPMENTS

During 1984, 100 user terminals and five remote departmental computer systems were added to the network. Usage of the central facilities (excluding the new IBM computer) increased by 17%. A major constraint on paid usage was the shortage of central computing capacity during first semester. This was relieved by the installation of the IBM 3083E system which replaced the 15-year old DEC KA system. The IBM system was installed on 1 March 1984 and was made available to users on 14 May for a free trial period (involving 140 users) until 1 August when charging commenced. A new and radically different charging system which had regard to the changed ratio of fixed to variable costs was introduced for the IBM system on a trial basis. A fixed monthly charge depending upon the amount of memory and disk storage required for a user kit was applied rather than the charge being based on actual usage. At the end of 1984, there was general agreement that this method of charging should be continued in 1985.

Major software development work was, of course, associated with the implementation of the IBM system. Apart from the generation of the IBM operating system for our environment, there were many programs to be developed to support operational management. A number of applications packages from IBM and other suppliers were evaluated. There was close cooperation between IBM and Centre staff and overall the installation

was achieved effectively and on target.

Nevertheless, there were some disappointments. The release of the IBM implementation of the UNIX* operating system for the IBM 3083E was delayed. Special arrangements were made to meet the needs of the Department of Computer Science for this product in 1985 and work commenced on implementing the Amdahl version of UNIX* on the IBM 3083E.

Apart from the installation of the IBM 3083E system, minor enhancements were also made to existing central computer facilities. An additional 500,000 words of memory were added to the DEC KL10 computer and two additional disk drives, gifted to the University by Digital Equipment Corporation, were added to the KL10. Two new Hewlett Packard Plotters (Models 7585 and 7475) were installed. The public storage area on the VAX 11/780 was increased by 350 million characters. This enabled the introduction of a low priority batch service for research use.

During the year, an additional workstation was installed on the Computervision Computer Aided Design system (CAD/CAM). This system is one of the most advanced of its kind in Australia and the additional station will be used by the Department of Surveying and State Government Departments for a pilot study on Land Use Information. An Electrical Schematic and Printed Circuit Board design facility on the CAD/CAM system was extensively evaluated. As a result, it is planned to offer this design service to departments and Queensland industry in 1985.

Investigations were conducted in the VLSI area to determine the expertise and facilities which would be required to offer support in the teaching, design and fabrication of VLSI Components. Approval was given for a staff member to attend specialised training on VLSI in the USA during 1985.

Special emphasis has been placed on support for remote systems. The software and hardware staff working in this area were brought together in a single group resulting in improved management and a better grade of service to users. As an example, a low cost upgrade strategy for existing remote computers was developed by the Centre. This upgrade permits a 16-fold increase in memory and twice the processing speed while retaining the investment in existing peripherals and software. The first implementation was on the Central Library computer system and four other departmental computers are scheduled for similar upgrading.

The increased interest in personal computers has placed additional demands on the Centre for advice and support. The major emphasis during 1984 has been to provide facilities for personal computers to be connected to the communications network. This enables personal computers to operate as terminals to host computers and transfer files to and from host computers. These services are seen as essential pre-requisites to a rational strategy for the effective use of personal computers in a University environment.

In 1984, the Prentice Computer Centre conducted 110 short courses with a total enrolment of 969, of which 218 attended new courses related to the IBM equipment. These courses, which cover introductory material as well as the use of specialised facilities, are available to staff and postgraduate students of both Universities. They are an important

*UNIX is a Trademark of Bell AT&T

contribution to the effective use of computing resources.

The Centre continued to negotiate contracts with vendors to ensure that the Universities obtain favourable prices and conditions on hardware and software purchases. During 1984, 323 orders to the value of $950,000 were placed on behalf of departments of the University of Queensland and Griffith University.

Systems development and programming services were provided to a wide variety of projects in the teaching and research area. Specialist staff provided assistance to the Library, External Studies and the Administration of Griffith University and University of Queensland. A feasibility study of administrative computing needs was conducted for the Papua New Guinea University of Technology at Lae. Other projects included Lightning Protection, Prawn Breeding Survey, Energy Management and Patient Data Bases. A major revision of systems and programs for the Queensland Tertiary Admissions Centre was commenced. A feasibility study was conducted into an appropriate computer based system to support a major research project of equine blood sampling analysis and recording. This project is now funded and will be commenced in 1985.

The Prentice Computer Centre was registered as a typesetter under the provisions of the Bounty (Book) Act 1969. Use of the typesetting system expanded threefold in 1984 to include not only University publications but also proceedings of major conferences conducted at the University and learned journals.

During 1984, a Systems Analyst and a Computer Engineer from the China Petroleum Planning and Engineering Institute in Beijing were attached to the Prentice Computer Centre for specialist training under the ADAB Technical Assistance Project to assist the Chinese Petroleum Industry.

The Director of the Prentice Computer Centre was elected as National President of the Australian Computer Society for 1984/85. He was also appointed to the Academy of Science National Committee for Scientific Information.

3.0 NETWORK DEVELOPMENT

The data communications network continued to expand both in terms of connections and facilities offered. Circuit switches were installed in the Department of Chemical Engineering and the Department of Mathematics and connected to the Prentice Computer Centre circuit switch by high speed trunks operating at 1.5 million bits/sec.

A special program was installed on the VAX 11/780 to provide file transfer to the IBM 3083E. The new VAX 11/750 installed in the Department of Physics was connected to the high speed campus ETHERNET data communications system operating at effective transfer speeds up to 400,000 bits/sec. This has enabled the department to make use of the

power of the central IBM 3083E for large scale computation. Investigations were commenced into the requirements for a gateway between the Digital DECNET protocols currently used across the network and the IBM (SNA) protocols.

The gateway providing access to Telecom's AUSTPAC service was brought into full production with addressing and charging functions incorporated into the gateway. The introduction of this system also lowered the cost of access by users to overseas networks. Growth in traffic during the year has increased from $80 per month to $800 per month payment for usage to Telecom Australia.

A number of contracts were undertaken for data communications ducting and wiring for existing and new buildings and as a result of relocations. This work covered such departments as Dentistry, Computer Science, Information Office and the Prentice Computer Centre.

The financial result of the Campus Data Network Group for 1984 was satisfactory. Although the surplus of $12,726 fell short of the budgeted surplus for establishment loan repayment of $58,000, there were three invoices totalling $38,000 for work performed in 1984 which had not been brought to account.

4.0 FINANCIAL & OPERATING RESULTS

The financial results for 1984 were satisfactory. Operating costs of $2,242,000 were 3.2% lower than budgeted and revenue of $2,279,000 was 5.2% higher than budgeted. The slight surplus of $37,000 (representing 1.7% of total costs) was significantly better than the budgeted loss of $141,000.

Revenue from usage of central computers rose by 17% in 1984 and revenue from contract programming on behalf of users rose by 39% reflecting a return of staff to revenue earning projects following the diversion of staff to tender evaluation during 1983. Revenue from hardware maintenance rose by 23%.

Salary costs rose from $1,508,000 in 1983 to $1,770,000 in 1984 (18%) and non salary costs rose from $352,000 to $472,000 (34%). Other than inflationary cost increases and incremental creep, the major reason for real cost increases was additional staff and maintenance charges associated with the new IBM 3083E central computer.

Revenue for central computer usage earned from Griffith University Schools and Administration increased by 16% - Schools increased by 13% and Administration by 18%. Revenue from Systems/Programming contracts from Griffith University increased by 27%.

Teaching and Research Departments of the University of Queensland increased expenditure on central computer usage by 17% and Administration by 31%.

Revenue earned from QTAC increased by 69% but revenue from Other External Users fell by 24%.

Funds flowing to the Prentice Computer Centre from the General Funds of the University of Queensland in 1984 represented 1.3% of the total general funds of the University and accounted for 57% of the total cost of operations of the Centre.

In 1978, the Computing Policy Committee recommended that policies should be introduced such that the Teaching and Research proportion of usage of central computing facilities should move from 31% as it was then to 50% by 1982. By 1980/81, Teaching and Research usage had increased to 41% of total usage but since then the relative proportion declined to 26% due to the significant growth of central computer usage by Central Administration. It should be said that the 1978 recommendation did not take into account the significant growth of mini and micro-computers in Teaching and Research Departments and the 1984 statistics do not take into account the trial use of the IBM 3083E in the second semester of 1984. This use suggests that there will be significant growth in large scale computation, particularly for research - an area which was not served well by previous central computing facilities. Such use has been encouraged by a new system of charging implemented on the IBM system whereby users lease kits with charges based on memory and file storage size rather than the amount of usage.

5.0 STAFFING

Approval was given for the staff establishment of the Prentice Computer Centre to be increased by five positions to meet increased workload and to support the new IBM computer system. Careful attention was given to phasing of the filling of new and existing positions to be consistent with financial viability and budget projections. Salary costs in 1984 increased by 18% over 1983 costs.

All labour hours worked by Prentice Computer Centre staff are costed to approximately 300 activities. Centre staff worked 130,000 hours in 1984 and the distribution over major activities in the Centre is as follows:

	%
Executive, Common Services & Overheads	29
Central Computer Operations	22
Software Maintenance	5
Software Development	3
IBM Installation & Development	7
Applications Development & User Training	16
Distributed Computing Support	10
Engineering Services & Communications	8
	100

In 1984, there was a significant concentration of professional staff effort directed towards the installation of the IBM equipment. In 1985, the staff will be redeployed to software maintenance and development.

The staff of the Centre responded to difficult challenges of bringing into operation a new, large and very different computer. They have cooperated to establish a new organisation to support both hardware and software for distributed computer systems. They have met demands for contract programming and systems work which were 39% higher than the previous year. They have increased accessibility to central computer facilities by enhancements in coverage, speed and higher level services of the data communications network. They have provided low cost upgrades for existing departmental computer facilities and supported improvements in the operating systems. The Centre has continued in 1984 to provide enhanced and state-of-the-art computing facilities to the University of Queensland and Griffith University. This would not be possible without professional staff dedicated to providing service.

6.0 CONCLUSION

The achievements during 1984 were significant in the development of computing support for the University of Queensland and Griffith University. The installation of the IBM 3083E computer provided a major upgrade in computing power for scientific computation and has already permitted support for research that was not possible with previous central computing equipment. The new equipment and associated advanced data base software has enabled the Department of Computer Science to establish a new course structure to support the most recent developments in information technology. Data communications network services have been extended to enable appropriate distribution and balance between central, departmental and personal computer facilities. Whilst new innovations are exciting, the extant systems must remain viable and a high standard of reliability was achieved on the DEC system KL10 and VAX 11/780.

The management of these new developments and the growth in workload was achieved within budget resulting in a net surplus of $37,000 for the year's operations.

The Digital Equipment Corporation KA10 Computer installed by the University in 1968 was the first timesharing computer installed in Queensland. It is an appropriate conclusion to this report to record its retirement in December 1984.

Alan W. Coulter
Director

FINANCIAL STATEMENT

PRENTICE COMPUTER CENTRE OPERATIONS ACCOUNT SUMMARY - 1984

REVENUE ($000's)	Budget 1984	Actual 1984
Computer Use:		
Internal University of Qld	980	1104 (2)
Internal Griffith University	150	209
Other Educational Institutions	8	9
External	290	212
CAD/CAM System Use:		
Internal Users	22	-
Others	10	-
Programming & Hardware Services	375	445
Sale of Software	6	-
Cash Sales	7	3
Charge to General Fund for approved services rather than charges to individual users -		
University of Queensland	167	167
Griffith University	23	23
Network Development charged to CDN	27	-
Expected loss transfer to Reserve Fund	141	-
	2206	2172

EXPENDITURE ($000's)	Budget 1984	Actual 1984
Net Salaries (1) (actual salary costs $1,769,847 less Salary Supplementation $106,900)	1727	1663
Maintenance	190	173
Software Charges	73	81
Stationery	49	57
Electricity	77	105
Insurance	17	18
Air Conditioning & Maintenance	23	11
Travel	10	10
Publications	25	8
Rentals	3	-
Magnetic Tapes & Packs	6	8
Furniture & Fittings	6	1
Transfer to Reserve Fund	-	37
	2206	2172

(1) Budget estimates are based on expected December 1983 rates - Award & CPI increases being covered by Salary Supplementation of $106,900 calculated by Bursar's Office.

(2) Includes $14,000 not brought to account in 1983.

Outstanding Debtors 31.12.84 = $59,302 Outstanding Orders 31.12.84 = $91,331

PRENTICE COMPUTER CENTRE OPERATIONS ACCOUNT SUMMARIES - 1980-1984

REVENUE ($000's)

	1980	1981	1982	1983	1984
Computer Usage: (1)					
Internal University of Qld.	622	660	785	896	1104
Internal Griffith University	59	67	100	145	209
Other Educationsl Instit.	15	13	8	10	9
External	164	170	225	265	212
Contracts - User Services & Equipment Maintenance	256	319	315	336	445
Sales of Software	-	5	-	-	-
Cash Sales	8	8	7	7	3
Salary Supplementation	59	138	125	44	107
Charge to General Fund for Approved Services - Univ. of Qld.	41	60	105	116	167
- Griffith Univ.	5	7	10	14	23
Network Development - CDN	-	-	-	13	-
Transfer from Reserve Fund	-	-	-	14	-
	1229	1447	1681	1860	2279

EXPENDITURE ($000's)

	1980	1981	1982	1983	1984
Gross Salaries (2)	1006	1173	1317	1508	1770
Maintenance	86	89	129	173	254
Stationery	45	30	46	51	57
Electricity	38	62	64	73	105
Insurance	10	11	11	12	18
Furniture & Fittings	1	2	2	2	1
Air Conditioning Maint.	12	11	18	10	11
Travel	6	2	10	10	10
Publications	11	30	22	20	8
Rentals	13	6	3	-	-
Magnetic Tapes & Packs	1	1	1	1	8
Transfer to Reserve Fund	-	30	58	-	37
	1229	1447	1681	1860	2279

(1) Low priority terminal rate reduced from 50% to 40% of prime rate from 1.5.80; VAX 11/780 system introduced at 3/4 KL10 charge rates on 17.8.81; KL10 primary memory charges reduced by 15% from 1.2.82; VAX 11/780 charge rates reduced to 1/3rd of KL10 equivalent charges; KL10 primary memory charges reduced by 10% and charge for file I/O reduced by 15% from 1.3.83; introduction of User Kit charging on IBM from 1.8.84.

(2) Actual staff costs including payroll tax, overtime, penalty payments and other staff costs.

REVENUE EARNED 1980 TO 1984 ($000's)

		UNIVERSITY OF QLD			GRIFFITH UNIVERSITY							
	YEAR	ACADEMIC	ADMIN	AFFIL.	ACADEMIC	ADMIN	AFFIL.	OTHER EDUC. INSTITUT.	EXTERNAL	CASH SALES	HARDWARE SUPPORT	TOTAL
COMPUTING AND CASH SALES	1980	291	257	74	37	20	2	15	172	8	-	876
	1981	306	269	85	48	22	9	13	173	8	-	933
	1982	335	351	99	56	39	4	8	226	7	-	1125
	1983	361	450	87	60	72	26	10	265	7	-	1338
	1984	421	590	78	68	85	56	9	212	3	-	1522
CONTRACTS	1980	38	9	88	1	31	2	-	2	-	-	171
	1981	66	3	55	1	34	-	-	46	-	-	205
	1982	60	2	32	2	64	1	1	15	-	-	177
	1983	55	12	8	2	54	49	2	9	-	-	191
	1984	46	61	6	11	60	73	-	8	-	-	265
HARDWARE SUPPORT	1980	-	-	-	-	-	-	-	-	-	85	85
	1981	-	-	-	-	-	-	-	-	-	114	114
	1982	-	-	-	-	-	-	-	-	-	138	138
	1983	-	-	-	-	-	-	-	-	-	146	146
	1984	-	-	-	-	-	-	-	-	-	179	179
TOTAL	1980	329	266	162	38	51	4	15	174	8	85	1132
	1981	372	272	140	49	56	9	13	219	8	114	1252
	1982	395	353	131	58	103	5	9	241	7	138	1440
	1983	416	462	95	62	126	75	12	274	7	146	1675
	1984	467	651	84	79	145	129	9	220	3	179	1966

Notes:
1. Figures refer to revenue earned during the year. There may be variations between these and revenue brought to account in expenditure and revenue statements.
2. Figures do not represent relative work load on computers due to variations in use of priorities, changes to charge rates and charge factors for different classes of users. External users are charged at 3.6 times the internal rate and other educational institutions at 1.7 times the internal rate.
3. UQ Affiliated figures for 1982 includes $64,000 for QTAC, whilst QTAC revenue of $73,000 for 1983 and $123,000 for 1984 is included with Griffith University Affiliated figures.

PRENTICE COMPUTER CENTRE

PROPORTION OF USAGE CENTRAL COMPUTING FACILITIES

	1981		1982		1983		1984	
	USAGE %	JOBS %	USAGE %	JOBS %	USAGE %	JOBS %	USAGE %	JOBS %
UNIVERSITY OF QUEENSLAND								
Teaching & Research Depts.	41	65	37	64	29	60	26	53
Administration	32	8	39	9	43	10	51	10
* Affiliated	10	5	9	4	6	6	5	6
GRIFFITH UNIVERSITY								
Schools	6	12	6	12	6	12	5	13
Administration	4	1	4	3	7	4	6	11
* QTAC	-	-	-	-	4	1	4	1
OTHER APPROVED USERS	6	7	5	8	5	7	3	6
	100	100	100	100	100	100	100	100

(Note - Usage refers to central computing only and does not include mini-computers established in Departments of the University)

* QTAC included with the University of Queensland Affiliated Group prior to 1983