



Department of Education,
Training and Youth Affairs

Activity Based Costing

A Study to develop a costing
methodology for Library and
Information Technology Activities for the
Australian Higher Education Sector

Information and Education Services Division
The University of Newcastle

April 2001

Higher Education Division

Activity Based Costing

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1. EXECUTIVE SUMMARY

During the first half of 2000, the Information and Education Services Division of the University of Newcastle undertook an activity based costing (ABC) study into its library and IT services. The study followed the methodology and objectives of the DETYA-sponsored study to develop a costing methodology for the Australian Higher Education Sector, the final report of which was released in May 2000, concurrent with the completion of this study.

The Information and Education Services Division (IESD) of the University of Newcastle has responsibility for the delivery of library and IT services to all faculties and divisions of the University. Some organisational units within the University retain responsibility for a small proportion of IT services, and these costs were omitted from the study.

The study was not undertaken by the Division as an accounting process, but rather as a strategic exercise that can provide information and feedback on activities to inform decision making and planning. The Division saw its potential as a cost management strategy, to assist in setting of goals and tracking progress towards their attainment in an environment of intensifying competition and resource constraint, both internally and externally.

As this Report highlights in the discussion and recommendation sections, the framework and systems for studying costs through such methodologies as ABC should continuously be challenged to ensure relevance in the data and activities, and that the overall focus is informed as strategies change to meet competitive pressures and opportunities. ABC can assist managers and staff to better understand their actions and decisions by focusing attention on those activities that help them achieve their goals, through a structured and methodical process.

The study offered the opportunity for managers within the Division to approach cost management and budgeting from an alternative strategy to that which normally prevails within universities, generally involving financial performance measurement by comparing actual and budgeted results. ABC offered an approach that could inform management of the actual costs of the services they provide, how these costs might vary with changes in demand from client groups, the cost of different student types enrolled, or the unit cost of providing particular services in comparison to other universities or providers.

Among the primary objectives of this study was the opportunity it presented for Divisional staff to be trained and exposed to cost management methodologies. This experience will be used to inform future studies of this type within the Division and more broadly across the higher education sector through strategic partnerships.

This Report identifies a total of 37 recommendations for consideration by the IESD Executive and Management Team. Some of these relate to future ABC studies, while others identify the need for improved data collection and monitoring within particular activities. A further group of recommendations question some of the underlying assumptions and approaches to the provision of services within the Division, and provide the basis for critical follow up within Programs.

Encouragingly, several areas of the Division have already taken the information and data identified within the study and used it as the basis to review or evaluate activities or particular approaches within the Program, and several of the recommendations reflect these initiatives.

While potential for improvement has been identified with respect to any future ABC studies and much still remains to be addressed, this Report provides the basis for the Division to engage in critical evaluation of its library and IT activities, the costs which make up those activities, and the decisions and preferences of clients which have the capacity to impact upon those costs within the Division.

Activity Based Costing

The true value of the investment in this study is therefore still to be extracted by the Division.

2. PROJECT BACKGROUND

2.1 Background

The Information and Education Services Division (IESD) at the University of Newcastle has for some time been interested in mechanisms to better link its planning and budgeting processes and to identify more reliable methods for tracking the costs of its activities. Without adequate cost information it is difficult to plan appropriately, justify resource requests or service charges, or assess efficiency.

Recently, consultants Ernst & Young were commissioned by DETYA to undertake an Activity-Based Costing (ABC) project across specific functions in several universities.¹ The DETYA-Ernst & Young project did not examine the costs of library or IT activities. Consequently, the University of Newcastle embarked upon an activity based costing project with Ernst & Young, with a specific focus upon library and IT services. These particular services are delivered at the University through the Information and Education Services Division. The project implementation followed the methodology developed through the DETYA study.

The project provided an opportunity to build upon the model and knowledge developed in the DETYA study, with specific interest in library and IT areas for the broader benefit of the sector. The objectives of the project therefore included the development of a model that would have a sector-wide applicability requiring minimal future development or adaptation.

2.2 Activity Based Costing as a Tool for Management

ABC provides a methodology for understanding the costs of activities, products, services and customers and for providing feedback and insights on what causes costs. It can assist organisations in planning and making service choices in an environment of limited resources and increasing demands. It can also provide a sound framework for continuous improvement.

For the Information and Education Services Division and specifically its IT and library services, benefits of the ABC study were seen as assisting the Division to:

- make informed decisions based upon reliable data
- make valid responses to queries and questions regarding its services
- benchmark its services across the sector
- provide value in analysis of activities in terms of quality and continuous improvement
- provide feedback and insights to management in what causes costs
- facilitate strategic planning
- evaluate processes and activity effectiveness and efficiency

2.3 About the Information and Education Services Division

At beginning of this new century, there is widespread recognition that the world is changing. Higher education provision is one area facing unprecedented challenges. In *Learning for Life*, the final report of the Review Committee on Higher Education

¹ Report released, May 2000, "A Study to Develop a Costing Methodology for the Australian Higher Education Sector", published by DETYA.

Financing and Policy, Roderick West recognised that the “digital revolution” was one development that would “fundamentally change” higher education institutions in Australia and worldwide.

The development of the Internet and the World Wide Web create enormous opportunities as well as challenges in an environment where Government funding for universities is reducing. The West report also recognised an increase in student expectations for better outcomes from their education and for products that are tailored to their needs. Increasing competition between education providers both within the university sector and outside it, nationally and internationally is another challenge for individual institutions and their staff.

In response to this rapidly changing environment, the University of Newcastle formed, early in 1998, a new division, the Information and Education Services Division (IESD). Formed by the merger of the Library, the Information Technology Division, the Centre for the Advancement of Learning and Teaching (CALT), Classroom and Theatre Services and the Medical Communication Unit. IESD provides the Divisional framework that will allow the University to pursue the opportunities presented by these changes, as well as responding positively to the challenges. IESD heralds a new approach to the provision of information technology, information delivery and the support of teaching and learning, that will enable it to achieve its strategic objectives in partnership with the broader University community.

The Division comprises six operating Programs and two specialised units. Specifically, the Programs are:

- Client Services
- Information Resources
- IT Infrastructure
- Information Systems
- Learning and Development
- Media Design, Production and Publications.

The two specialised units are:

- Survey and Evaluation Services
- Web Development Team.

As the focus of this study was on library and IT activities, not all of the Division was included.

Media Design, Production and Publications Program and the Surveys and Evaluation Services Unit were not included in the study, and only the IT Training role within the Learning and Development Program was included.

3. PROJECT OBJECTIVES AND SCOPE

3.1 Project Objectives

The primary objectives of this project were to:

- Determine the total cost of all activities and resources associated with the performance of library and information technology activities provided by the Information and Education Services Division (IESD) across the University of Newcastle;
- Evaluate and test the appropriateness of the Activity-Based Costing methodology to library and IT activities within a university environment as a possible precursor to its further development and use as a methodology for the university sector;
- Gain a better understanding of the area of indirect overhead costs, and how they might be appropriately assigned to library and information technology activities;
- Gain a better understanding of the area of indirect non-salary costs, and how they might be appropriately assigned to library and information technology activities;
- Familiarise and up-skill University staff in activity based costing, and design and use of the ABC model.

The first objective of the project was the review of costs associated with library and information technology activities conducted across the University by the Information and Education Services Division. Some information technology activities provided by IESD are also supported by one or two faculties within the University, meaning that not all costs associated with delivering IT activities within the University would be collected during the study.

The second objective was to evaluate the appropriateness of the Activity Based Costing methodology to library and information technology activities within the Higher Education sector. While Activity Based Costing is a well recognised methodology for determining accurate product costs in a commercial context, it has not traditionally been considered within a university context. A principal component of this second objective was the generation of the activities dictionary and identification of appropriate activity drivers which could form the basis not only for this study, but subsequently provide a benchmark for use of the model across the higher education sector.

The third objective was to gain a better understanding of the University's indirect overheads and how these might be assigned to organisational units. In particular, the study sought to identify a suitable distribution methodology for indirect costs, but also to identify areas where the particular functions of library and information technology influence indirect overhead costs. An example of the latter is insurance or depreciation costs based upon the value of the University book collection.

The fourth objective was to gain a better understanding of the indirect non-salary costs within library and information technology activities and how these might appropriately be identified and assigned to particular activities.

The final objective involved Ernst & Young in a facilitation and mentoring role with University staff, ensuring that skills in the implementation and development of an ABC model were developed within the University, to better assist future internal or external replication of the model processes, and its ongoing deployment in benchmarking and continuous improvement of library and IT services.

3.2 Project Scope

This trial study at the University of Newcastle, focused on examining the library and information technology activities of the institution provided by the Information and Education Services Division. Additional library and IT services are provided at the University's Central Coast Campus, a joint TAFE-university institution at Ourimbah on the Central Coast of NSW. Information technology and library activities at the Central Coast Campus were excluded from the scope of the project.

Library and Information Technology services provided by IESD, and within the scope of the study, included services provided on the principal Newcastle campus at Callaghan, and services for the central city locations at University House and the Conservatorium of Music. Specific IT and library costs are also incurred in supporting university functions within several regional hospitals and health care locations, and where appropriate, these were included in the study.

Some faculties within the University, primarily Engineering and Science and Mathematics, take responsibility to support a limited range of information technology activities from within their own resources. While some IT costs therefore cut across functional boundaries within the organisation and are as a consequence perhaps hidden within traditional or other accounting classifications, the total of these non-IESD costs was determined not to be of significance to the outcomes of the study or development of the model. Any faculty-based costs associated with these activities have therefore not been included within the model. Where relevant, activity driver data collected in the study reflects (by omission or other bases) the faculty-based nature of particular activities and this ultimately is reflected in the cost object data.

The Information and Education Services Division supports a broader range of activities within the University than library or IT, although these two areas represent the greater proportion of the Division's activity. Non library or IT areas and their staff and activities have thus been excluded from the study and all costs associated with these, likewise, have been excluded from the model.

The Division comprises six operating Programs and two specialised units. Specifically, the Programs are:

- Client Services
- Information Resources
- IT Infrastructure
- Information Systems
- Learning and Development
- Media Design, Production and Publications.

The two specialised units are:

- Survey and Evaluation Services
- Web Development Team.

As the focus of this study was on library and IT activities, not all of the Division was included. Media Design, Production and Publications Program and the Surveys and Evaluation Services Unit were not included in the study, and only the IT Training role within the Learning and Development Program was included.

4. PROJECT APPROACH

4.1 Implementation and Timeframe

In consultation with the principal consultant from Ernst & Young, a small project team was selected from within the Division to work with Ernst & Young on the project implementation. The study was planned to occur over a 6-week period, commencing in February 2000, with the final project report being available at the end of March 2000.

The project commenced on Monday 31st January 2000 and concluded on 30th April 2000. The Internal Final Report was published in May 2000. The project examined the costs of information technology and library activities delivered across the University by the Information and Education Services Division for the year 1999. Cost driver information was collected for the same period.

The principal ownership and responsibility for the study and this report rested with the University Project Manager, and the consultant's role was one of guidance and support.

4.2 Planning

Planning for the pilot study identified that a standard set of activities undertaken within the Information Technology and Library areas of The University of Newcastle would be selected. It was anticipated that the number of activities identified would not exceed 100. With respect to cost objects it was intended that attribution of the activity costs would be down to the division and faculty level.

At a workshop involving members of the Project Steering Committee as well as managers from within the relevant activity areas of IESD, basic principles underlying the conduct and focus of the project were agreed. This included the definition of cost objects for the study and confirmation of the scope of the study.

4.3 Definition of Cost Objects

Cost Objects for the study were defined at a meeting of the Steering Committee and Project Team at the beginning of the project. The following cost objects were agreed upon:

Faculties of the University (excluding the Faculty of the Central Coast):

- Architecture, Building & Design
- Arts & Social Science
- Economics & Commerce
- Education
- Engineering
- Law
- Medicine & Health Sciences
- Music
- Nursing
- Science & Mathematics

Divisions of the University:

- External Relations Division
- Finance & Property Division
- Information & Education Services Division (the primary focus of the study)
- Research Division
- Student & Academic Services Division

Other

- External (representing clients external of the University organisation, such as strategic partners).

Students:

- Undergraduate
- Post graduate – research
- Post graduate – coursework
- International

Other Internal:

- Internal (representing costs which could not directly be attributed or linked back to a faculty or division of the University organisation)

During the analysis phase of the study and utilising cost driver data gathered, it became evident that the majority of data related back to operational units, being either faculties or divisions, rather than student types. Cost driver data was therefore identified and collected to permit allocation to faculties and divisions as cost objects, with students being subsequently deleted as Cost Objects. Consolidation of all cost driver data within a consistent cost object framework also provided the study with meaningful outcomes in terms of cost object information at a consistent level.

4.4 Review of Financial Data

Financial data included in the Model (Resource Module) required the Project Team to identify all the resources consumed in the delivery of IT and library activities within the Division (general ledger dollars, people and salaries, depreciation costs, utility costs, etc). The focus was for the calendar year 1999 and data was obtained from the following sources:

- Finance One System (General Ledger information on costs)
- Concept System (Salaries and staffing information)
- 1999 Institutional Annual Report (depreciation information)

4.5 Activity Identification and Definitions

Information Technology and Library activities performed by IESD across the University were identified and defined through a series of workshops and discussions with relevant University staff within the areas, and confirmed through workshops and meetings of the Steering Committee. Staff from the following Programs or operational units in IESD were involved in these sessions: Information Resources, Client Services, IT Infrastructure, Information Systems, Learning and Development, Web Development Team, the IESD Executive and Administration.

Activities and their definitions were validated through an iterative process with the Program and Unit Managers and their staff. The Project Team held face to face meetings with senior staff within each functional area, with the results of these meetings being communicated back into the area and subsequently back to the Project Team (please refer to Appendix B for a list of people interviewed directly during this process).

A total of 83 activities were identified during the study, with 29 being clearly identified as library related, 39 as IT related, 3 as generic activities (such as Strategic Planning, Policy Development and so forth) and 4 as 'integrated' services, reflecting the integrated nature of IT and library services within the Division. A further five services

were identified within the study, as being ones which are relatively specialised, or reflect the need to create an activity to contain certain overhead costs, such as depreciation. A full list of the activities and their definitions is included in the Activity Dictionary (please refer to Appendix C).

Table 1 – Activity Identification & Definitions

IT	Library
<ul style="list-style-type: none"> • • Resolving computer problems • Planning, management and implementation of significant software installations • Deployment and provision of software • Advising clients on use of hardware and software • Managing desktop computer standards • Scheduling Computer Lab Use • Managing Computer Labs • Participate in evaluation and implementation of packaged software solutions • Maintain and support packaged corporate systems • Analyse, design and develop in-house corporate information systems • Maintain and support in-house corporate information systems • Evaluate and implement ad hoc reporting tools for desktops • Maintaining central computing infrastructure • Maintaining computer labs • Developing computer labs • Installing and maintaining telephone connections • Providing telephone directory services • Managing telephone system operations • Developing telephone systems • Maintaining telephone systems • Installing and maintaining data network connections • Managing data network operations • Maintaining the data network • Developing the data network • Year 2000 Project • Maintaining administration systems • Implementing HR system • Operational - IT only • 	<ul style="list-style-type: none"> • • Providing access to library collections • Lending short loans • Lending equipment • Maintaining library systems • Cataloguing – Copy • Cataloguing – Original • Answering lending enquiries • Binding – monographs & serials • Accessioning and end processing information resources • Ordering information resources • Processing short loans • Processing returns • Lending information resources – self check • Lending information resources – over the counter • Processing information resources - renewals • Processing information resources – self renewals • Shelving information resources • Lending information resources – over the counter • Processing information resources - renewals • Processing information resources – self renewals • Providing inter library services - incoming • Providing inter library services – outgoing • Receiving and paying for information resources • Maintain, process and provide access to research archives • Maintain, process and provide access to rare books and special collections • Planning and delivery of orientation and generic information skills programs • Delivering of curriculum based information skills programs • Selecting and evaluation of new and continuing information resources • Managing access to electronic information resources. •

Facilities-Related Activity	
<ul style="list-style-type: none"> ▪ Providing access to IT facilities 	<ul style="list-style-type: none"> ▪ Providing access to library buildings
Integrated Across-Division Activities	
<ul style="list-style-type: none"> ▪ Evaluating Divisional Services ▪ Providing and implementing a AQ framework ▪ Student photocopying ▪ Planning, policy and development 	<ul style="list-style-type: none"> ▪ Providing a referral service for IED ▪ Preparing Strategic Plans and Budgets ▪ Supporting Strategic Partners
Other Activities	
Non-Library or IT-Related	
<ul style="list-style-type: none"> ▪ Maintain, process and provide access to University archives 	

4.6 Activity Driver Identification

Activity Drivers were identified by the Project Team in close consultation with the relevant staff in each area. The Activity Drivers were validated by the Program Managers responsible for specific activities in the library and IT areas. A full list of Activity Drivers is included in Appendix D.

4.7 Collection of Activity Driver Data

Activity Driver data represents the individual instances or ‘events’ particular to each activity and which should provide an indication of what makes the overall activity cost rise or fall. An example would be the number of telephone connections in any one-year, or the number of information resource items loaned.

Activity Driver data was collected from a range of sources, depending upon the activity. In some instances, Activity Driver data was not available for the full calendar year 1999, and was extrapolated from sample data for part of the year. For activities where it was not possible to identify specific Activity Driver data, or where none was available for 1999, distribution to Cost Objects was based upon selected University-wide data. Assumptions underlying these decisions are contained in the Model and listed in Appendix E.

4.8 Development of the Resource Module and Identification of the Resource Drivers

The Project Team designed a Resource Module structure that was consistent with the University Organisational Structure and categories within the General Ledger. Costs for specific resources were identified within the General Ledger and entered into the Resource Module structure. These included both direct and indirect costs. Resource Drivers as represented by the Level of Effort were identified and entered into the Module, providing the basis for allocation of all salary costs and salary on-costs. Determination of the number of full-time equivalents (FTE’s) per Activity flowed from this process and provided the basis for allocation of non-salary costs to Activities.

Level of Effort data represents the apportionment of individual staff time across specific activities, to 100% of their time. Level of Effort was determined within each Program area by the Program Manager and staff, and confirmed in workshops with the Project Team.

Resource costs entered into the Resource Module at the Resource Centre level, at the initial stage, were based upon the General Ledger accounts for each Program or Unit covered by the Pilot Study, and included salary and non-salary costs within the accounts. Salary on-costs were rolled up into the total salary cost.

The Conceptual Model was confirmed throughout the project through consultations with the relevant Program and Unit Managers, with the Director of the Financial Services Unit, and through constant validation back against the General Ledger.

4.9 Development of the ABC model

The ABC model was created using EasyABC Plus software for Windows and following the Cost Flow Conceptual Model. Development followed an iterative process with constant feedback and validation of activities, activity and resource data and assumptions with the relevant Program Managers and staff in each area.

4.10 ABC Model Reports

ABC Model reports were produced and validated with management across the areas of the study.

4.11 ABC Study Project Report

A Final Draft of the ABC Pilot Study Report was provided to the Steering Committee members for their comment. A Final Report was subsequently produced by the Project Team incorporating the feedback from the Steering Committee and key staff within the library and IT areas of IESD.

5. ABC MODEL DESIGN AND STRUCTURE

5.1 Model Overview

The ABC Model was built using EasyABC Plus software. The model consists of three modules:

- i. The Resource Module;
- ii. The Activity Module; and
- iii. The Cost Object Module

Cost data is entered into the Resource Module and assigned to the Activity Module through Resource Drivers. Activity costs are then assigned to cost objects through Activity Drivers.

EasyABC follows a hierarchical structure where costs are grouped together within each of the above modules as:

- 'Centres' Centres contain groups of accounts that represent a common cost, process or cost object, such as a department or program;
- 'Accounts' Accounts contain the costs of resources (i.e. the general ledger costs), activities and cost objects, and;
- 'Cost Elements' Cost Elements contain specific costs for accounts.

Costs within accounts can be 'rolled up' to derive the cost of the parent centre, such as the Program. The cost of each activity account and the cost elements of each activity can be seen within the model.

5.2 Resource Module

5.2.1 Resource Module Structure

The Resource Module contains the total University resources (costs) consumed in undertaking IT and Library activities within the University, as provided through the Information and Education Services Division (IESD).

The Resource Module contains the Non-Salary and Salary resources (costs) consumed within each of the Cost Centres. Salaries costs have been grouped under Direct Costs, along with Non-Salary costs. Costs sitting outside the Cost Centre and Program budget control have been grouped under Indirect Costs. This category includes costs within the University's Central Fund, such as power and lighting, insurance and so on.

5.2.2 Resource Centres

The Resource Module consists of twelve main Resource Centres, being:

- **Information Resources**

Contains the Salary and Non-Salary costs consumed within the Information Resources Program.

- **Client Services**
Contains the Salary and Non-Salary costs consumed within the Client Services Program.
- **Infrastructure Services**
Contains the Salary and Non-Salary costs consumed within the IT Infrastructure Program.
- **IT Training**
Contains the Salary and Non-Salary costs consumed within the Learning & Development Program, in provision of IT Training activities only.
- **Information Systems**
Contains the Salary and Non-Salary costs consumed within the Information Systems Program.
- **Web Team**
Contains the Salary and Non-Salary costs consumed within the Web Development Team.
- **Administration Support**
Contains the Salary and Non-Salary costs consumed within the Executive and Administrative functions of IESD
- **Infrastructure Development**
Contains the Project and Non-Salary costs consumed in implementing the IT Infrastructure Development Plan.
- **Gardiner Library**
Contains the costs in direct support of library activities provided by the Gardiner Library (Hunter Health) to the University.
- **Information Technology**
Contains the overhead costs in providing and maintaining buildings used and occupied by IT services.
- **Library**
Contains the overhead costs in providing and maintaining buildings used and occupied by the libraries.

5.2.3 Resource Module Data

The cost information contained within the Resource Module is based on figures within the 1999 General Ledger accounts (excluding recoveries account 999) for the year 1 January 1999 to 31 December 1999. The following table illustrates the source of the cost data found within the Resource Module:

Table 2 - The source of the cost data found within the Resource Module

Resource Cost	Source
Salaries & salary on-costs data	CONCEPT System
Non-salary direct costs data	Finance One System
Central funds (indirect costs) data	1999 Annual Report
Building occupancy information	Institutional Building File

These costs were adjusted, where relevant, to ensure they accurately reflected the costs incurred by the University during 1999 on IT and Library activities provided by IESD.

The model was continually balanced back against the 1999 General Ledger Reports to ensure its validity.

5.3 Resource Drivers

Costs within the Resource Module are assigned to Activities within the Activity Module using a Resource Driver. Resource Drivers were identified by the Project Team in consultation with Program Managers and staff in each area, to reflect a logical and quantifiable relationship between the resource and its associated activity(ies). The following drivers have been used to allocate costs from the Resource Module to the Activity Module:

- Level of Effort - % (LOE) - used to allocate salary costs to activities
- Number of FTEs (per activity) - used to allocate non-salary costs to activities

Number of FTEs per activity was used to allocate non-salary costs where no information linking a specific non-salary cost was available to allocate the cost direct to a particular activity. In instances where substantial non-salary costs were identified and could be allocated directly, this was done and is identifiable within the Model.

Workshops and interviews were conducted with a significant number of staff across the Division involved in library or IT activities in order to obtain the driver quantities and confirm the level of effort data.

Staff were requested to review the activity lists generated through the Activity workshops and consultations, add any additional tasks to the activity dictionary where appropriate and record the percentage of time they spent performing an activity (i.e. the percentage of time spent by an individual within a particular activity during the 1999 calendar year).

5.4 Activity Module

The Activity Module contains the activities of a library or IT nature performed across the University by IESD and the cost associated with them.

5.4.1 Activity Module Structure

The Activity Module groups the University's IT and library activities within an Activity Centre structure which parallels that of the Division:

- Information Resources program
- Client Services program
- IT Infrastructure program
- Information Systems program
- Learning and Development program (IT training activity only)
- Web Development Team
- IESD Executive and Administrative functions
- Other Activity Centres, generally not representing direct IESD costs.

All activities within the Activity Dictionary (Appendix C) can be found within the appropriate Activity Centre.

5.4.2 Activity Module Data

The activities found within the Model were identified through a series of workshops with relevant staff. An Activity Dictionary was developed from the interactions with library and IT staff. The Activity Dictionary was validated through a process of iteration with Program Managers and other senior staff, during the development and refinement of the model.

The cost of individual activities were derived by the Model through an assignment of costs from the Resource Module using Resource Driver data. A list of activities within the Model is included in Appendix C: Activity Dictionary. During the Project, it was noticed that certain resources (costs) within IESD were only partially consumed by IT or library activities, or not at all. The portion of those resources not consumed by IT or library activities was either deducted from the Resources data (costs) entered into the Resources Module (assumptions underlying this are included in the model), or were allocated against non-IT or library activities.

Activities within the ABC Model constitute a high level overview of the main IT and Library activities performed within the University by IESD. However this does not constitute an exhaustive list of the activities of the Information and Education Services Division of the University, or of the totality of IT or library activities performed across the University by organisational units other than IESD.

Future studies could provide more detailed information regarding total activity costs for all IT or library activities.

5.5 Activity Drivers

Activity costs are assigned to Cost Objects based on logical and quantifiable relationships between the activity and the Cost Object.

For example, the activity "Maintaining and Supporting Packaged Corporate Systems" (performed by Information Systems staff) is only assigned to organisational units (Cost Objects) who request assistance with specific systems. The Activity Driver utilised to assign the activity cost is the number of support calls (per Faculty or Division). This is based on the principle that the greater the number of support calls provided per Division or Faculty, the larger the proportion of the activity cost will be incurred by that Division or Faculty.

The Activity Drivers are detailed in Appendix D.

The particular Activity Drivers as identified may not always be the most appropriate drivers to assign activity costs to Cost Objects, however they have been used in the absence of other, more relevant drivers. Additional driver data should be identified in future studies, as more detailed activity studies are performed.

5.6 Cost Objects

The Cost Object module contains information about the Academic Faculties and Divisions within the University. As with the other modules, it should be noted that the level of detail within the Cost Object Module has been determined by the objective of the model. As part of the planning process, it was decided that within this particular model, the lowest level of detail for Cost Objects would be the individual Faculties and Divisions. However, in future models, the detail can, if appropriate, be as elaborate as the user or the need indicates.

5.6.1 Cost Object Structure

The Cost Object Module groups the University's Faculties and Divisions consistent with the organisational structure. There are several exceptions, which reflect external cost objects, such as strategic partner organisations of the University, or groupings which enabled non-assignable costs to be separately identified, such as the strategic planning and budgeting activities of the Division.

5.6.2 Cost Object Data

Cost Objects were defined by the Project Team and Project Steering Committee in a workshop at the beginning of the project. Cost Objects costs were derived by the Model through the assignment of costs from the Activity Module using Activity Drivers.

5.7 ABC Model Reporting

The Model generates a vast array of reports, providing detail by Activity, by Resource Centre (i.e. Program), by Cost Object, or by Resources, such as level of effort for each different category of staff (HEW level).

An example of the type of reports that can be generated to summarise the cost of IT or library activities provided by IESD across the University is shown in the table below (note that not all IT activities are included in this report).

Table 3 - An example of a report that can be generated to summarise the cost of IT or library activities

Information Systems	\$xxx
IS 1 - Participates in evaluation & implementation packaged solutions	xxx
IS 2 - Maintaining & supporting packaged corporate systems	xxx
IS 3 - Analysing, design & developing in-house corporate information solutions	xxx
IS 4 - Maintaining & supporting in-house corporate info solutions	xxx
IS 6 - Evaluate & Implement ad hoc reporting tools for d/tops	xxx
IS 7 - Monitor & plan for growth of all corporate info systems	xxx

Table 4 – Program Activity Report (Extract only)

Infrastructure Services	xxx
Providing user support for presentation facilities	xxx
Maintaining presentation facilities	xxx
Developing presentation facilities	xxx
Maintaining specialised electronic equipment	xxx
Creating & maintaining user accounts	xxx
Managing central computer infrastructure operations	xxx
Developing central computing infrastructure	xxx
Maintaining central computing infrastructure	xxx

The following is an example of the type of report that can be generated to summarise the total resource value of IT and Library activities consumed by a Faculty or Division (or Cost Object).

Table 5 - Resource consumption by a Faculty (Extract only)

Faculty of XXX	
Providing user support for presentation facilities	xxx
Maintaining presentation facilities	xxx
Developing presentation facilities	xxx
Maintaining specialised electronic equipment	xxx
Creating & maintaining user accounts	xxx
Managing central computer infrastructure operations	xxx

6. KEY MODEL RESULTS

6.1 Information Resources

The major consumers of Information Resources activities were broadly identified as Faculty/Division or by student group. The cost object for purchasing Information Resources can be attributed to a Faculty as the Program is able to measure expenditure at the Faculty level, while the cost object for Lending Services can be attributed both to student groups and Faculty as the INNOPAC system generally tracks activity at both levels. It should be noted that the Program was unable to provide student activity data for overseas students as they are allocated to a Faculty and thus embedded in Faculty totals. Similarly, students enrolled at the Central Coast campus are allocated Callaghan Faculty codes, therefore circulation activity could not be separated for the Central Coast Faculty.

Overall, the Program's Management Team found that the Activity Based Costing process was an informative and valuable exercise that has highlighted areas for future review. Although there was some concern about the accuracy of the data and the limited time available in which to conduct the exercise, the results will inform future decision making processes and strategic directions. The Program would also welcome the opportunity to examine ABC data from other University Libraries or benchmark operations to ascertain whether our costs are within industry standards or emulate best practice.

Level of effort methodology:

This process was used to determine the distribution of staff time and hence salaries, against activities. This varied from one section of the Program to another. In Bibliographic Services, level of effort was determined on the basis of the estimated amount of time spent by staff individually assigned to various activities, in accordance with their position statements.

In Lending Services, rosters were used to estimate the amount of time allocated to specific service points e.g. Short Loans. However, as some of the activities could not be allocated by roster, staff members were asked to give an estimate of their time spent on a particular activity, and this was reviewed by the Program Management Team to ensure consistency.

6.1.1 Integrated Services with Client Services Program

The Information Resources and Client Services Programs undertake several activities which overlap at various locations within the University. Most directly, this occurs at service points in the specialist libraries for Law, Medicine, Curriculum and Audiovisual, and at the city campus library at University House (the Conservatorium of Music library). Staff and other costs identified within Client Services associated with these activities, have been incorporated into the activities within the Information Resource Program's cost module. The total proportion in costs incurred within the Client Services Program is embedded in these activities, being less than 5% of the Program's total activity.

6.1.2 Cataloguing Services

The two primary cataloguing activities within the Program – original and copy cataloguing, were assumed to represent 10 and 90 percent of the total number of items catalogued respectively. Total cataloguing costs estimated by the model were considerable. Salary costs were significant in both these activities (original

and copy cataloguing), with copy cataloguing consuming slightly more resources than original cataloguing.

Total costs were distributed as follows:

Table 6 – Total costs of cataloguing services

Activity	Cost per Item \$	Total Cost \$
Original cataloguing of 2,115 items	xxx	xxx
Copy cataloguing of 18,031 items	xxx	xxx

Costs for Kinetica were distributed within the model proportionately across the Program’s activity, rather than directly against those activities which use this service: cataloguing, inter-library loans, and reference support (the latter supported by Client Services).

Using a broad assumption that Kinetica costs could be evenly apportioned across all three of these activities, the cost per item catalogued would increase by approximately \$xxx, producing the following outcome:

Table 7 – Cost per catalogued item (inclusive of Kinetica)

Activity	Cost per Item \$	Total Cost \$
Original cataloguing of 2,115 items	xxx	xxx
Copy cataloguing of 18,031 items	xxx	xxx

Total costs for cataloguing under this scenario might therefore more accurately be estimated at \$xxx, as against the total of \$xxx generated within the model.

The cost of the original and copy cataloguing activities are much higher than the Program’s assumptions, or charges for in-sourced work from other libraries.

The Program also expressed concern about the accuracy of the assumption that 10% of the items catalogued were original. Nonetheless, this assumption was necessary given the inability to obtain accurate statistical data from Kinetica. Manual statistics are now being collected to separate these activities and these will more accurately inform future ABC studies. It should also be noted that the costs for cataloguing activity would also include catalogue maintenance and authority work.

6.1.3 Short loans

Two activities were identified: **processing** and **lending** short loans. These activities also incorporated short loan activity undertaken by the Client Services program at the Huxley, Music and other specialist libraries. The number of loans includes in-house usage. Costs of the short loans activity were:

Table 8 – Costs of short loans activity

Activity	Cost per item \$	Total Cost \$
Processing 19,864 items placed in Short Loans	xxx	xxx
Lending 219,729 Short Loans	xxx	xxx
Short Loans Total		xxx

Placing an output value on short loans based upon the number of loans **out**, rather than items processed **into** short loans, implies a cost of \$xxx per short loan. Comments from the Program Manager suggested that the estimated processing cost of \$xxx per item seemed too high. This may be a reflection of some degree of error in allocating staff level-of-effort between processing and lending, and may include a small level of collection maintenance, re-shelving of items and so on. Nonetheless, with a processing cost of \$xxx per individual item, any changes to the storage and access regime for short loans material could have significant savings potential for the University. The new CAL agreement with universities which permits the digitisation and creation of e-reserve collections, may hold significant potential for longer-term savings in this activity, as might the eventual introduction of a statutory licence for electronic copying.

A total of 219,729 short loans were made in 1999, distributed across the various service points. Data within the model is slightly at variance with the activity driver data collected by service point, which indicates a total of 220,648 short loans, although this is not enough to affect the model outcomes. The data permits a comparison to be made between short loans activity across the service points only on the basis of which Program supports it. Information Resources Program supports short loans activity at Auchmuty and Huxley, while all other service points are supported by Client Services staff. These include the Law and Medicine specialist libraries, Music, and the Auchmuty AV section. A small number of AV reserve loans are supported through the Huxley library and these have been consolidated into the Auchmuty total for AV loans (these are less than 2% of the AV total and therefore not material to the analysis). Short loans by service point for 1999 were as follows:

Table 9 – Short loans by service point for 1999

Auchmuty	Huxley	Music	Law	Medicine	Auchmuty AV	Huxley AV
139,536	6,1520	1,679	5,648	702	5,462	101

Costs identified for each Program in support of short loans activity were \$xxx for Information Resources and \$xxx for Client Services. This produces a cost per short loan (inclusive of processing costs) of \$xxx at Auchmuty and Huxley, and \$xxx across the other service points.

Table 10 – Cost per short loan

Service Point	Total Loans	% of Total	Total \$	Cost per Loan \$
Auchmuty/Huxley	201,056	91	xxx	xxx
All others	19,592	9	xxx	xxx
Total	220,648		xxx	

As noted, the cost of a short loan was inflated due to an error in estimating the level of effort for short loan processing at the Huxley Library being directed to the lending activity. Overall, the Program supported the findings that indicate that the cost of processing an item is much higher than lending a short loan item. As the Program could only provide estimates for the number of items added to the collections during 1999, processes will be established to obtain accurate input data for 2000. Furthermore, the costing activity does not reflect the Program's view that the cost of adding a copied article to the Short Loan collections is much higher than that for a book.

The cost across the specialist service points is not surprising due to a number of reasons. Apportioning of staff time may have contained inaccuracies as staff generally perform other tasks while working at these service points. Short loan material at these service points is often more complex to deal with and students often require some instruction, turning the short loan activity into an information activity. Staff HEW levels at these service points is generally higher than at the central Short Loans service points due to the wide range of activities they undertake. The figure does, however, suggest that more efficient means of providing this service at the specialist service points should be investigated.

There may be value in separating these activities in the future when the University moves into digitisation of short loan articles in 2000/2001. In the future the size of the Short Loan physical collections should be significantly reduced with the majority of articles and book chapters being digitised.

It should also be noted that the data used to calculate the number of short loans did include in-house use of items within the Short Loan area, as the IR Short Loan services operate as Open Reserves. This, combined with the lower HEW level of staff providing a Short Loan service in IR indicate that the cost of providing a short loan item in IR at \$xxx per item is significantly cheaper than a similar service in the Client Services Program, which supports the more specialised collections.

An E-reserve pilot study will be introduced during 2nd Semester 2000 to provide access to Short Loan materials via the WWW. It is anticipated that the cost of adding a digitised item will be about the same as adding a print item, however this will be offset by savings in manual handling (lending and re-shelving) and elimination of duplication (duplicate copies within collections and across separate libraries).

At the beginning of 2000, a review of Short Loan processing procedures was conducted with items now being added to the collections in a shorter period of time. A review of the lecture note service is underway to move these to the electronic environment.

6.1.4 Inter-library Loan Services (ILL)

These activities were separately costed across three primary activities: incoming, outgoing and inter-campus. Total costs of these activities were estimated at \$xxx. Omitting incoming requests from the total, as these requests are not generated internally and the cost is generally recouped from the requesting library, the individual cost of an inter-library loan is:

Table 11- Individual costs of inter-library loans

Activity	Total Number	Total Cost \$	Unit Cost \$
Outgoing Inter-library Loan	9,608	xxx	xxx
Inter-campus Inter-library loan	4,107	xxx	xxx
Incoming ILL	12,217	xxx	xxx

The cost for providing an ILL to another library at \$xxx is well below the industry standard of approximately \$40 per item. In 1997 an ACLIS study on servicing incoming requests indicated that the library was supplying items for approximately \$6 an item. The ABC data therefore confirms that the supply side of the ILS operation is efficient. The distribution of postage costs across the Program's activities rather than specific activities (eg: outgoing ILL) would increase this figure slightly although a large percentage of articles are now sent via the Internet using ARIEL.

The cost for obtaining ILLs from other libraries is higher due to the HEW level of staff required to locate and request items from other libraries and commercial document supply agencies. As benchmarking data for outgoing requests was not available to the study, it is difficult to ascertain whether Newcastle's costs are comparable with other university libraries. This could be addressed by the National Resource Sharing Working Group who intend to conduct a costing study on both incoming and outgoing ILL traffic.

In 2000, the level of staffing in the requesting service was reduced by 0.5 (HEW 4) as a result of a downturn in the number of outgoing requests. It is anticipated that staffing levels in this area will continue to decline in response to a greater use of unmediated document delivery and SDI services. The introduction of LIDDAS in 2000 is expected to enable this transition.

Kinetica costs were not directly apportioned against the activities (incoming and outgoing ILL. Kinetica costs are not relevant to the Inter-campus ILL activity as this is managed by the INNOPAC system internally). There are two distinct costs associated with Kinetica, being the direct cost of \$xxx, and the per item cost. An outgoing ILL request generates a Kinetica charge of \$1.25 which also was not directly apportioned against this activity at the resource-input stage. An incoming ILL generates a direct Kinetica cost of 25 cents, which again was not directly apportioned.

As noted earlier in the discussion of Kinetica costs associated with cataloguing activity, this might be apportioned evenly across the three activities it supports: cataloguing, ILL and reference support (Client Services). Using this as the basis, \$xxx can be directly attributed to the two external ILL activities – incoming and

outgoing ILLs, along with the other directly identified Kinetica charges of 25 cents and \$1.25 respectively. This produces the following revised estimate of costs in ILL activity:

Table 12 – Costs in ILL activity

Activity	Total Number	Total Cost \$	Unit Cost \$
Outgoing Inter-library Loan	9,608	xxx	xxx
Inter-campus Inter-library loan	12,217	xxx	xxx

6.1.5 Inter-Campus Inter-library Loans

Subsequent analysis of the model data raised concerns at the cost and lower-than-expected level of inter-campus loans. Data collected subsequently to the estimates provided to the Project Team, revealed a total of 974 items sent via inter-campus ILL to the Central Coast Campus alone during March 2000. Extrapolating these figures to an annual level, might imply a total of approximately 8000-9000 such 'loans' annually. Applying this estimate against the total costs identified within the model, would produce a cost per inter-campus ILL of approximately \$xxx, based upon 8000 such ILLs, rather than the unit cost of \$xxx computed by the model on the assumption of 4107 such loans during the year. The new INNOPAC statistical package recently installed to track inter campus loan activity will provide more accurate data of this activity for future studies.

The level of intercampus loan activity is now tracked by INNOPAC and year to date (May 8) activity for 2000 indicates that over 4,343 items have been lent between libraries. These figures justify a revision of the data that was originally supplied to the ABC team. Further analysis of the statistical data indicates that INNOPAC is tracking two different types of intercampus requests:

- i. Items which are not on loan and are "paged" from the shelves and sent to the desired pickup location; and
- ii. Items which are on loan and are reserved by placing a Hold on the item with a request that the item be forwarded to a non-owning library location.

At this point in time, these two types of request cannot be separated. However, the labour cost for supplying items for (i) requests is higher than (ii) requests, because these items have to be retrieved from the shelves. The introduction of unmediated paging via NEWCAT probably accounts for the increase in the level of activity for 2000.

The Program had always assumed that the level of traffic was one-sided, with the greater consumer of the activity being the Central Coast Campus. Although this assumption has been confirmed by the INNOPAC data, the number of Central Coast items being requested by the Callaghan users is surprisingly high at approximately 40% of all requests. For example, in 2000, the Callaghan Libraries have lent 1,063 CCC items (39%) while the CCC library has lent 1,680 Callaghan items (61%). Overall, there are indications that the service is well used and is crucial in the Division's efforts to reduce duplication of resources between its three main libraries.

Another small component of the Inter Campus Service is the copy and supply of journal articles which are held in other campus libraries. The number of journal article requests was included in the 1999 manual statistics. Statistics collected during 2000 indicate that there have been 196 requests received from the Central Coast campus library with only 26 requests being submitted by the Callaghan Campus libraries for Central Coast articles. The cost for supplying an intercampus article copy would be equivalent to the cost (at approximately \$xxx) for supplying an ILL to another library as the same process is used.

6.1.6 Answering lending enquiries

The model estimated the cost of this activity at \$xxx and a cost per enquiry of \$xxx. The Program Manager identified a serious potential inaccuracy in this cost per enquiry. The 1999 activity data, which indicated 13319 enquiries was seen as flawed, and subsequently 1997 data was used as an alternative (plus 20%). This produced an implied total of lending enquiries of 119,903. Applying this figure against the model costings produced a cost per lending enquiry of \$xxx, which seemed more relative to the actual activity involved.

The major problem with this activity is the accuracy of the data that was used to obtain the cost of the service. Even the revised figure of \$xxx seems to be too high when a large proportion of enquiries are directional or straightforward. Up until 1997, loans enquiry statistics were collected for 22 different types of enquiry. The time required to collect the data combined with the inaccuracy of the collection process were major factors in the decision at the time to dispense with loan enquiry statistic collection. This decision is being reviewed due to the amount of resources being expended on this activity.

An analysis of the level of effort template indicates that the HEW 6 position in Auchmuty was allocated at 70% of their time against this activity, compared with 45% for the HEW 6 position in the Huxley Library, reflecting the absence of another category which addressed the administrative component of the team leader's position. Although an adjustment of the percentage level for this activity would not reduce the cost of a loan enquiry radically, it should be noted that salary savings equivalent to a HEW 6 in the Lending Services area has been achieved for 2000, a factor which would result in some variation of this overall and unit cost. A HEW 4 position has also been transferred from this area to the Electronic Resource Team, further reducing the overall level of effort in this activity in 2000.

6.1.7 Lending and Renewals

Both of these activities provide for a front desk staff interaction, or the option to self-check or self-renew. Over the counter or front desk services, also includes telephone renewals, but not self-renewals. Total cost of the loans service was estimated at \$xxx, while renewals were estimated at \$xxx. These costs represent costs within the Information Resources Program and lending and renewal activities supported at other libraries by Client Services staff.

Data within the model provides the following comparisons of these services:

Table 13 – Lending & Renewals

Activity	Number	Estimated Cost \$	Cost per Transaction \$
Lending: self-check	226,841	xxx	xxx
Lending: over the counter	230,416	xxx	xxx
Renewals: self-renew	313,907	xxx	xxx
Renewals: over-the-counter	238,978	xxx	xxx

Total loans were 457,257, very evenly distributed between over the counter and self-check loans. Total loans were distributed across the three main libraries as follows:

Table 14 – Loans distributed across the three main libraries

Library	Over the Counter %	Self-Check %
Auchmuty	26	30
Huxley	19	19
Music	5	0

6.1.8 Self Check Facilities

There was some discussion between the Project Team and the Program Manager concerning the identification of costs associated with the loans self check equipment. In the first instance, only direct maintenance and equipment costs were seen as relevant to this activity and staff costs were omitted on the basis that they represented significantly less than 5% of Program activity.

Upon subsequent analysis however, it was identified that some staff costs should have been applied against this activity, as the cost per item generated within the model is quite misleading. These staff costs would represent the time spent on equipment maintenance at an operational level, for example re-starting or setting the machine, ongoing client instruction and the considerable investment of staff time early in the new semester when staff are rostered to assist students in learning how to use the machine. This was subsequently estimated by the Program Manager to be equivalent to a 0.5 FTE at a HEW 2 level.

Future applications of the ABC model should take account of this to more accurately estimate the total cost in support of this activity. It might be assumed therefore, that the total costs in support of self check loans might be of the order of \$xxx - \$xxx per annum, rather than the much lower \$xxx identified in this study. This produces a quite different outcome per item lent.

Self check facilities are not available in the music library, where all loans must be over the counter. This also may have some effect on the unit costs and model outcomes given that clients are utilising this facility elsewhere, for approximately 50% of total loans.

The costs in support of self-renewals were seen as accurate. There is little requirement for staff input into this service, other than alerting clients to its availability.

There is little doubt that the use of self check units is more cost effective than staff assisted loans. Given that the industry standard for self loans is around 30% of loan activity, the uptake of the self check facilities in the Auchmuty and Huxley Libraries is impressive, although there remains further opportunity to expand usage in the Auchmuty Library. In 1999, 58% of book loans were lent via self check in Auchmuty compared with 70% of loans being self lent in the Huxley Library. The Program would also increase the level of staff activity allocated to the self check service to be equivalent to a full time HEW 2 position for 2000, compared to the level of effort applied in the model. This is in response to ongoing service problems associated with the Windows based model and increased efforts to promote the self service loans units during 2000 and other support activities. The significant degree of uptake and use of these facilities by users is a reflection of the level of effort the Program has made to inform and educate users about the service, and the commitment in ongoing support for the equipment to keep it operational.

Internal costings undertaken by the Program in 1998, estimated that the cost of an over the counter loan was about \$xxx. This estimate is confirmed with the ABC outcome of \$xxx per loan based on the 1999 data.

The majority of over the counter renewals are in response to requests for loan extensions by telephone. Although this process is relatively simple with most requests handled within a minute, the number of incoming calls is a source for concern with up to 4 incoming calls being handled simultaneously in the Auchmuty and Huxley Libraries on a regular basis. Although the number of self renewals via NEWCAT is increasing, the planned introduction of an automated telephone renewal module should reduce the labour component of this service. Future ABC studies will be able to demonstrate whether these assumptions result in overall efficiencies and savings.

6.1.9 Returns and Shelving

These two activities were estimated within the model at \$xxx and \$xxx respectively. The model generated the following data:

Table 15 – Returns & shelving data

Activity	Number	Total Cost \$	Cost per Transaction \$
Returns	446,714	xxx	xxx
Shelving	903,002	xxx	xxx

The difference between the number of items returned and the number shelved reflects the large number of internal returns. The Program estimated the ratio of internal returns to loan returns at 1:1.

The industry standard for in-house usage is 2 items used in-house for every item borrowed. The Program recommends the use of the 2:1 ratio for 2000 based on 2000 shelving activity. Although the move to electronic resources is having an impact on the number of items purchased, use of the library's physical collections seems to be on the increase.

The cost of the returning and re-shelving activities appears to be reasonable, although the activities undertaken within these areas is broader than simply returning items from loan and reshelving them. Other activities include assisting with the maintenance of the closed and open stack collections, shelf reading, mending, maintaining the Reference and Microform collections and the Medical Reserve area.

6.1.10 Lending equipment

This activity was included in the Information Resources module as it is a lending activity, but discussion of the model data and outcomes is contained within the Client Services section of this report (6.2.2). Total resources identified with supporting the activity were only \$xxx and it may not be worthwhile maintaining as a separate activity in future studies.

6.1.11 Administrative costs in adding an item to the collection

A number of activities can be identified which directly support the purchase, accessioning and processing of an item for the collection. These are:

- Ordering information resources
- Receiving and paying for information resources
- Accessioning and end processing information resources

Costs within the model identified for these activities were:

Table 16 – Administrative costs in adding an item to the collection

Activity	Number	Total Cost \$	Cost per Item \$
Ordering	12,768	xxx	xxx
Receiving	21,032	xxx	xxx
Accessioning	49,810	xxx	xxx

The variation in the number of items is a reflection of multiple items being received from the one order, serials, donations and so forth. The total cost is \$xxx, representing a median number of items of 21955. Using the average number of items ordered/received/accessioned as the driver (being 27870), the cost of adding an item to the collection may be estimated at \$xxx, exclusive of cataloguing. In either instance, somewhere around this figure lies the actual cost of adding an item to the collection, exclusive of cataloguing. Including cataloguing costs would produce the following cost for an item added to the collection:

- Adding an item (original cataloguing) \$xxx
- Adding an item (copy cataloguing) \$xxx

The high cost of these activities is a source of some concern, as previous costings by the library indicated that the cost of ordering, accessioning and cataloguing an item was about \$xxx. These costings did not include overheads. It is anticipated that the level of staffing allocated to these activities will decrease as we move into the electronic environment.

It should also be noted that the majority of the administrative processes are integrated, with the flexibility to move from one process to another at the same work station. Although this is a fairly efficient operation, some of the more straightforward components of the Resource Management functions could be outsourced leaving the more difficult or internal record management processes to be undertaken by internal staff.

6.1.12 Binding – Monographs and Serials

Model data identified a total of 3,210 volumes were bound in 1999, at a total cost of \$xxx. The cost per volume was therefore \$xxx. However, subsequent analysis by the Program Manager identified that binding expenditure for 1999 included \$xxx set aside within the book vote for this purpose. This cost was not identified at the resource input stage and is therefore contained within the overall activity 'Providing Access to Library Collections', which contains costs associated with the book vote and depreciation on the collection.

Adding this sum to the model data, produces the more accurate figure of \$xxx per volume bound.

A major component of the binding process was outsourced several years ago, although the more critical functions of identification of items to be bound and quality assurance aspects of the operation are still managed in-house. Although the study did not have access to accurate data concerning how much the former binding operation cost before the service was partially outsourced, it is known by reference to the budget line items from previous years that the overall cost of binding has reduced substantially.

The current operation works well and is mainly managed through the INNOPAC system. As the number of print serials subscriptions are reduced it is anticipated that this activity will continue to decrease over time, in relative and absolute terms.

6.1.13 Maintaining Library Systems

The model estimated this activity at a cost of \$xxx. The activity comprises the support and maintenance of the library's integrated management system (INNOPAC) in support of cataloguing, lending, acquisitions, administration and enquiries activities. Cost was apportioned across faculties on EFTSU, but there are additional beneficiaries of this service, including for example, those organisations with whom the University has a strategic partnership. In this instance, the most obvious external beneficiaries are Hunter Health and Central Coast Area Health Service.

The cost of this activity is reasonable given the level of investment in the INNOPAC software and its role in supporting the delivery of library related services across the University. The role of the primary staff position is wider than just support and maintenance. Other activities include the investigation of products, implementation and documentation of software enhancements, associated training and liaison with the supplier, other University areas and strategic partners. In 2000, the role of the position was reviewed and now involves managing the newly created electronic resources team.

6.1.14 Regional Archives and Rare Book Collection

Total cost of activities associated with research archives and the rare books and special collections, is estimated within the model at \$xxx. Based upon data supplied by Archives, the Faculty of Arts and Social Science was identified as the most significant user of this service, representing 69 % of the total use of historical archives and rare books and special collections, or representing \$xxx of the cost of providing this service. University archive data and costs is omitted from this calculation, but discussion of this activity is contained within section 6.8.10 (Other Resource Areas).

6.2 Client Services

This Program supports a total of 18 activities, fairly evenly divided between IT and library activities, although it should be emphasised that the integrated nature of the Division and of this Program’s activity focus, makes the distinction not as clear as it might first seem. Nonetheless, the Program’s activity can be broadly separated into four groups, based upon the predominant focus:

Table 17 – Number and costs of Program activities

Program	No. of Activities	Cost \$
Library	7	xxx
IT	7	xxx
QA & Evaluation	2	xxx
IESD Referral & Information	2	xxx

Total Program activities were costed within the model at \$xxx

6.2.1 Support for Information Resources Activity

During the course of the study, the Program identified several activities which were a primary activity of the Information Resources Program. During the level of effort distributions, Program staff identified approximately 5% of their time devoted to activities within the Information Resources group of activities. These activities were grouped within Client Services Activity 9 (Providing short loans and other IR activity), with the data later embedded within Information Resources activity data and omitted from the Client Services totals. Primarily, these activities centred around the specialist libraries for Law and Medicine and Music. In total, these activities accounted for \$xxx, being \$xxx in staff costs and \$xxx in other direct costs.

As noted in the discussion of the Information Resources activity data, costs for Kinetica were evenly apportioned across all Information Resources activity, rather than directly against the three principal activities which this system supports: cataloguing, ILL and reference support, the latter provided by Client Services. Two thirds of this cost has subsequently been distributed against the cataloguing and ILL activity in Information Resources, to generate a more accurate cost of those particular activities. \$xxx should therefore be apportioned against the reference support activity in Client Services to more accurately reflect the costs involved in that activity.

6.2.2 Lending Equipment

This activity was included in the Information Resources module as it is a lending activity, but the model data and outcomes are contained here. This activity is primarily supported through the AV section in the Huxley Library, and the model estimated a total of \$xxx consumed in support of it in 1999. A total of 1044 loans were made in 1999, implying a cost per loan of \$xxx.

The data provided is, however, very useful and does highlight the high cost of lending this equipment. Self check opportunities are not available for this type of lending and a loan often entails some instruction in use of the equipment. Unfortunately there is no other supporting data that reflects the true cost of providing this service. For example, cost of maintaining, repairing and upgrading the equipment. The Program has indicated that it will investigate means of reducing the cost of these loans and will consider a cost recovery model for delivery of this service.

6.2.3 Information Desks and IESD Referral Services

Providing assistance at information desks and provision of a referral service for IESD were significant activities for the Client Services Program, consuming 25% of total Program resources. The two activities consumed \$xxx and \$xxx respectively. Both of these activities cross both IT and library boundaries, as well as supporting the other activities of the Division. Distribution of inquiries across the Information Desks was as follows:

Table 18 – Distribution of enquiries across the Information Desks

Information Desk	No. of Enquiries	% of Enquiries
Auchmuty Information Desk	39,344	29.0
Huxley Information Desk	18,599	13.7
CT Building Information Desk	40,123	29.7
Music Information Desk	21,161	15.6
Law Library	7,305	5.4
Medicine Library	8,751	6.5

Unfortunately, the Project Team did not have the time to undertake a more comprehensive analysis of the model data for cost per enquiry at each of the service points. This data would be useful for decision making and planning, and future ABC studies should consider this option. The majority of enquiries related to information resources, while the Program estimated that total enquiries or referrals for IESD services amounted to 13,114 during the year.

The Program felt the model data was a fair assessment of the cost of the activity, the driver (number of enquiries) to be appropriate and the total cost realistic. The cost per enquiry as calculated by the model at \$xxx was considered reasonable. Inquiries at the Information Desks range from a few seconds (quick directions) to complex enquiry that may involve support for an individual on a number of occurrences over an extended period of time. The cost per enquiry may be somewhat inflated by periods when there is little or no activity of an enquiry nature at the desks, say at evenings when demand can drop fairly dramatically, and the staff may be engaged in other activities, although this was

not identified during the study. This may warrant investigation into desk peaks and troughs and to reconsider duties performed at the desks during slow periods. Difficulty lies in predicting when these peaks and troughs might occur. It is essential that any work undertaken at the desk that is not providing an information service is apportioned against the correct activity in the future.

The provision of a referral service for IESD is a new and unique service, representative of the integrated nature of the Division. No firm data has ever been kept on the number of referrals performed or the amount of time spent on this activity by Client Services staff. No firm conclusions should therefore be drawn from the model data, which indicates a cost per 'referral' of \$xxx. Of more significance is the total cost of this activity itself, at \$xxx, but even this is consequent upon assumptions as to the allocation of staff time at the desks.

While the activity itself is significant for the Program and the Division, the Program felt that it might be difficult to convince clients of its value. Equally, the relevance of this activity to any sector-wide study may be questionable. The data at least provides the Program and the Division with a clearer understanding of the approximate cost of the activity.

6.2.4 Management of Electronic Information Resources

Two activities can be identified in support of this function. These are preparing self-help tools and guides, and managing access to electronic information resources. The 1999 External Review of the Division made several recommendations relative to the uptake and management of electronic information resources (recommendations 17 & 18) and reference to these may be of value in assessing the data in the model relative to these activities.

A total of \$xxx was spent on these two activities in 1999, with a total of 278 electronic information self-help resources produced during the year. Program staff identified a direct relationship between the complexity of the electronic information resource, and the time taken to prepare self-help tools or guides to its use. The distribution of staff time identified that by far the greater proportion of the resources is spent on the preparation of self-help tools and guides for users (at 66%) than on management of these resources.

However, the Program Manager identified that it is perhaps in the activity involving preparation of self-help tools and guides that considerable inconsistency may be present. This is largely due to the cost driver (number of guides/tools prepared). The inconsistency centres around the inability to discriminate between guides. For example, one such guide or tool may involve the development of an interactive web-based tutorial that may take several weeks of work from a small team whereas another may be the updating of the library bookmark containing opening hours and telephone numbers, and thus represent a significantly lesser commitment of resources. Using the driver as identified, the model estimated on the basis of 278 'guides' produced in 1999, a cost per guide of \$xxx. Given the previous points regarding complexity and commitment of resources, this may be a relatively meaningless figure. Identification of a more appropriate driver, or a system of weighting the complexity and resource commitment involved in producing these resources may be a strategy more appropriate in any future study.

The model estimated the cost for ongoing management of electronic resources at \$xxx in total, or \$xxx per electronic information resource. The cost of managing an electronic resource is surprisingly low and may reflect efficiencies in managing this type of resource compared to traditional print collections.

Comparative data for this would be useful to validate or investigate this assumption.

6.2.5 Curriculum Based Information Skills

Two activities of the Program directly support curriculum based information skills, being preparing and design of curriculum based information skills, and delivery of curriculum based information skills. A total of \$ xxx was identified in support of these two activities, being fairly evenly divided between preparation and delivery. The activity driver used for preparation and design of curriculum based information skills was the number of courses developed (360), rather than the number of classes delivered (470). This produced an average cost per course developed of \$xxx. Delivery was estimated by the model to cost \$xxx per class or session. However, as both the design and delivery of curriculum based information skills are related, the following discussion may provide the more relevant assessment.

A total of 470 separate classes were delivered to 9,553 students during 695 hours of classes. This represents a total cost per hour of actual delivery of \$xxx, or, using the actual number of classes, \$xxx per session or class. These figures include both the design activity and the delivery, but are irrespective of the number of students or participants in any individual class. Distribution across faculties was as follows:

Table 19 – Distribution of curriculum based information skills sessions across faculties

Faculty	No. of Classes	No. of Students	No. of Hours
Architecture, Building & Design	52	689	93
Arts & Social Science	52	1,267	64
Education	45	980	66
Law	39	1,108	68
Medicine & Health Sciences	68	1,509	96
Music	10	87	13
Nursing	34	919	51
Science & Mathematics	94	2,054	151
International Students	94	940	94
Total	470	9,553	969

NB: Variations in totals are due to rounding

Class or session sizes vary from 9 in Music to 38 in Arts and Social Science, with the median around 20.

6.2.6 Generic Information Skills

One activity was identified in support of generic information skills – planning and delivery of orientation and generic information skills, representing a commitment of \$xxx. A total of 211 courses were delivered to 2496 students, at the Auchmuty and Huxley libraries, distributed as follows:

- Auchmuty 190 courses 2290 students
- Huxley 21 courses 291 students

The variation in total students is not explained within the model, but reflects some lack of detail in the data. The model calculated the average cost per student at \$xxx. The average cost per course or session delivered can be calculated from the model data at \$xxx, which is probably the more useful figure, given that the 'class' sizes may be quite variable, and the cost for one student will be the same as that for 20 or 40 or more.

Nonetheless, the cost per session appears significant, and may require further analysis at the Program level, to ensure that the level of effort and activity driver data provided was accurate, or whether other factors are at play in influencing the cost of this activity. It is most likely that the delivery of generic IT based classes are more costly than the library orientation sessions, as the IT classes normally have only a handful of participants and are generally of an hours duration, whereas the library orientation classes are larger but usually last only forty minutes. This distinction should be considered in future ABC studies.

6.2.7 Computer Labs

The Program committed a total of \$xxx to two activities dedicated to supporting computer labs, being scheduling and management of computer labs. Scheduling of the computer labs involves close liaison with faculties and the equitable apportioning of teaching space. Management of the computer labs involves close liaison and collaboration with the IT Infrastructure Program, and a full discussion of the total activity and model outcomes in support of computer labs is contained in the discussion of the IT Infrastructure Program's model results (see 6.3.4 IT Infrastructure).

While the cost for each request to schedule a class(es) as calculated within the model appears quite high at \$xxx, it was felt by the Program to be accurate. The scheduling activity is fairly non-discriminatory as no distinction is made between a request to book a lab for one class as opposed to a request to book a lab for a large number of classes, for example a term booking. The Program will investigate more streamlined methods for scheduling the labs including the use of a more sophisticated automated booking system as well as some web based self booking options.

6.2.8 Providing Consultancy Services to Assist Teaching & Research

This is a significant activity performed predominantly by senior staff in the Client Services Program, the Faculty Librarians. A total of 1919 consultations were identified as the driver for this activity. Against a total estimated cost of \$xxx, a cost per consultation can be implied at \$xxx. A total of 1098 hours of consultation was estimated as being consumed within the 1919 individual consultations.

When considering the cost per consultation (on average \$xxx for 34 minutes) the cost appears to be somewhat high, and this may reflect some level of estimation in the data. It may also reflect that preparation time for such consultations is not recorded by the Faculty Librarians. This preparation will be recorded in the future. Activity data for each of the faculty areas was based upon actual consultations for 1999 across some areas, while others were implied from 1998 data. Future iterations of the study would benefit from improved data collection in this area.

6.2.9 Selecting & Evaluating New & Continuing Information Resources

This was a significant activity in terms of the number of information resources evaluated during the year. The model estimated this activity as costing \$xxx, for selection and evaluation of a total of 14906 information resources. This implies a cost per item selected and evaluated, of \$xxx per item. The Program felt this was a fair and reasonable indication of the commitment required to this activity. Analysis of this activity would benefit by being added to other costs associated with information resources to provide a complete costing for acquiring and managing items.

6.2.10 Resolving Computer Problems

The model calculated this activity at a total resource cost of \$xxx for 5131 enquiries, representing a cost per enquiry of \$xxx. This data may prove useful for future SLA negotiations. While the Program has, in the past, estimated the average time taken to resolve a computer problem to be 90 minutes, this data suggests that this is an under estimation. As a result of this (and to validate SLA charges), the Program will need to ensure that Desktop Services staff record ALL enquiries and track resolution times with greater accuracy.

Table 20 - Resolving Computer Problems

Faculty/Division	No. of Calls	% of Calls	Total Costs \$
Arts & Social Science	733	14	xxx
Economics & Commerce	728	14	xxx
GSB	23	0	xxx
Education	505	10	xxx
Law	190	4	xxx
Medicine	1037	20	xxx
Nursing	150	3	xxx
External Relations	455	9	xxx
Finance & Property	267	5	xxx
Research	56	1	xxx
OUSR	896	17	xxx
VC's Unit	91	2	xxx

6.2.11 Planning, Management & Implementation of Significant Software Installations

The resources required to perform this activity are significant, calculated within the model at \$xxx. The Program supported only a handful of such installations during the year, and the model data therefore should be used to inform future Client Services contributions to such installations. The small number of installations vary significantly in the commitment required by the Program. Nonetheless, the overall commitment is significant. The Program will need to track its commitment to each project with greater accuracy.

6.2.12 Deployment & Provision of Software

The total cost estimated for this activity within the model was \$xxx. However, the considerable consumables component of this activity, at around \$xxx, may lead to some misleading interpretations of the cost per unit generated by the model, at \$xxx. Total salary costs committed to this activity were identified as \$xxx, on the basis of level of effort data provided by the Program. A further \$xxx was committed to software licence purchases, and \$xxx of consumables (undefined) was spent through the Software Sales cost centre. All of these direct non-salary

costs were included in the model total for this activity, along with an apportionment of the general non-salary costs across the Program.

The Program identified a total of 1,732 requests and site licences managed. Deleting the software licence and purchase costs, the total salary and other costs assigned to this activity are \$xxx. This represents a cost of \$xxx in managing each software licence. There was some discrepancy surrounding the figure of 1,732 requests and site licences managed. The Program provided a figure of 4,081, which would produce an indicative cost of managing each software licence of \$xxx. Some review of the model data and activity data would be warranted to more accurately reflect the cost of this activity.

It would be useful in future projects to break down the requests according to packaged software or site licence software. This data would provide the Program with information that would enable choices to be made in relation to products and services provided through the software sales outlet. This data would need to be collected by the Program in its normal activity.

6.2.13 Advising Clients on Use of Hardware/Software

There is some relationship between this activity and Client Services Activity 1 (Providing assistance at information desks) so comparisons between the two are valid. However this activity is normally more involved with greater levels of complexity in the advice and understanding required by staff. The model estimated this activity at a total cost of \$xxx, representing a cost per enquiry of \$xxx, as against a cost per enquiry at the Information Desks of \$xxx, which the Program thought too high.

Activity driver data for this activity was based on an estimate by Program staff, and more reliable data collection in the future may be useful in providing a more accurate assessment of the true cost of supporting the activity. It may also be useful to combine this activity with Client Services activity 1 (Providing assistance at information desks) to obtain a more accurate representation of the broad range of information services delivered by the Program.

6.2.14 Managing Desktop Computer Standards

The model estimated this service as costing \$xxx. Given an estimated total of more than 3,000 Macs and PCs across the University managed by Client Services staff, this was felt to be a reasonable assessment of costs. The cost per PC was estimated as \$xxx, using the number of FTE staff as the basis.

6.2.15 Evaluation and Quality Assurance

The Program undertakes two activities in support of these functions, on behalf of the Division – Evaluating Divisional Services, and Providing and Implementing a QA Framework. These two activities consumed a total of \$xxx and \$xxx respectively, total of \$xxx. Within the model, both of these activities were apportioned against faculties on the basis of EFTSU data for 1999. However this is not seen as an entirely appropriate method as the two activities support evaluation and QA measures across the totality of IESD services, which are accessed not only by academic faculties but also by the other operating divisions of the University.

The evaluation activity included conduct of forums and surveys, and management of the suggestions and feedback mechanisms for the Division. It was difficult to identify meaningful activity drivers within this group of functions,

given the high degree of variability in activity required in support of each of these functions. Equally, the QA activity involved the development of client service charters for the Division and individual Programs, as well as the conduct of forums and workshops associated with this. Again, identification of appropriate activity drivers was problematic.

The overall investment by the Division in these two activities, at \$xxx is significant, but the data within the model has not produced anything of great value against which the effectiveness or efficiency of the activities might be judged either internally, or ultimately, against which a benchmark might be set. Given the level of investment, substantial reflection on these activities and outcomes is warranted.

6.3 IT Infrastructure

There are clearly identifiable costs within the IT Infrastructure Program's accounts, which should be appropriately assigned to activities supported elsewhere in the Division. This occurs where traditional IT activities now cut across several Program areas of IESD, such as Client Services, the Web Team and Information Systems, but the cost is still incurred and sits within the General Ledger account for IT Infrastructure. In some instances, these costs were able to be identified and re-assigned against the relevant activity. Nonetheless, considerable costs remain within the Resource Module for IT Services and have been apportioned across the activities of that Program. This strategy enabled the Project Team to maintain the overall integrity of the Model and its alignment back against the General Ledger. Similarly, like other Programs within the Division, the inter-relationship of activities and services to clients means that many costs incurred within one area, directly relate to an activity or service provided by another area of the Division.

6.3.1 Maintenance and Development of Presentation Facilities (Educational Technology Services)

Total costs within the model for presentation support, development and maintenance, was estimated at \$xxx.

The Program assigned weightings to reflect the considerable difference in time taken to maintain a theatre compared to a classroom (activity IT 2). Nonetheless, because the distribution was evenly assigned across faculties based on bookings data, the unit cost generated in the model reflects a cost per facility, and the weightings were not applied within the model. Maintenance of presentation facilities and support for users of these was provided at a total cost of \$xxx. The model generated a user support cost of \$xxx per booking, based upon 7068 bookings during 1999 of central teaching spaces. A more indicative driver would have been the number of calls received or requests for service during the year, as individual bookings may not necessarily generate a call for assistance.

The cost of regular maintenance of these facilities was calculated within the model at a total of \$xxx. Applying the weightings suggested by the Program, being X5 for a lecture theatre and X1 for a classroom, the annual maintenance cost can therefore be estimated as:

- Maintenance of lecture theatre presentation facilities \$xxx
- Maintenance of classroom presentation facilities \$xxx

The IT program estimated that the development of presentation facilities cost a total of \$xxx during 1999. This being for a total of 32 projects, as follows:

Activity Based Costing

- 20 classroom fit-outs
- 9 partial upgrades, and
- 3 full upgrades.

The model, using level of effort and other data provided by the Program, generated a total cost for this activity of \$xxx, implying an average cost of \$xxx per project. However, using weightings provided by the Program, the following, more relevant cost per facility type can be estimated:

Table 21– Cost per facility type

Activity	No. Completed in 1999	Weighting	Individual Cost \$
Classroom fit-out	20	1	xxx
Partial theatre fit-out	9	3	xxx
Full theatre fit-out	3	5	xxx

6.3.2 Maintaining specialised electronic equipment

The majority of this activity is undertaken in support of activities in Information Resources Program, with a very small amount supporting the Student and Academic Services Division. Total cost of this activity was calculated as \$xxx.

6.3.3 Central Computing Infrastructure

The total cost of central computing infrastructure operations was estimated within the model to be \$xxx. This was broken down across four activities, being:

- i. Creating and maintaining user accounts \$xxx
- ii. Managing central computing infrastructure operations \$xxx
- iii. Developing central computing infrastructure \$xxx
- iv. Maintaining central computing infrastructure \$xxx

The operational costs relating to central computer infrastructure (i, ii & iv above) were calculated within the model at \$xxx and are an area of activity that would benefit from further analysis. Cost saving measures to date have focussed on rationalising the number and type of central computer systems. However much of the cost is outside the Program's control and derives from the University's adoption of IT to support its teaching, research and administration activities, priorities driven from elsewhere in the organisation.

User accounts were estimated by the model to cost an average of \$xxx to create and maintain, based upon a total of 21842 accounts. Likewise, managing the central computing infrastructure was estimated at \$xxx per account, using the same data.

The Program maintains a total of 49 central computing systems, across Solaris, NetWare (Novell), VMS and Windows NT environments. Program staff identified variations in the support required for each of these systems, reflecting complexity of the systems themselves, as well as the particular skill set and expertise of the available staff. The number of systems of each type, the weighting applied, and the cost per system type, were calculated within the model as follows:

Table 22 – Central computing infrastructure

System Type	Number	Weighting	Cost Per System Type \$	Total Cost \$
Solaris	13	2	xxx	xxx
NetWare	28	1	xxx	xxx
VMS	6	2	xxx	xxx
Windows NT	2	1.5	xxx	xxx

A total of eight projects were undertaken during 1999 in developing central computing infrastructure (IT activity 8), these being equally divided between 'small' and 'medium' projects. No 'large' projects were undertaken during the year. Cost was apportioned using the number of accounts, but an implied cost per project can be estimated from the model data. Total cost of this activity was \$xxx.

The number of projects of each type, the weighting applied, and the cost per project, were calculated within the model as:

Table 23 – Type, weighting & cost per project

Project Type	Number	Weighting	Cost Per Project \$	Total Cost \$
Small	4	1	xxx	xxx
Medium	4	2	xxx	xxx
Large	0	5	xxx*	0

* This may be assumed to be indicative of such a developmental project, as a reference point for future projects.

6.3.4 Computer labs

Total cost of support provided by IT infrastructure for central computer labs was estimated at \$xxx. Client Services program identified a further \$xxx within two activities, bringing the Divisional total for this activity to \$xxx. The four activities were developing, maintaining, managing and scheduling computer labs.

There was some discrepancy in the model in the activity driver for lab use. Client Service's data indicated 5175 hours or sessions, and IT data indicated 4374. The reason for this discrepancy is not clear. Using the lower sessions figure (the IT data), the average cost of a lab was therefore \$xxx per session (a higher figure than would result using the Client Service data). However this is probably not an overly useful figure, either for decision making or benchmarking purposes.

Given that there are 453 machines (Mac and PC) across all labs, the annual cost in developing, maintaining, managing and scheduling computer labs can therefore be calculated from the data at \$xxx per machine. However, the Program staff provided information that maintaining and supporting Apple Mac

labs represented 1.5 times the workload per machine in a PC lab. The type of machine is not likely to be relevant to the scheduling or management of the labs, these activities being supported by the Client Services Program. The weightings reflect the skills and expertise of staff within the IT area, and may not necessarily be the same at other institutions.

Applying these weightings to the data for developing and maintaining labs, produces the following per annum cost for maintaining and supporting Mac and PC based labs:

Table 24 - Weighted cost for maintaining & supporting labs including development costs

	# of machines	Weighting	Total \$	Per machine \$
Macintosh	49	1.5	xxx	xxx
PC	404	1.0	xxx	xxx

The cost above is inclusive of development costs for new labs. Excluding this data would produce the following per annum cost for maintenance and support only, of Mac and PC based labs:

Table 25 – Weighted cost for maintaining & supporting labs excluding development costs

	# of machines	Weighting	Total \$	Per machine \$
Macintosh	49	1.5	xxx	\$xxx per machine
PC	404	1	xxx	\$xxx per machine

However given that development of new labs is an ongoing cycle, the costs immediately above need to be treated with some caution.

The costs identified within these 4 specific activities associated with computer labs, does not include central computing resources to support the labs, such as servers, disc space and so on, networks, information desks for assistance to users or software costs, for example. These costs are embedded in activities elsewhere within the model.

The Program indicated that it would be useful to identify the development costs of a new lab, either PC or Mac. The model identifies a development cost of approximately \$xxx per machine, or \$xxx for a 30 seat lab, excluding equipment costs. However, it is difficult to quantify or validate this figure, given the assumptions underlying the activity. For example, the Program applied weightings to the cost of supporting a Mac lab in comparison to a PC lab. Whether these assumptions are equally relevant or applicable to the development of a lab is not clear, and future studies should seek to clarify this distinction.

The ongoing costs incurred to operate a 30-seat lab are approximately \$xxx and \$xxx per annum for Macintosh and PC respectively.

6.3.5 Telephone operations

Total cost of the telephone operations of the University supported by the IT Infrastructure Program were estimated at \$xxx.

Two major projects were undertaken during the year, at a total cost of \$xxx. This is not sufficient to warrant further analysis.

Provision of the central switchboard and directory service was estimated within the model to cost \$xxx while managing and maintaining the system cost \$xxx and \$xxx respectively. Excluding the development costs, the operational system can therefore be estimated at having cost \$xxx, or \$xxx per extension per annum, based upon 3484 extensions.

Provision of the central switchboard and directory services represents approximately 42% of the total resources consumed on telephone operations, or \$xxx according to the model. The Program is considering ways to reduce the manual processing of calls, for example by the removal of all STD bars for outgoing phone calls, which may have a positive effect on this in future studies

6.3.6 The Data Network

Total costs in support of the University data network were estimated within the model at \$xxx during 1999. Activities within this group are:

- Installing and maintaining data network connections
- Managing data network operations
- Maintaining the data network
- Developing the data network

Installing a new data network connection or changing an existing connection was estimated within the model to cost \$xxx, on the basis of 1513 requests during 1999. Requests include new connections, moves or changes to existing connections.

Based upon 7442 existing data connections, the cost of the data network during 1999 can be estimated as approximately \$xxx per connection. Maintaining the data network was clearly the most significant activity in this group, consuming 61% of the total resources, or \$xxx.

Four major projects were undertaken in 1999 to develop the data network, being one large project and 3 medium projects. Total network development costs across these four projects were estimated by the model to be \$xxx during 1999.

The Program noted that the model estimated the cost of \$xxx per annum to support each telephone user but only \$xxx per annum to support each network user. This was the reverse of expectations.

6.4 Information Systems

6.4.1 Activities in Support of Packaged Corporate Systems

Two activities of the Program could be grouped under this heading, being participation, evaluation and implementation of packaged corporate information systems, and maintenance and support for packaged corporate information systems. It could also reasonably be argued that the activity, monitor and plan for growth of all corporate information systems also belongs in this category, given the implied direction of the University toward packaged solutions. Costs identified were:

Table 26 - Activities in Support of Packaged Corporate Systems

Activity	Total \$	Number	Per unit (as applicable)
Evaluation & implementation	xxx	20 systems	
Maintenance & support	xxx	690 requests	\$xxx
Monitor & plan	xxx		

Total estimated costs for activities associated with corporate information systems is therefore \$xxx.

Activities in support of in-house corporate information solutions

The data indicates that by far the biggest cost and activity within the Information Systems Program is maintaining and supporting in-house corporate information solutions. This activity consumed \$xxx, or 62% of the Program’s total resources. Analysing, design and development of in-house corporate information solutions, by comparison, consumed just \$xxx. While the latter is still a significant sum, it indicates that the burden of activity falls squarely on the maintenance and support side, while new development is far more modest. Total cost in supporting and developing in-house corporate information solutions is \$xxx, representing 72% of the Program total. This would be a valuable activity group to monitor over time.

Cost object data for the maintenance activity reveals the following distribution:

Table 27 - Support for corporate information systems

Division or Faculty	%	\$
Research	8	xxx
Finance & Property	14	xxx
External Relations	7	xxx
Student & Academic Services	67	xxx
Education	1	xxx
Arts & Social Science	0.4	xxx
Medicine & Health Sciences	1	xxx

6.4.3 Evaluation and implementation of ad hoc reporting (Tools for Desktops)

This activity is relatively small in terms of overall resources, consuming just \$xxx. However the number of requests for services and cost per service indicate a fairly cost effective outcome. 165 requests for service were estimated as being addressed during 1999, at an average cost of \$xxx per request.

6.5 IT Training (Learning & Development)

There is some inconsistency in the level of effort data within the model for the two activities identified within this group, and the activity data for IT training delivery more generally. According to activity data, the total individual IT-related training sessions delivered in 1999 were 204, representing 931 hours of training, across 39 different courses. The total participants were 1063, excluding IESD staff. Total resources consumed were estimated at \$xxx.

The level of effort data for these two activities, identifies a spread of roughly 79% of effort devoted to delivery of IT training, and 21% to design and development. This includes 0.6 FTE for administration staff who organise the sessions and take bookings from participants. Nonetheless, the total training hours delivered suggests that the proportion of time devoted to design and development is higher than that initially indicated in the level of effort proportions. Omitting the administration time from the total for delivery, produces a proportion of 61% of time committed to delivery, and 39% to design, development and administration, still indicating more than 2 FTE on delivery, which is not supported by the delivery data, which totals 931 hours. Nonetheless, it might also be assumed that the activity 'delivery of IT training workshops' included time spent on administration matters, preparation for the session and follow through with participants, which would provide some allowance for this gap.

The model estimated a total cost of \$xxx in design and development of IT training programs. Activity data provided by the staff indicated a total of 39 different courses. Assuming each of these was designed and developed during the year, a cost of \$xxx per course is indicated. However it would be a reasonable assumption that some courses would have been developed in previous years. Equally, the model estimated delivery of training sessions as costing a total of \$xxx, or \$xxx per participant per session. Taking the view that design, development and delivery are all inter-related, and consolidating both of these totals, produces a cost of \$xxx per participant per session, or \$xxx per session, on the basis of the activity data.

In summary, a total of 2.7 FTE were committed to the design and delivery of IT training in 1999, excluding administration staff. The ratio of the level of staffing to the total training hours delivered, and the indicative costs estimated by the model, should be benchmarked against training providers in the vocational education and training (VET) sector, which would be equivalent to the level and type of training delivered, as well as against similar internal training provision at other universities, in order to gain a more complete picture of the effectiveness of this activity.

6.6 Web Development Team

The Web Team identified three principal activities. Total resource inputs were calculated within the model at \$xxx, and were estimated as being consumed across the three activities as follows:

- | | |
|--|-------|
| i. Developing and maintaining web applications | \$xxx |
| ii. Developing and maintaining web sites | \$xxx |

- iii. Leadership, coordination and support for websites \$xxx

6.6.1 Web application development and maintenance

Development and maintenance of Web applications was calculated within the model at a base cost of \$xxx for a basic system, which might for example, be described as a read only application. The Team identified a total of 13 applications developed and maintained in 1999, being distributed across three, broad categories.

Basic systems, as noted, might generally be read only applications. More sophisticated systems, for example those involving development of authentication and read/write facilities, were given a weighting of 6 relative to the basic systems. Complex systems, were described as being fully featured, with significant database complexity and interactions with other databases and involving a range of web protocols, were given a weighting of 10 relative to the basic systems.

Using the activity data and weightings developed by the team, the following can be estimated as the cost per system.

Table 28 – Cost per system for Web application development & maintenance

Type of System	Number	Complexity Factor	Cost/System \$
Basic	7	1	xxx
Sophisticated	2	6	xxx
Complex	4	10	xxx

6.6.2 Development and Maintenance of Web Sites

The Web Team support the development and maintenance of a total of 1,089 web pages. Over half of these (639) are on behalf of the External Relations Division, for Media and Marketing Services. Pages maintained for the Division’s web site amount to 122. Both the M&MS and IESD web pages are relatively similar in terms of time commitment and complexity. The Team maintains a total of 328 web pages for community and other clients, under cost recovery arrangements. The Team weighted the development and management of these pages at a factor of 3 relative to the internal pages, reflecting its assessment of their technical complexity and the higher burden of project management and liaison involved with external or user-pays clients.

Applying this data and the weightings to the costs derived from the model, produces the following cost per page for development and maintenance of web pages.

Table 29 – Cost per page for development & maintenance of web pages

Client	# of Pages	Complexity Factor	Cost/Page \$
M&MS	639	1	xxx
Community & Other	328	3	xxx

6.6.3 Leadership, coordination and support for websites

Leadership, coordination and support for websites was calculated within the model as consuming a total of \$xxx. There was considerable debate within the Project Team and with the Web Team regarding an appropriate driver for this activity. No appropriate driver was identified and as a result, a significant cost has been identified but with no data to indicate what causes or might cause this cost to increase or decrease. The total cost was identified on the basis of level of effort data, but this is not an indicator of what is driving the activity. The number of web authors was initially proposed as a driver, but this was not agreed by the Web Team as appropriate.

The reasons for this include the fact that not all tasks in this activity are directly proportional to the number of web authors, since they have to be done as a consequence of maintaining a site, (eg. maintaining a search engine and related collections, log file analysis, as well as some policy issues) and are therefore required irrespective of the total number of authors or users. The number of authors in an area is also not necessarily indicative of their consumption of this service, since skills and requirements vary considerably across faculties and divisions

This activity includes a significant component (in salary terms) of support for flexible learning software that again is essentially unrelated to the number of web authors. Future studies might more appropriately seek to separate the costs of supporting flexible learning web-based systems from the leadership activity, which may have elements of administration of a more general nature embedded within it.

6.7 IESD Executive and Administration

Two activities were identified within this group: Operational IT, and Planning, Policy and Development. Costs within this cost group were those identified with the IESD executive and central administration. The Operational IT activity represents a proportion of the Executive level of effort devoted directly to IT-related operational matters. The activity Planning, Policy and Development, represents the executive and strategic roles of IESD executive and administration.

The total cost attributed to the Planning, Policy and Development activity is artificially inflated by the inclusion within the IESD executive central cost centre, of special purpose expenditures, such as costs associated with consultancies and some centrally (IESD) funded staff development activities. Difficulties in extracting these from the accounts has meant that they remain within this total activity cost. Future ABC exercises would benefit from increased clarification of the IESD account structure, which would permit these costs to be more clearly identified and assigned to the actual activities they support, leaving only those costs more clearly associated with the executive and administrative functions.

No clearly definable activity drivers were identified during the study, although many were discussed. Discussions centred on such outputs as the number of strategic and management plans generated, involvement in strategic committees and groups (such as CAUL and CAUDIT and so forth), and contribution to the University's strategic planning and management through membership of SMG and VCAG. In the end, no meaningful drivers were used within the model and the only outcome identified is a total cost of \$xxx underpinning this activity.

The Operational IT activity consumed \$xxx in 1999. The cost was apportioned using FTE but this may not be an appropriate driver for the activity. In future ABC studies, this would be more appropriately apportioned across those IT activities which it directly underpins, rather than as a stand-alone activity.

6.8 Other Resource Areas

A number of activities were not directly associated with library or IT activity, or easily associated with a particular program. Some of these activities were associated with the Infrastructure Development Plan, while others involved the strategic planning and budgeting functions of the programs. A total of 7 activities were grouped within two distinct resource modules: Generic and Infrastructure Development. A further activity, 'Maintain, process and provide access to University archives' was also included in the study, but is not specifically either a library or IT activity. This activity is supported by the Information Resources Program, through its Archives area.

Within the 'Generic' resource module were three activities:

- i. Providing and implementing a QA framework
- ii. Preparing strategic plans and budgets, and
- iii. Supporting strategic partners

Within the 'Infrastructure Development' resource module were four activities:

- i. Year 2000 Project
- ii. Maintaining Administration Systems
- iii. Implementing HR System; and
- iv. Student Photocopying

6.8.1 Provide and implement a QA framework

Discussion of this activity is contained within the section 6.2.15 Client Services, as the activity is supported directly within this particular Program.

6.8.2 Preparing strategic plans and budgets

This activity defined planning and budgeting activities at the Program or Unit level, contributions to strategic planning and policy development, and involvement with external bodies of professional relevance to the activity of the Program. It did not include the strategic planning time of the Division Executive or Administration functions, which were separately collected within the activity Planning, Policy and Development.

This particular activity was costed within the model at \$xxx. As with the activity Planning, Policy and Development, no meaningful activity drivers could be identified.

A breakdown of level of effort salary commitments across the program and unit areas reveals the following distribution of costs associated with this activity:

Table 30 – A breakdown of level of effort salaries commitments across the program

Program area	Salary costs	% of Program Activity	% of Division Total
	\$	'A'	'B'
Information Resources	xxx	2	19
Client Services	xxx	4	32
Information Systems	xxx	8	12
IT Infrastructure	xxx	3	22
Web Team	xxx	6	6
L&D IT Training	xxx	20	8

The estimate of total salaries across the Division committed to this activity were \$xxx. Column **A** indicates the proportion of the total Program salary commitment identified by the Program in its level of effort distributions, devoted to this activity. Column **B** indicates the proportion of each Program area’s share of this activity.

There is wide variation in the totals, and this may be indicative of several factors. Firstly, there was some confusion during the early stages of the project, in how to allocate level of effort to planning and budgeting activity, and between strategic planning activities and those which might have a more direct, Program-related focus. Secondly, the nature of strategic planning is not necessarily directly proportional to the size of the program area or function, so the variations indicate to some extent the necessary requirement of all managers to be involved in strategic planning within the Division. Finally, within the level of effort distributions within each program area, there were differing levels down to which Program Managers allocated their time and that of their staff, to this activity. Some level of effort allocations were either concentrated at the Program Manager level, or distributed across a group of senior managers and coordinators, or spread more broadly throughout the Program.

Given the total amount of resources identified as consumed by this activity and the lack of identification of meaningful activity drivers, more intensive analysis of this activity in future studies would be desirable.

6.8.3 Supporting strategic partners

This activity represents the costs involved in supporting strategic partners of the University. Principally, the activity involves library services as provided through the Information Resources Program and identified in the study. Total costs identified with supporting this activity were \$xxx. Of this, \$xxx was the sum paid to Hunter Health for services to the University available through the Gardner Library. The remainder was the activity cost identified in supporting and liaising with strategic partners, which was considered by the Program to be a time-consuming exercise in some instances.

6.8.4 Infrastructure Development

Three specific projects were identified within the IDP as needing to be included in this study. These were:

- i. Year 2000 Project

- ii. Maintenance of Administration Systems, and
- iii. Implementing the HR System

A total of \$xxx was committed to these three projects. It is difficult to analyse the model data in any meaningful way, as no specific activity driver data was identified. Costs within this total, were identified across four categories: salaries, software maintenance, depreciation on capital equipment and consumables. Against each of these activities, the breakdown is therefore:

Table 31 - Breakdown of Costs for Infrastructure Development

Activity	Salaries \$	S/w maint \$	Depreciation \$	Consumables \$	Total \$
Y2K	xxx			xxx	xxx
Admin Systems	xxx	xxx			xxx
HR System		xxx	xxx		xxx
	xxx	xxx	xxx	xxx	xxx

Many of the infrastructure development projects involve significant capital outlays, and the study identified that there were some inconsistencies in how these were treated within the accounts. Improved planning of these projects has been an ongoing strategic objective of the Division in recent years, and this will continue to inform the treatment of these activities within the general ledger. Future ABC studies will need to address the approach to the treatment of these projects with consideration of their consistency with the broader activity of the Division.

6.8.5 Student photocopying

This is an activity supported through the Information Resources Program, but is not directly attributable to either the library or IT area. Only direct costs were identified during the study, at \$xxx. No further analysis is warranted at this stage, although the Program may be interested in separate analysis on a machine by machine basis.

6.8.6 Central costs

A number of costs directly associated with the provision of library and IT services were identified within the University’s overall accounts. These were depreciation on the capital cost of buildings, depreciation on the book collection and the annual book vote (i.e. purchases of information resources). Three specific activities were created to assist in identifying costs and activity associated with these, being:

- i. Providing access to Library Collections
- ii. Providing access to Library Buildings
- iii. Providing access to IT facilities

6.8.7 Providing access to library collections

This activity contained those costs identified within the central accounts as associated with the provision of the information resource collection. The two costs identified were depreciation on the book collection, at \$xxx (excluding Central Coast) and \$xxx for non-capitalised information resources. The majority of the annual book vote is capitalised and therefore not included as a resource cost in the model.

The cost was distributed by EFTSU, on the basis that students were the predominant users of library resources. This produced a unit cost of \$xxx per EFTSU.

6.8.8 Providing access to library buildings

This activity captured central costs associated with provision and support of physical building spaces occupied by the university libraries (excluding the Central Coast Library). Total cost of this activity was estimated at \$xxx, being represented by the following central costs:

- Power, lighting and heating
- Repairs and maintenance
- Water and Sewage
- Cleaning
- Insurance (buildings)
- Insurance (collection)

The cost was distributed by EFTSU, on the basis that students were the predominant users of library resources and buildings. This produced a unit cost of \$xxx per EFTSU.

6.8.9 Providing Access to IT Facilities

This activity captured central costs associated with provision and support of physical building spaces occupied by the IT areas or IT equipment throughout the campus, such as network rooms. Total cost of this activity was estimated at \$xxx, being represented by the following central costs:

- Power, lighting and heating
- Repairs and maintenance
- Water and Sewage
- Cleaning
- Insurance (buildings)
- Insurance (capitalised equipment)

The cost was distributed by FTE, on the basis that staff were the predominant users of IT and computing buildings. This produced a unit cost of \$xxx per FTE. Distribution by EFTSU, to provide a comparison with library facilities, would produce a unit cost of \$xxx. In neither instance is the comparison or the driver necessarily relevant or meaningful.

6.8.10 Maintain, process and provide access to university archives

This activity is not strictly either a library or IT function, but is nonetheless provided within the University through the Archives area of the Information Resources Program. Activity data collected during the study indicated a cost of this activity of \$xxx, with a total of 660 items processed at a unit cost of \$xxx. Because this activity is integrated within the Archives area, it would be difficult to

ignore in any future study, as the costs incurred in supporting it must be considered within the total Archives-Information Resources Program activity if costs are to be accurately apportioned.

7. Cost Consumption by Faculty/Division

The model provided a basis for distributing the costs incurred in providing IT and library services, back against the client areas driving the activity. Not all costs were directly apportioned to other areas of the University due to inadequate data or unavailability of appropriate activity drivers. Some activities identified within the study were of a non-IT or library focus, and were therefore omitted from any apportionment against faculties or divisions. A further category was external clients, although the total costs attributed to external clients was negligible. Within the model, the following distribution of costs was made:

Table 32 – Cost consumption by faculty/division

Faculty/Division	\$	% of Total	% of FTE
Faculties	xxx	80.0	56
Divisions & Executive	xxx	14.0	36
IESD (un-allocated)	xxx	4.5	
Non-library/IT	xxx	0.5	
External	xxx	1.0	
Total	xxx		

The total for all faculties includes \$xxx of ‘multidisciplinary’ expenditure within the library. The percentage of FTE column is provided for comparison purposes only. The important issue it indicates is that faculties are consumers of IT and Library services at a much higher proportion than divisions and non-teaching areas. The percentage FTE totals are inclusive of Central Coast Campus, and the Divisions & Executive total includes IESD FTE staff.

Activity Based Costing

Figure 1: Total apportioned costs within the ABC model - % of total \$

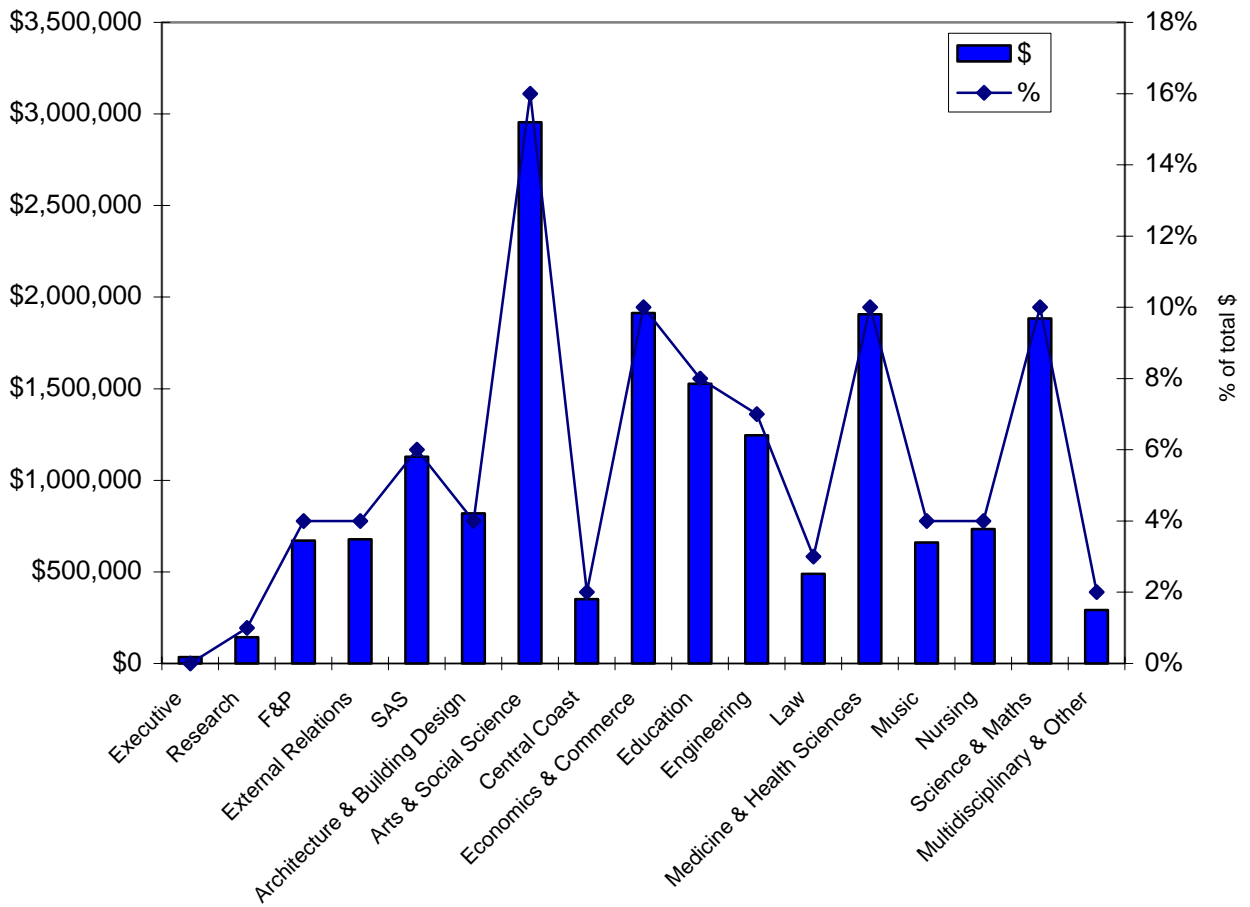
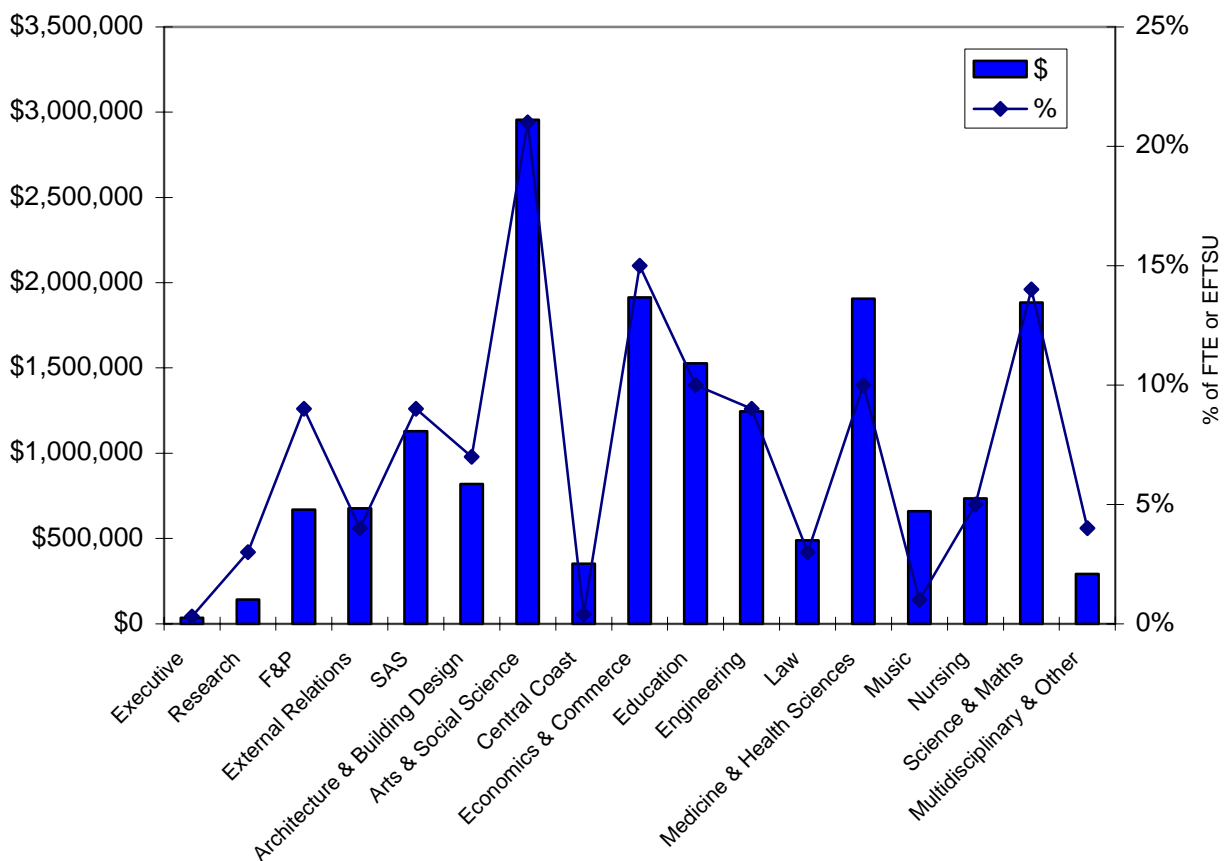


Figure 2: Total apportioned costs within the ABC model - % of FTE or EFTSU



The percentage of FTE or EFTSU in the graph is indicative only, but provides a useful point of comparison against the total dollar estimates for each division or faculty. The 4% of EFTSU against Multidisciplinary & other represents the Enabling Programs student load. Staff associated with this would presumably be within the External Relations FTE figure.

The following table represents the proportion of resources consumed by each Division and Faculty of the total activity of each Program area

Table 33 - Consumption of Program activity costs (%)

	Web Team %	IT Infrastructure %	Information Systems %	Information Resources %	Client Services %	L&D IT Train %	Other %
Executive	5	0	0	0	0	0	0
External Relations	33	6	6	2	4	5	0
Finance & Property	7	7	20	0	6	11	0
Research	6	1	6	0	1	4	0
Student & Academic Services	5	10	66	0	8	13	0
Architecture, Building & Design	1	2	0	6	4	1	8
Arts & Social Science	3	8	0	25	13	10	27
Economics & Commerce	3	9	0	9	11	4	19
Education	10	4	1	12	8	3	13
Engineering	1	14	0	6	6	4	4
Law	2	4	1	3	4	2	1
Medicine & Health Sciences	10	8	1	8	14	27	17
Music	0	2	0	9	6	0	1
Nursing	8	5	0	5	5	3	2
Science & Mathematics	6	19	0	9	9	13	7

The slight variation in totals for Information Resources and Client Services is the result of rounding, and the omission of data for the multi-disciplinary category and the external categories.

7.1 Consumption of Program Activities by Divisions

Below are several tables which represent analysis of the model data on the basis of activities provided by each Program and as accessed by each Division.

Dollar totals for all activities provided by each Program to each Division are detailed in the table immediately below. The percentage amount in the second table below, represents the proportion of services of each Division's access in total of IESD library and IT services during the year, by Program.

Table 34 - Divisional consumption of IT & library activities by Program (\$ totals)

	Web Team \$	IT Infra- Structure \$	Information Systems \$	Information Resources \$	Client Services \$	L&D IT Training \$	Other \$	Total \$
Executive	xxx	xxx			xxx			xxx
External Relations	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Finance & Property	xxx	xxx	xxx		xxx	xxx		xxx
Research	xxx	xxx	xxx		xxx	xxx		xxx
SASD	xxx	xxx	xxx		xxx	xxx		Xxx

As can be seen in the table immediately above, there is wide variation between Divisions in the access they make of IT and Library Services. Given the significant differences in activity across Divisions, this is not surprising. The next table expresses the dollar totals above as a percentage of each Division's total consumption of IT and library activities.

Table 35 - Distribution of Divisional consumption by Program (percentage of Division total)

	Web Team %	IT Infra- Structure %	Information Systems %	Information Resources %	Client Services %	L&D IT Training %	Other %
Executive	X	X	X	X	X	X	X
External Relations	X	X	X	X	X	X	X
Finance & Property	X	X	X	X	X	X	X
Research	X	X	X	X	X	X	X
SASD	X	X	X	X	X	X	X

7.2 Consumption of Program Activities by Faculties

Analysis of the model data on the basis of activities of each program as accessed by each Faculty produces the following results. Totals for all activities provided by each Program to each Faculty are detailed below. The percentage amount represents the proportion of services provided by each Program of each Division's total access of IESD library and IT services during the year.

Table 36 - Consumption of program activities by faculties

Faculty	Web Team	IT Infrastructure	Information Systems	Information Resources	Client Services	L&D IT Training	Other	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Architecture, Building & Design	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Arts & Social Science	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Economics & Commerce	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Education	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Engineering	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Law	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Music	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Nursing	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Science & Mathematics	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

The following table expresses the dollar totals above as a percentage of each Faculty's total consumption of IT and library activities.

Table 37 - Distribution of Faculty consumption by Program (percentage of Faculty total consumption of IT and Library activity)

Faculty	Web Team %	IT Infrastructure %	Information Systems %	Information Resources %	Client Services %	L&D IT Training %	Other %
Architecture, Building & Design	X	X	X	X	X	X	X
Arts & Social Science	X	X	X	X	X	X	X
Economics & Commerce	X	X	X	X	X	X	X
Education	X	X	X	X	X	X	X
Engineering	X	X	X	X	X	X	X
Law	X	X	X	X	X	X	X
Medicine & Health Sciences	X	X	X	X	X	X	X
Faculty	Web Team %	IT Infrastructure %	Information Systems %	Information Resources %	Client Services %	L&D IT Training %	Other %
Music	X	X	X	X	X	X	X
Nursing	X	X	X	X	X	X	X
Science & Mathematics	X	X	X	X	X	X	X

Slight variations in percentages are due to rounding and the omission of some small amounts (eg. multidisciplinary).

This table produces some surprising results. The percentage figures represent the proportion of activity by Program of the Faculty's total consumption of IESD library and IT activities.

Of note is the high level of cost consumption for IT Infrastructure services within Science and Mathematics and Engineering, two faculties which maintain some of their own IT services.

Of note also is the high proportion of costs assigned to "other". Virtually no costs were apportioned to this category within Divisions. There is also wide variation in the proportion of this cost within each faculty's consumption of IT and library activity, ranging from X% for Music to X% for Architecture, Building and Design. Some of this will reflect the apportionment of indirect costs, while some faculty totals will include direct apportionment of specific activity costs, such as support for strategic partners. Nonetheless the overall level of costs assigned to this category may reflect an inappropriate distribution within the model, or lack of appropriate activity data resulting in high level of resource costs being accumulated within this category.

Deleting the 'other' category from the table, and re-calculating the cost consumption across faculties, produces the following percentage distribution:

Table 38 - Access by Faculty of Program Services (deletes “Other” column)

Faculty	Web Team	IT Infra-structure	Information Systems	Information Resource	Client Services	L&D IT Training
	%	%	%	%	%	%
Architecture, Building & Design	X	X	X	X	X	X
Arts & Social Science	X	X	X	X	X	X
Economics & Commerce	X	X	X	X	X	X
Education	X	X	X	X	X	X
Engineering	X	X	X	X	X	X
Law	X	X	X	X	X	X
Medicine & Health Sciences	X	X	X	X	X	X
Music	X	X	X	X	X	X
Nursing	X	X	X	X	X	X
Science & Mathematics	X	X	X	X	X	X
Multidisciplinary	X	X	X	X	X	X

Again, there remains a high level of consumption of IT activity by certain faculties, and wide variation across faculties in general of their consumption of information resource activity. The latter may reflect the relative size of faculties, or the specialist nature of information resource services to particular faculties.

8. RECOMMENDATIONS TO IESD MANAGEMENT TEAM

8.1 Program and Unit Activity Reports

8.1.1 Information Resources

A number of recommendations arising from the data and analysis within the ABC Report can be identified. These are grouped below, within the broad activity categories of the Program.

Recommendation 1 - Cataloguing

It is recommended that the Program:

1. ***Review the cost effectiveness of cataloguing activities including investigation of shelf ready services.***
2. ***Review the level of original cataloguing (review of the level of effort across cataloguing should also be undertaken).***
3. ***Undertake a manual collection of cataloguing activity statistics.***
4. ***Review the cost effectiveness of cataloguing activities including investigation of shelf-ready services.***

Recommendation 2 – Short loans & e-reserve

It is recommended that the Program:

1. ***Investigate the provision of Short Loan services from centralised service points. This will also be informed by the review of service points also being conducted by the Client Services Program.***
2. ***Introduce enabling strategies to increase the level of unmediated requesting and SDI services.***
3. ***Apportion Kinetica charges in any future ABC studies to ILL activity according to usage rather than the assumptions applied in this particular study.***
4. ***Implement the LILDDAS software in 2000 to manage in-house ILL records more efficiently.***

Recommendation 3 - Lending Services

It is recommended that the Program:

- 1. Introduce simplified data collection processes for loans enquiry.***
- 2. Continue the review of policy and procedures in the Lending Services area. A Working Party was established in 2000 to investigate and recommend strategies to simplify loans enquiry processes***
- 3. Improve the level of signage in the libraries to reduce the number of directional enquiries.***
- 4. Continue to promote the use of self-check units in the Auchmuty Library and barcode all remaining open access items.***
- 5. Purchase a self-loan unit for the Conservatorium of Music Library in 2001.***
- 6. Purchase the INNOPAC telephone renewal module. (A trial will commence in 2000)***
- 7. Investigate the use of the self-check units to accept fine payments via EFTPOS.***
- 8. Conduct further analysis into the model data on lending services across all libraries.***

Although the introduction of a new rostering system in the Auchmuty Library has increased the ability to re-deploy resources to areas of need, there have been serious shelving backlogs during April and May 2000. Resource Management staff have been assisting with the shelving to maintain a reasonable level of service.

Recommendation 4 - Returns & Shelving

It is recommended that the Program:

- 1. Continue to review the level of staffing required to undertake returns and shelving services.***
- 2. Amend the new rostering system, with staff allocated to shelving for longer periods to produce greater efficiencies.***
- 3. Investigate the employment of additional students in 2001 to shelve at peak times. This is in addition to the students currently being employed. Funding options will include not refilling vacant full-time positions.***

Examine the feasibility of implementing self service loans with a pre-sort capability. (This technology is currently under development.)

Recommendation 5 - Ordering information resources.

It is recommended that the Program:

- 1. Review the cost effectiveness and level of efficiency of processing and ordering activities including the investigation of shelf ready services.***
- 2. Investigate joint purchasing and processing schemes with other universities.***
- 3. Consider the introduction of unmediated ordering processes.***

8.1.2 Client Services

Client Services have proposed a review of their service points and it is possible that the present provision of Short Loan services from these areas could be centralised to the general Short Loan collections managed by the Information Resources Program. The benefits of the e-reserve initiative should also reduce the level of manual handling across all these service points, and this should be closely monitored. This review may also have implications for the operation of the specialist Law and Medicine Reserves.

Recommendation 6

It is therefore recommended that this should be monitored closely along with the introduction of the e-reserve initiatives.

Recommendation 7

It is recommended that the basis for apportionment of the costs of the Kinetica software across activities within Client Services and Information Resources needs to be addressed prior to any further ABC studies.

In this study, Kinetica costs were initially distributed across all activities within the Information Resources Program using level of effort data as the basis of the distribution. Subsequent analysis of the data by the Project Team involved distribution of the costs of Kinetica against three specific activities in the two programs, being: cataloguing and ILL activity in Information Resources, and reference support in Client Services.

Recommendation 8

As identified in 6.2.3, further investigation of activity associated with the Information Desks may be warranted to consider alternatives for using staff during varying periods of peak and low demand.

Recommendation 9

The study identified a significant cost associated with the activity of providing a referral service for IESD. The activity data and level of effort assumptions underlying this activity were somewhat questionable, and any future ABC study should seek to identify more useful data to underpin any assessment of this activity. As noted in the discussion of the model outcomes, there was some question within the Program of the value clients may place on this activity and its relevance to sector wide studies. While the latter is a reflection of the uniqueness of the Division's structure, the first issue should be addressed through client surveys and feedback, and it is recommended that this be monitored.

Recommendation 10

Management of electronic information resources was identified within the study as an area requiring further study to identify more appropriate activity drivers and measures of activity and effectiveness. It is recommended that this be addressed in any future ABC study.

Recommendation 11

The cost per session for providing generic information skills was identified as an area requiring further analysis by the Program, on the basis of data within the model.

Recommendation 12

It is recommended that the Program investigate costs and activity associated with booking of the computer labs.

Recommendation 13

The Program identified that the cost of providing consultancy services to assist teaching and research seemed high, and it is therefore recommended that improved or alternate data collection and information be addressed by the Program prior to any future ABC study or review of this service.

Recommendation 14

The model estimated total costs in resolving computer problems at \$xxx, or \$xxx per enquiry (5131 for 1999). This data should be used to inform development of SLAs. It is recommended that the Program monitor and review its data collection methods to ensure all relevant information is being captured.

Recommendation 15

It is recommended that the Program continue to monitor costs associated with the planning, management and installation of significant software installations, as the study revealed costs of \$xxx associated with this activity, but very little activity data was available with which to determine information of use in decision making.

Recommendation 16

The relationship between the activity 'advising clients on use of hardware and software, and 'providing assistance at information desks' should be investigated, and more reliable methods of data collection investigated.

Recommendation 17

More appropriate activity drivers and activity data should be identified for the activities in evaluation and quality assurance, as little information of significance can be ascertained from the model.

8.1.3 IT Infrastructure

The majority of the activity (maintaining specialised electronic equipment (IT Activity 4)) is undertaken in support of activities in Information Resources, with a small amount supporting the Student and Academic Services Division.

Recommendation 18

On the basis of the above, future ABC studies might therefore seek to more appropriately align the cost of the activity 'Maintaining specialised electronic equipment' (IT activity 4) with those activities it underpins elsewhere in the Division or University.

The cost of providing user support for presentation facilities as estimated within the model at \$xxx, was larger than expected by the Program. It is anticipated the figure for

2000 will be lower due to the discontinuance of the evening shift (presently, staff are on-call if needed). The main cost driver for this activity is requests by academics for assistance in using the presentation equipment and for fault resolution.

There is potential for cost savings through better training in the use of equipment by lecturers, whose current competency the Program believes is variable. However training and awareness initiatives by the Program in the past have been met with disinterest. Changes in the behaviour of lecturers, in both increasing their competence and moderating their requests for assistance, could be encouraged through a user-pays scheme, which might serve to modify current behaviour.

The ABC model suggests a fee of \$xxx per callout would cover costs, although some calls arise from equipment failure for which the Program would not charge. The Program would need to identify clear strategies and principles by which it could be identified that a call-out was either user-pays, or the responsibility of IESD. These would need to be clearly articulated and promulgated to all users. IESD is already working to simplify and standardise presentation facilities across the campus and to exploit new technologies where appropriate, eg centralised control of theatre lectures via the network, and these strategies should continue to have a positive effect on efficiencies within the Program.

Recommendation 19

That the Program investigate issues associated with provision of user support for presentation facilities, including user-pays, training and awareness.

Recommendation 20

That the Program investigate more appropriate activity driver data for the activity 'maintaining specialised electronic equipment', and the relationship of this activity to those within the Information Resources Program.

Installing and maintaining connections for telephones and the data network are cost-recovered services. Currently the Program charges around \$xxx for a telephone connection and \$xxx for a network connection, compared with the ABC-derived costs of \$ xxx and \$xxx. The ABC study identified cost for the data network connection, if accurate, will prompt a reduction in the charges.

Recommendation 21

It is recommended that further analysis of the data and underlying assumptions within the model be undertaken to validate the costs identified in installing and maintaining connections for telephones and the data network, prior to any decisions regarding cost recovery charges.

The cost driver for development activities is problematic, given the range of project types and the unique nature of each project. A more useful activity measure may be the effort and cost of managing such projects, rather than the staff time devoted to their implementation or the equipment and consumables costs.

Recommendation 22

It is recommended that issues associated with development activities be further investigated prior to any future ABC studies. A relevant question may be whether the number of projects (weighted by scale/complexity), as used in this study, is a valid and replicable driver.

Recommendation 23

That industry standard benchmarks be identified and compared to those used in this study, for activity associated with development, maintenance and support of computer labs. This will inform future ABC studies and ensure reliable benchmark standards for any sector-wide study.

8.1.4 Information Systems

Recommendation 24

The ongoing level of activity and costs identified within the study in support of in-house corporate information solutions, requires further analysis and monitoring.

Recommendation 25

That consistent data collection strategies be implemented to address the activity 'Evaluation and implementation of ad hoc reporting tools for desktops'

8.1.5 IT Training (Learning & Development)

Recommendation 26

That costs associated with the design, development and delivery of IT training programs in-house be continually monitored against those available from other providers.

8.1.6 Web Development Team

Recommendation 27

That consistent methodologies be identified for tracking and monitoring activity associated with the development and maintenance of web applications.

Recommendation 28

That appropriate activity drivers be identified for activity associated with development and maintenance of web sites.

Recommendation 29

That appropriate activity drivers be identified for activity associated with leadership, coordination and support for web sites.

8.1.7 Infrastructure Development Plan

Activity data and other relevant information from projects and activities included within the Infrastructure Development Plan was difficult to integrate effectively into the model. Future ABC studies would need to be preceded by some careful planning and data collection, to enable IDP funded projects and activity to be effectively captured and used to capture the real cost of such activities. This would be evident also in areas where ongoing maintenance costs for IT equipment and corporate systems have been consolidated within central funds, and are no longer captured within IESD's accounts.

Recommendation 30

That appropriate activity driver data be identified for IDP projects, for future ABC studies.

That more effective methods of apportioning costs and activity associated with IDP activity which involve IESD staff, be identified.

8.2 Activity at the Divisional Level

Upon reflection, better definitions and earlier resolution of difficulties in capturing information about certain activities would have provided a clearer indication from the model data of activity which cuts across Programs at the Divisional level. Most obviously, the activities which created some confusion were those associated with strategic planning and budgeting (as opposed to Program or operational level planning and budgeting), quality assurance and evaluation. Staff development at the Program or unit level was also an area of some confusion.

Future studies should seek to more clearly define the activities underpinning strategic and management planning, so that level of effort allocations can be more appropriately estimated. Within the existing model, the level of resources and effort dedicated to these activities appears very high and may not be a true reflection of the actual demand on people's time.

Recommendation 31

That more appropriate descriptions of strategic and budget planning activities be developed for future ABC studies.

That greater consideration be given to Division-wide workshops in future ABC studies, to agree on level of effort distributions for strategic and budgeting activities.

That appropriate activity drivers be identified for strategic and budget planning activities.

8.3 Identification of Possible Duplication of Effort

The study identified several areas where services overlap or are delivered concurrently by several Programs. Prima facie this is not necessarily an indication of duplication of effort, inefficiency or a need to consolidate these services within the one Program's jurisdiction.

Most clearly, duplicate activity was highlighted between the Client Services and Information Resources Programs. Again, the reasons underpinning this apparent duplication reflect different responsibilities to different client groups, or the specialised nature of some faculties' needs. It is inherent in the integrated nature of the Division that boundaries between Programs will not be impervious.

The model data provides a basis for some comparison between activity across Programs, although it would be too simple to suggest that it is the only criteria that should be used.

Recommendation 32

That areas of concurrent activity across the Division be reviewed by the relevant Program areas, for possible duplication of effort.

8.4 Activity Data Collection

As noted in the Program-specific recommendations, several references have been made to the need for improved activity driver data collection. Concurrent with this, is the need to ensure that the activity drivers identified are the most appropriate both in terms of the activity itself, and in respect to informing the Division and relevant decision-makers as to the effectiveness and efficiency of the activity.

Recommendation 33

That all Programs review activity drivers for each activity, prior to any future ABC study at this University, or a sector-wide study.

8.5 IT and Library Activity Reporting

Most of the activities within the model can be identified as either IT or library-related. Where some activities are of a more integrated nature, where they overlap both areas (such as QA and strategic planning) apportionment on some logical principles would provide a basis for obtaining an estimate of the total cost of library and IT activities within the University.

At this stage this analysis has not been undertaken, but should be done prior to any further development of the model as a sector-wide tool.

Recommendation 34

That activities representative of the integrated nature of the Division be reviewed and clearly articulated in any sector-wide ABC model developed out of this study.

8.6 Budgeting and Planning Processes

As noted in 8.2, there was some confusion surrounding the difference between strategic level planning and the operational level within the Program. This may have caused some distortion in the level of effort data for staff in terms of time apportioned to strategic planning in some areas, while in others it may have been embedded across activities at the Program level. Recommendation 31 should assist in addressing this matter.

8.7 Activity Focus versus Client Focus

Program Managers may be better placed to make judgements regarding the usefulness of the activity data and apportionment against cost objects, in providing relevant information for decision making at the client service level. One issue which arose during the study concerned whether an SLA was an activity in itself, or simply a collection of generic activities tailored to a specific client. The latter option was chosen as the basis for the study, but from a decision-making and planning point of view, the Division may wish to consider whether the model in its present form, in identifying activity data and costs, provides sufficient information for the accurate apportionment

of costs associated with supporting SLAs, or whether these might be analysed differently in any future study.

Recommendation 35

That senior managers within IESD review the ABC study critically in the context of the development of the Division-level SLAs.

Difficulties were experienced in relating ABC 'activities' to the Program's 'services'. The ABC model tracks low-level activity costs which do not always match with the higher-level services as seen by IESD's clients. For example, IESD provides central computer infrastructure services as well as computer laboratory services. However some of the central computer infrastructure related 'activities' are in support of the computer laboratory 'service'. Within the ABC methodology used, these central computer infrastructure activity costs cannot be easily combined with the other computer lab activity costs to provide a consolidated view of computer lab service costs. An additional layer of abstraction between the activity costs and the cost objects (ie. the faculties/divisions) is needed.

Recommendation 36

That the Division be informed by other ABC studies as to the appropriate level of direct apportionment of infrastructure and support costs against higher level activities.

8.8 Uniformity of Processes

There was some inconsistency in the study and how it was addressed by each area involved. In part, this was a reflection of the relative lack of knowledge of the ABC methodology among the project team, and subsequent failure to identify relevant issues early in the project. Future projects should be informed by the increased level of awareness within the Division, and greater knowledge among potential project team members. No recommendations are seen as necessary in this instance.

8.9 Usefulness of Model for SLAs

During the development of the Model, one Program Manager questioned whether Service Level Agreements (SLA) were an activity. The Project Team did not accept that they were, but acknowledged that the Model might be useful as an indicator of the costs in supporting a particular SLA. SLAs are more representative of a Cost Object than an activity, but were not treated as such in this study.

If the activity data is clearly identified and the individual activities accurately costed and apportioned against Cost Objects, then it should be possible to identify the cost of a particular SLA from the individual activities from which it is assembled.

Recommendation 35 addresses this matter.

8.10 Other Attributes

As a solitary exercise the ABC process allows the full cost of activities to be understood and assessed against the benefits they provide (assessment and analysis however may be objective or subjective). Further, the ABC findings steer cost-saving efforts towards activities where greatest costs are incurred and hence the greatest potential return. The ABC data also allows user-pays charging schemes to be audited against the true costs.

However the real value of the ABC methodology is in allowing comparisons of costs and so permitting an assessment of the 'goodness' or otherwise of the expenditure levels. ABC provides a repeatable method for analysing costs so that trends over time can be observed and comparisons can be made against other organisations and against industry benchmarks. When making comparisons some care is needed since the ABC findings do not consider the quality of the service being provided, for example, the speed of a network connection.

The ABC methodology does not recognise the unpaid overtime that may be underpinning the low cost of an activity. Within IESD (and many parts of the University) large amounts of unpaid overtime are routinely worked which may incur high costs at a later stage through staff turnover, stress leave, low morale leading to low productivity and so on.

Recommendation 37

That future ABC studies and the sector wide model clearly articulate the assumptions and basis for dealing with unpaid or accrued overtime.

9. FUTURE RECOMMENDATIONS

9.1 Enhancement and Operational Development of the ABC Model

Discussion in the previous two sections has identified a range of areas and issues which should inform any future development of the model for internal use, as well as its applicability more broadly within the higher education sector.

Internally, greater clarification of some of the definitions would assist in a more accurate apportionment of level of effort within Programs, as well as greater consistency in how this is applied across the Division. If the model is to be utilised beyond IESD, then these more generic definitions would need further clarification. These matters have been addressed in the recommendations.

As was found during the study, focus upon a single 'group' of cost objects, such as organisational units, was a more effective approach than utilising a spread of cost objects between organisational units and student types. Apportioning costs across all activities against student types would be one option, although how this might be achieved in some areas, such as Information Systems, would require further investigation.

As noted in the recommendations, the model would benefit from further clarification and definition of some of the activities and activity drivers.

9.2 Possible Development of a University-Wide ABC Model

The Division could contribute to any university-wide approach to ABC, or to a specific study within a particular organisational unit. Nonetheless, initiatives in promoting and implementing ABC as a cost management strategy within the University are not the prerogative of the Division.

9.3 Use of an ABC Model to Identify Duplication of Effort or Organisation-wide Efficiencies

One area of potential duplication *within* the model in any organisation-wide study, is in the distribution of central costs. The model apportioned some central costs, such as power and heating, cleaning, depreciation, insurance and so forth, but not others. There is no allowance within the model for apportioning costs associated with the University Executive (the VC's office), or for payroll or HR services. It is arguable therefore whether the costs as identified across activities, with the inclusion of *some* central costs, are truly reflective of the actual cost. Future studies might need to consider whether these other costs should sit 'outside' the immediate service area, to be separately costed in a university-wide study, and only then apportioned back, if at all.

Nonetheless, practice within individual institutions may involve budgetary responsibility for such central costs at the organisational unit level, precluding the above. The more appropriate approach may therefore be the identification of those central costs that are truly relevant to the activities and clearly articulating the basis upon which they should be apportioned at the sector level.

9.4 Alternatives to EasyABC Plus

Some alternatives within the marketplace have been identified, but not investigated or evaluated. These include the systems developed and supported by Baum Hart and Partners in the UK, which is being used by the University of Canberra and considered by Macquarie.

9.5 Ongoing role for the Division and the University in ABC

Any decision to utilise ABC methodology elsewhere within the University should be driven by those that see its potential to inform their decision making and planning. The Division can play an active role in informing the University of its experience in ABC and the usefulness or otherwise of the methodology and outcomes of the study to its processes and decision making.

At the sector-wide level, the Division should ensure that the library and IT communities are informed of the ABC experience at a general level, but more specifically of the relevance and outcomes of the study within each of the two focus disciplines.

Appendix A: Project Charter

1.0 Introduction to Cost Management

The current state of cost management in most universities is not adequate to support the needs of their businesses and the changing landscape. Financial and accounting managers within these institutions have been the primary architects of cost management information. They have traditionally focused on meeting external reporting and basic management accounting needs - an extension of the institution's general ledger. The cost management processes are disjointed. Information resides in transactional "data islands" making it hard to reach and difficult to analyse promptly. This has resulted in a high degree of frustration from all sides. Information has been developed in a vacuum within institutional silos using inconsistent practices and less than credible numbers.

Universities need to link goals to overall strategies. This can happen only if people and teams understand the value creation process and embrace the framework as a part of their culture. There is no better way to focus and motivate people than through effective use of cost management because "if you can't measure it, you can't manage it".

Cost management should continuously be challenged to ensure that the information needs are kept current as strategies change to meet competitive pressures and opportunities. Institutions (and their leaders) need to understand how they create, maintain or destroy economic value by their decisions and actions. Cost management is the yardstick that enables this process. Structuring this information in an organised and methodical manner will assist all university staff to better understand their actions and decisions by focusing attention on those activities that create economic value. The framework should ensure that all aspects of cost management are fully integrated and inter-linked with scorecards, activity based management, and strategic and tactical planning efforts.

Several major themes are associated with world class cost management. First, executives should approach cost management on an institution-wide basis and they should develop it as a corner stone of their institutional culture. Second, they should incorporate certain key concepts into their overall cost management framework at the appropriate level in the institution. Finally, systems and processes should be flexible enough to support the information needs required to meet changes in strategies, markets, competition, etc.

University leaders should not view cost management as an accounting exercise but as a business tool that enables managers with the information and feedback necessary to meet their goals and track progress towards the attainment of the strategic agenda.

Today service organisations, such as universities, need costing systems to perform three primary functions:

- financial reporting for management and statutory purposes;
- understanding the costs of activities, products, services and customers; and
- providing feedback and insights to management on what causes costs.

Activity based costing (ABC) appears to be the only tool that currently is able to deliver information to service sector organisations that satisfies the last two of these primary functions. It is able to achieve this through:

- determining an institution's major processes and activities;
- determining the activity cost and activity performance;
- determining the output and output measure;
- tracing the activity cost to various cost objectives such as services, courses and students; and
- evaluating process/activity effectiveness and efficiency.

ABC is likely to be most appropriate in complex and highly diversified organisations that have high support overheads and operate in highly competitive environments. These features characterise many universities operating in Australia and elsewhere. In such institutions, ABC can perform an important strategic planning role and furnish university executives with information which enables them to identify under utilised resources and thereby, to achieve efficiency gains.

Activity Based Costing

Cost management information provided by ABC and other techniques should be viewed as providing a distinct competitive advantage. University leaders should consider cost management like any other critical business process. It should not be considered as a one-time exercise but as a part of continuous improvement. It needs constant care and attention to ensure that the ever changing information needs are being met. Institutions must manage their cost management processes to be flexible and responsive to change, in order to meet the competitive challenges ahead.

The higher education sector will see a significant difference between the past and future trends. Changes will occur more frequently, more intensely, and in a more competitive, global environment. This environment will challenge all universities even more and will underscore the importance for cost management processes that are flexible, timely, and provide information critical to support their decisions. University leaders will either make major decisions based on “gut” feelings or good information. Those institutions that can adapt to the new environment, measure their cost effectively, and put this information to good use will have an advantage.

2.0 Project Scope

This project will be broken into two key phases, phase one which involves a pilot study costing exercise at one university - nominated to be the University of Newcastle - and phase two which will see the costing methodology, tools and techniques developed from the pilot study rolled out to other Australian universities.

The pilot study phase one at The University of Newcastle will focus on examining the Information Technology and Library activities of this institution. This will involve analysing where these activities are undertaken across the institution, including the central support areas and the faculties/division. This will ensure that The University of Newcastle is made aware of the full cost of providing these activities across the whole institution.

The pilot study will identify a standard set of activities undertaken within the Information Technology and Library area of The University of Newcastle. It is anticipated that the number of activities identified will not exceed 100. With respect to cost objects it is the intention of attributing the activity costs down to the divisions, hence in this study the divisions operating at The University of Newcastle will be the cost objects.

Based on a commencement date of February 2000 this pilot study will examine the costs of the Information Technology and Library areas for the year 1999 (Jan to Dec 1999). Cost driver information will also be collected for the same period.

We propose to utilise a specialised costing tool for compiling, attributing, analysing and reporting cost information. Based Ernst & Young’s assessment of this software we recommend that The University of Newcastle purchase a copy of EasyABC Plus (ABC Technologies). This package is sold and marketed globally with significant success, plus being marketed and supported locally.

The principle ownership and responsibility for the pilot will rest with the University Project Manager and the consultants role will be one of guidance and support. A set of duties is outlined in section 5.1.

3.0 Project Approach

The basic concepts of ABC are very important and easy to understand. There are *four key “ABC terms”* that are helpful in learning and using ABC and share experience with other practitioners:

1. resources;
2. activities;
3. cost objects; and
4. drivers.

There are *two phases involved in the development of ABC models*, Phase I and II, which are designed to speed ABC model development as well as to quickly provide insights. Phase I is fully costing activities. Phase II is fully costing cost objects. The following is a list of the steps of each phase:

Activity Based Costing

Phase I — Activities

1. Identifying all the activities that occur within the areas within the project scope.
2. Identifying all the resources consumed in the institution (general ledger dollars, people/salaries, depreciation dollars, utilities, etc.).
3. Identifying a resource driver (the number of people, number of computers, amount of space, etc.) for each resource, to link resources to the activities which consume them.
4. Fully costing activities with the resource dollars they consume via resource drivers.

Phase II — Cost Objects

1. Identifying cost objects, the ultimate purpose of activities — list of products, services, customers, distribution channels, etc.
2. Identifying an activity driver (eg. the number of people) for each fully costed activity, to link activities to the cost objects which consume them.
3. Fully costing cost objects with the activity dollars they consume via activity drivers.

At the end of each phase managers will be able to use the results to begin to pursue improvement opportunities. Phase I helps to identify opportunities to improve processes and Phase II helps to see opportunities in the strategic position regarding what products or services are provided and/or for whom those services are provided.

The ABC journey begins with the ABC implementation project. The ABC implementation project has 4 major steps — which include the two phases of ABC model building:

1. project scoping and start-up;
2. costing activities (Phase I);
3. costing cost objects (Phase II); and
4. reporting.

Data gathering and documentation is one of the more challenging aspects of an ABC project. Data must be identified, located, understood, assessed for fit with scope and objectives (right time frame, completeness, etc.) and collected in a useful format. Assumptions must be documented. The information needed to do ABC comes from a wide range of areas, financial, personnel, and records of orders, calls, problems, in addition to self reporting of what activities are performed and percentage of time spent on each activity.

Designing the costing model is a critical stage in the implementation process. This is where the structure of the system is created and the intelligence added. It's the designer's job to meet the system objectives at a minimum cost and complexity. At the same time, the system should provide the right kind of information at the right level of detail.

It is useful to, during the early stages of the costing project, develop an initial paper based conceptual model showing how costs will be attributed to activities and how activity costs can be then attributed to cost objects. This conceptual model can then be enhanced and modified during the course of the project so that when it comes to entering data into the computer model plans have already been developed to handle any complex attribution issues.

4.0 The Benefits of ABC Information

4.1 Benefits

The key benefits associated with having access to activity based costing information are outlined below.

Understanding IT and Library

- Enhances the quality of management decision
 - Aligning costs to activities to more accurately establish prices
 - Linking cost to workload volumes & cost drivers
- Communicating a consistent message of how charges are calculated

Improving IT and Library Processes

Activity Based Costing

- Identifies how different student types consume costs
- Provides a consistent framework for comparison with internal & external benchmarks
- Utilises quantitative analysis to monitor progress
- Provides historical trend analysis to monitor progress

Improving IT and Resource Management

- Provide historical database for project estimating
- Better alignment of tasks & resources
- Fairly allocate resources across portfolio of services
- Identify process improvement opportunities

4.2 Project Schedule

The following Gantt Chart shows the overall project timing:

Project Phase / Stages	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
1 Project Start-up	■					
2 Costing Activities		■	■	■	■	
3 Costing Cost Objects				■	■	■
4 Reporting					■	■

4.3 Technology/Tools

The following technology and tools will be used for this project:

- EasyABC Plus
- Microsoft Suite
- Windows environment
- IBM environment

5.0 Project Deliverables

5.1 Process and Product Cost Model

Provide a cost model developed in EasyABC Plus (Windows-based software), which includes reporting capabilities for process, activities and divisions. The software solution provides update capabilities for structural changes and data updates for subsequent time periods.

5.2 Training & Communications

Document the knowledge transfer and communication initiatives incorporated into the workplan to train team members, develop awareness and secure buy-in from user groups.

5.3 Activity and Driver Definitions

Provide a dictionary with identification and definitions of all the activities and drivers used during analysis and development of the cost model. This dictionary is essential for ensuring consistency.

5.4 Knowledge Transfer to the Core Team Members on:

- ABC Methodology
- Activity Analysis

Activity Based Costing

- Driver Definition
- Model Structures

5.5 Improvement Opportunities Portfolio

Prepare a prioritised list of the improvement opportunities identified during the analysis and implementation of the ABC model.

6.0 Project Organisation

Ernst & Young's experience has shown that success is dependent on the organisations staff playing an active role. In developing the project approach and schedule, it is assumed that each university will commit a minimum of two full-time resources for the length of the project. These resources will work closely with E&Y resources to facilitate knowledge transfer.

The University of Newcastle resources and their commitment to the project are as follows :

- Project Sponsor - 2 hours per month (steering committee)
- Head of IT - 8 hours per month (steering committee and review of deliverable's)
- University Project Manager - full time (also on the steering committee)
- Activity analyst - full time
- Administrative assistant - as required, estimate 10 days effort during the course of the project
- Financial resource to provide cost information estimate 10 days effort during the course of the project

Ernst & Young project team members and their commitment to the project are as follows:

- E&Y Project Director- 1 day per fortnight (also on the steering committee)
- E&Y Project Manager - 4 days per week (also on the steering committee)
- E&Y ABC Model Designer - estimate 5 days effort during the course of the project

An assessment of university resource skills and project needs will be made at the end of each major milestone.

The principle ownership and responsibility for the pilot will rest with the University Project Manager and the consultants role will be one of guidance and support. A set of duties is outlined below.

6.1 Ernst & Young's Role

- Identify appropriate cost information required;
- Plan the various data gathering approaches and provide instruction;
- Manage the cost modelling process;
- Review data gathered;
- Develop the initial set of activities and cost objects;
- Review the model outputs; and
- Assist with preparing a report.

6.2 Role of University Staff

- Establish and manage milestones;
- Manage the project on a daily basis - including work environment, meetings and work structure;
- Access appropriate resources to work on the engagement;
- Capture cost information;
- Gather data on how much time people spend on various activities;
- Gather other cost driver information as required;
- Assist with developing the model;
- Prepare a report on the outcomes;
- Prepare progress reports; and
- Liaise with the project sponsor; and

6.3 Role Descriptions

Role	Description
Project sponsor	<ul style="list-style-type: none"> • Has ultimate authority over and is responsible for the project. • Approves changes to the scope and provides whatever additional funds those changes require. • Approves deliverables. • Participates in Steering Committee.
Engagement Partner	<ul style="list-style-type: none"> • Obtains necessary resources to deliver defined services. • Coordinates communication with management regarding engagement status. • Resolves intra-engagement issues arising from multiple project teams on engagements. • Ensures quality of outputs/results which meet the universities needs and delivers value.
Steering Committee	<ul style="list-style-type: none"> • Review and approve milestone deliverables. • Provide direction on project issues. • Ensure availability of resources, timely support and commitment.
E&Y Project Manager	<ul style="list-style-type: none"> • Provides ABC subject matter expertise. • Acts as Team Coach on issues. • Provides a single voice to the university project manager to streamline communications and avoid conflicting direction.
University Project Manager	<ul style="list-style-type: none"> • Principle ownership and responsibility for the pilot study. • Responsible for deliverables • Facilitate and organise all University of Newcastle resources and responsibilities • Acts as co-decision maker on conflict resolution. • Reviews and approves deliverables and work products. • Delegates day-to-day activity involvement to team members. • Manages executive relationship. • Delegates creation of deliverables and work products to team members.
Activity Analyst	<ul style="list-style-type: none"> • Assesses current processes and activities. • Determines activity drivers. • Documents and analyzes business processes. • Facilitates data gathering sessions. • Delivers presentations.
Administrative Assistant	<ul style="list-style-type: none"> • Inputs information into Issue Log and Change Request Log. • Generates Reports as needed for project management. • Creates documents, spreadsheets, presentations as needed. • Schedules meetings, conference rooms.
ABC Model Designer	<ul style="list-style-type: none"> • Designs model from user perspective. • Identifies cost data requirements. • Imports model structures. • Imports external data. • Develops ABC cost model. • Prepares ABC cost reports. • Documents cost model and drivers. • Reconciles model data input files.

6.4 Resources and Investment

The table below outlines our planned resources, their roles and the days effort for assisting the University of Newcastle with this exciting project.

Resource	Role	Day's Effort
Mr Robertson	Project Director	x
Ms Gipton	Project Manager	x
Ms Butler	Consultant - Knowledge/library specialisation	x
Mr McKay	Model designer	x
	Total	x

The cost associated with this engagement is \$xx for professional fees.

All expenses will be passed on at cost. On the basis that our travel, accommodation and meal costs do not exceed an average of \$xx per day, the estimate for these expenses is \$xx. However, we will be happy to work with the University to reduce this cost.

7.0 Project Management Approach

The project management approach is described below.

7.1 Project Control

- Each team member will track the time they spend for major activities on weekly timesheets.
- Actual time will be compared to the original estimates for the workplan.
- Project manager will document changes in projected completion time.
- Project manager will address productivity gaps or training needs for the project.

7.2 Issues Management Approach

Issue Definition: An issue is the formal documentation of an unexpected situation which normally does not require an update to the Project Charter. An issue is often constructed in the form of a question.

- All project issues, which will be identified by any team member, will be logged and tracked by the project manager.
- Issues will be assigned by the project manager to subject matter experts during weekly status meetings.
- Impacts to overall project timing or deliverables will be discussed with project directors during weekly status meetings.

If the project manager and directors cannot resolve an issue in a timely manner, alternative resolutions will be presented at monthly Steering Committee meetings; the Steering Committee will be responsible for selecting an alternative and closing the issue.

7.3 Scope Management Approach

Change Request Definition: A change request is an unexpected scope change that materially affects or changes the current Project Charter.

The difference between a scope change and an issue is that an issue must be dealt with by the project manager, project team or project director(s) so that the project can continue successfully. Issues affect the team's ability to meet scope. An issue can become a change request when an issue impacts scope, then a scope change request should be generated.

Activity Based Costing

- Any potential scope changes that are noted by the team members will be brought to the attention of the project manager and noted as **Change Requests**. Whether or not it is appropriate to allow an increase in scope will be discussed with the *Project Managers* and *Steering Committee*. Work will not occur until project timing impacts have been defined and approval to increase scope has been given.
- Weekly time reports will be used to track any increased efforts due to creeping scope, these will be addressed on a “case-by-case” basis to keep all team members on track.

7.4 Risk Management Approach

Risk Management strategies will be employed with contingency action plans in order to minimise the risks identified and assure timely, quality deliverables to meet the expectations and requirements of the client sponsor and user groups. Risks will be discussed on an ongoing basis during weekly status meetings.

The following project risks, strategies, and contingent actions have been identified:

Project Risk	Strategies and Contingent Actions
<p>Cost and Driver Data Unavailability Significant delays may exist for expected General Ledger department costs or transactional driver information to be input into the cost model.</p>	<ul style="list-style-type: none"> • Prepare the IT requests for cost information as early as possible. Begin by reviewing the format and types of cost data expected with IS. • Discuss with IT management any discrepancies between required information and the query information delivery. • Discuss with IT management possibility of providing direct access to information for selected core team members to using cost data queries.
<p>Cost and Driver Data Integrity General Ledger department costs or transactional driver information to be input into the cost model is not formatted properly or does not match other data sources.</p>	<ul style="list-style-type: none"> • Prepare the IT requests for cost information as early as possible by assigning a resource. Begin by reviewing with them the format and types of cost data expected. • Discuss with IT management any discrepancies between required information and the query information delivery.
Project Risk	Strategies and Contingent Actions
<p>Operations Resources Unavailability Resources needed for interviews/ facilitated sessions are unavailable during data collection timeframes.</p>	<ul style="list-style-type: none"> • Schedule meetings early and allow more time in estimates for schedule flexibility. • Make it clear to management when timeframes may be extended. • Make sure the schedule accurately reflects the availability of team members.
<p>Size & Complexity of Cost Model University activities and drivers entail significant complexity for analysis.</p>	<ul style="list-style-type: none"> • Check progress based on delivery of interim deliverables, assure management expectations with these interim deliverables.
<p>Core Team Resource Unavailability University resources may not be available for training and analysis on planned start date.</p>	<ul style="list-style-type: none"> • Increased project time, to allow for the reduction in productivity resulting from the insufficient availability of the necessary resources.
<p>Resource Skill Sets Lessons learned from previous engagement that</p>	<ul style="list-style-type: none"> • Increasing project time, to allow for the reduction in productivity.

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<p>only certain types of skills are transferable to client team members, while other general analytical and deductive reasoning skills must be inherent with the resource.</p>	<ul style="list-style-type: none"> • University resources will be matched with Ernst & Young team members to analyze and produce key deliverables.
<p>Experience as a Team Team members have not worked together as a team.</p>	<ul style="list-style-type: none"> • Allow more time in estimates for tasks in which the collaboration is critical. • Project Manager will provide on-the-job training when the need arises. • Arrange for team members to have training on contributing to a high performance team. • When possible, try to assign tasks and responsibilities based on the experience, technical skills, and interests of the team members. • Plan team-building activities. • Facilitate team development through planned meeting and clearly defined roles.
<p>Increased Scope for Activity Analysis or Object Costs During data gathering and detailed definition of cost objects, additional objectives or analysis requirements may arise.</p>	<ul style="list-style-type: none"> • Increase project time for all scope enhancements confirmed with a steering committee. • Make it clear to management when timeframes may be extended. • Establish a formal scope management procedure for the project using an issues-tracking format.
<p>Project Risk</p>	<p>Strategies and Contingent Actions</p>
<p>Non-Automated Driver Data Collection Once drivers are identified, it may become difficult to collect the data efficiently.</p>	<ul style="list-style-type: none"> • Deliver interim deliverables outlining the conceptual costing model and structure prior to developing the entire model in the EasyABC software. • Define approaches to collecting driver data moving forward. • Provide for extra quality review points (both process and product) to ensure that any problems are detected early.
<p>Information Delivery from Cost Model Stand-alone ABC model development means that reporting of product and process cost results will be distributed to end-users as paper reports.</p>	<ul style="list-style-type: none"> • Make this expectation clear to management early in the project, with the understanding that technology can be provided later to distribute the results. • Show paper reports to management and end-users early in the process in order to design the most effective report format and delivery.
<p>Methodology Experience Drawing from the costing methodology developed specifically for the Australian Higher Education sector</p>	<ul style="list-style-type: none"> • Ensure that key resources are allocated to the project as needed to meet all information needs. • Arrange for team members to have training on the chosen ABC methodologies. • Designate a cost model owner - university employee. • Ernst & Young involvement will enhance the use of the Costing methodology.

7.5 Quality Management Approach

In order to assure quality deliverables with a minimum of re-work, clear expectations will be defined for team members up front, and interim deliverables will be defined to confirm quality and progress along the way. In addition, the following review processes will be conducted:

7.6 Knowledge Transfer Approach

There will be a need to transfer knowledge between at least three groups for the ABC project. These three groups are University Areas (within scope), University Project Team Members and Ernst & Young Team Members. The knowledge transfer needs are depicted below with the current knowledge transfer strategy for each.

Knowledge	From	To	Transfer Strategy
ABC Methodology	Project Team	Uni. area	Initial introductory sessions, continued involvement during data collection and opportunity identification
Identifying Activities Defining Drivers How to Structure Models	EY	Project Team	Initial team training
Project Procedures Project Management Procedures Workplan Review	EY	Project team	Initial team training
ABC Model Development and Maintenance	EY	Project team	Model Development Training, Prior Model Examples

The following skills will **NOT** be part of the knowledge transfer approach and are assumed to be part of the skill sets of the project resources:

- Analytical Skills
- Deductive Reasoning
- Complex Problem Solving
- Interpretation of Model Results

7.7 Communications

Intra-team Communication will use the following methods:

- Weekly project team meetings
- Regular status reports with Project Managers
- Milestone Meetings with Sponsors and Steering Committees

Appendix A: Assumptions

The project plan, timing and resources are based on the following assumptions:

- university resources will be available to begin the project upon receipt of the project charter.
- university resources have the necessary skill set to complete deliverables and meet project timelines given the training set forth in this charter.

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- Information systems library and finance resources will be provided to locate, access and deliver cost and driver information in the proper formats based on requirements. IS and finance resources will assure the legitimacy and integrity of this data with the business unit responsible.
- The team will create a single cost model for university activities within the scope of this project.
- Resource information, such as actual cost per cost centre, is readily accessible from the general ledger.
- This study focuses on the identification of fewer than 100 activities.
- Driver information is available to drive activity costs to these major feature types.
- Cost object types are restricted to 20, ie faculties or divisions.
- The project will not develop the data and technology architecture for the enterprise-wide ABC solution.

Appendix B: List of Project Participants

Project Participants

Steve Robertson	Ernst & Young – National Director (Higher Education)
Sara Gipton	Ernst & Young – Project Manager
Gary McKay	Ernst & Young – ABC Modeler
Trevor Gerdson	Project Manager, IESD
Brian Evans	Project Team, IESD
Julie Gibson	Project Team, IESD
Jim Cleary	Project Team & Executive Research Officer, IESD
Linda O'Brien	Executive Director, IESD
Greg Anderson	Program Manager, Information Resources, IESD
Marion Wilson	Information Resources
Sharon Howells	Information Resources
Kirsten Neilson	Information Resources
Mark Piper	Program Manager, IT Infrastructure, IESD
Doug Kaiser	IT Infrastructure
Tony Nicholson	IT Infrastructure
John Hendricks	IT Infrastructure
Brian Clarke	Program Manager, Information Systems, IESD
Paul Hughes	Information Systems
Robert Nicol	Information Systems
Peter Sidorko	Program Manager, Client Services, IESD
Grant Collin	Client Services
Patrick Murphy	Team Leader, Learning & Development, IESD
Geoff Barcan	Manager, Web Team, IESD

Steering Committee Membership

Christina Murdoch	Director, Financial Services Unit
Professor David Finlay	Dean, Faculty Science & Mathematics
Mark Piper	IT Infrastructure
Peter Sidorko	Client Services
Greg Anderson	Information Resources
Jim Cleary	Learning & Development
Linda O'Brien	Executive Director, IESD
Trevor Gerdson	Project Manager
Julie Gibson	A/ Business Manager, IESD
Brian Evans	Executive, IESD

Appendix C: Activity Dictionary

Activity Reference No.	Activity	Definition
CS 1	Providing assistance at the Information Desks	<p>Providing comprehensive reference service for Library users and members of the University community as well as providing support for the University Computing Laboratories and associated IT services for staff and students of the University.</p> <p>The reference service includes instruction in the use of the Library catalogue, database, print and electronic resources; assistance with research needs by identifying relevant subject-based resources; and the provision and direction of users to guides, publications, help sheets and documented instructions. Bibliographic verification of citations and source material, advice on search terms and strategies for literature searching, assistance with accessing resources remotely is also provided.</p> <p>Basic assistance with the University computing facilities and services including: electronic mail services, printing facilities, on-campus network access, remote access, use of computer laboratories, word-processing, spreadsheets and Internet-browsing help. Provide passwords for computing access as well as access to databases & electronic journals. Information and registration/bookings for IT and Library training sessions.</p>
CS 2	Providing consultancy services to assist teaching, learning and research	<p>Consultancy services are primarily available through the Faculty Librarians and include intensive instructive sessions focussed on an individual academic or postgraduate's research interests and teaching commitments. This service will most often be provided on a one-to-one basis but may also be provided to small groups with similar interests.</p> <p>Consultation services are provided to specialist groups including remote and international students and are also included here.</p>

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CS 3	Preparing self-help tools and guides	Developing, editing, maintaining and distributing guides, publications, help sheets and documented instructions. Web access is provided wherever possible.
CS 4	Planning and design of curriculum - based information skills	Identifying the need for information literacy skills training, addressing relevant faculty committees (teaching, board etc.) on the significance of such skills and the specific needs within the faculty, developing a proposal for faculty consideration, designing the content of the course and negotiating with faculty for the most appropriate timeframe for introducing such a course. It also includes the creation of course materials, assessment tasks, web pages and any other matter related to the course design. This activity is primarily provided by the faculty librarians and involves close consultation with academic staff in embedding information literacy skills training within the curriculum.
CS 5	Planning and delivery of orientation generic information skills program	Planning and delivery of “generic” (e.g. Internet, databases, endnote, word, and student mail) training sessions to clients independent of their faculty affiliation is also included within this activity. This planning and delivery include advertising through brochures, newsletters, flyers and posters as well as registration of participants and the production of supporting documentation in the form of manuals and handouts.
CS 6	Delivery of curriculum-based information skills	The delivery of the material planned and developed in collaboration with Faculty. It includes organising teaching spaces, face to face teaching through lectures or tutorials, consulting with students in relation to the delivery and content of the course, as well as the marking of any assessment related to the course.
CS 8	Managing access to electronic information resources	System planning and management, liaison with computing systems providers (both local and remote) regarding implementation, upgrades and enhancements to the services; negotiating licences and managing access according to licence requirements. Interfaces to on-line information resources are developed. Liaison with information service staff on the use of systems to support users of the electronic resources is provided.

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CS 10	Providing a referral service for clients to IESD	Referral services to IESD through Information Desks, Desktop Support services and Faculty Librarians.
CS 11	Resolving computer problems	Telephone and face to face support for clients with software and hardware problems.
CS 12	Planning the management and implementation of significant software installations	IESD installs software on computers across most faculties and divisions including the Corporate Systems Coordination Group.
CS 13	Deploying and providing software & management of site licence obligations.	Providing a mechanism for efficient software and secure deployment installation. Software is provided to the University and to staff and students at the lowest possible cost.
CS 14	Advising clients on use of hardware/software	General recommendations to staff to satisfy their computing needs. Desktop Services and Software Sales staff aids the Purchasing Department in the supply process by advising on technical reasons for buying outside the University recommendations.
CS 15	Managing desktop computer standards	Strategic site licences are negotiated for the University and software purchases by departments monitored. A standard PC hardware configuration and set of software for use across the entire University is created.
CS 16	Scheduling Computer Laboratory use	IESD manages the process of allocating computer Laboratory resources. Bookings are negotiated and conflict resolved.
CS 18	Evaluating divisional services	Using evaluation tools created by the division to monitor the services provided. This includes receiving, monitoring and responding to feedback on the division, each program and individual teams. The development and distribution of divisional surveys and responding to University-wide student surveys (such as the CSQ).
101	Planning, Policy and Development	Tasks associated with development of Program level plans, including budgets and management plans, input and contribution to the Divisional strategic planning process, the Infrastructure Plan process, and any other contributions to Divisional or University-wide planning or coordination activities, such as membership of University committees within the scope of the Program's

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		activity and development of university policy and procedures.
102	Supporting Strategic Partners	The process of liaison, negotiation and management of services provided to or provided by a strategic partner of the University.
IDP 1	Y2K project	Year 2000 preparation, planning and remediation.
IDP 2	Maintaining Administrative systems	Central costs for maintenance agreements on major corporate information and administration systems.
IDP 3	Implementing HR system	Project activity associated with the implementation of the new HR corporate system.
Library	Providing information resources	Accumulates the annual University book-vote and depreciation.
Library	Providing access to Library buildings	Inserted in the model to apportion buildings costs at the central level, such as power and heating, depreciation, insurance, maintenance and so forth.
Library	Providing access to library collections	Inserted in the model to apportion costs at the central level associated with the book collection, such as non-capitalised purchases (Book Vote) and depreciation on the collection.
Library	Student photocopying	Activity directly related to the provision and servicing of student-access photocopiers, including trouble-shooting faults, re-stocking with paper, demonstration to users.
IR 1	Providing short loans - processing	Processing a list of items requested to be placed in the Short Loans Collection by academic staff; retrieval of items from shelves; adjusting Library system records to indicate the item is in the Short Loans Collection; physically marking/packaging the items for use.
IR 2	Receiving and Paying for information resources	Matching items received against an invoice; entering a received date in the order record; passing the invoice for payment in INNOPAC; preparing the paperwork for cheques to be raised by Finance.

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IR 3	Processing returns	Cancelling the loan record in the Innovative system; re-sensitising the item and directing material to relevant areas as required, e.g. reading rooms, hold shelves, in transit to other libraries etc.
IR 3	Providing short loans - providing	Answering enquiries, lending items, returning items, shelving, instructing, etc.
IR 4	Lending information resources : self-check	Process by which the students borrow Library items using 3M self-check equipment (automated borrowing facility).
IR 5	Lending information resources - over the counter	Library staff directly placing items on loan to individual patrons in the Library system.
IR 6	Lending equipment	The process of lending AV and other equipment to staff and students through a library service point.
IR 7.1	Renewing information resources	The process of re-borrowing items already on loan to patron.
IR 8.1	Providing inter library services – incoming	The process of lending/copying items from our collection for dispatch to other libraries.
IR 8.2	Providing inter library services - outgoing	The process of requesting loans or copies of items not held by the University Library from other libraries or sources, for use by our patrons.
IR 8.3	Providing inter library services - intercampus	The supply and receipt of photocopies or items for loan, which have been requested by individual patrons, between the University's Libraries.
IR 9	Shelving information resources	The process of sorting items into collection areas, physically transporting items to a collection area, and placing items in order on shelves.
IR 10	Answering lending enquiries	Addressing patron requests for information such as: directions to particular areas within the building, fines, missing books, claimed returns, borrower registrations, photocopier cards, etc.

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IR 11	Ordering Information Resources	Upon receipt of an order request either by internal mail or e-mail, investigation of any other additional information required for ordering; allocation of fund codes and vendor code; checking the on-line catalogue for duplication; checking on KINETICA for bibliographical records; downloading a bibliographic record or keying the record if none available; attaching order record; assigning vendor/supplier – sending order. Carrying out follow up procedures to ensure that it does arrive in the Library.
IR 13	Accessioning – end processing of information resources	Matching items received against the order; entering the received note in order record; writing order number on item.
IR 13	End processing	Stamping, labelling, tattle-taping and providing quality control of items received.
IR 14	Binding information resources	The process of compiling loose issues into one bound volume. This entails: electing items for binding; preparing binding slips and amending records; sending items to Bindery; quality control and checking in items on return from Bindery.
IR 15	Cataloguing information resources - original	Creating new records in KINETICA and downloading the records into NEWCAT.
IR 16	Cataloguing information resources - copy	Checking items in hand against record, adding item record and barcode, assigning call numbers.
IR 17	Maintaining Library system	Loading new library modules; running daily files; providing general maintenance, including upgrades to the new releases.
IR 19	Maintaining, processing and providing access to Research archives	Maintaining, processing and providing access to research archives includes appraisal of archives and manuscript collections offered to the University for research use; preparation of word processed finding aids;* provision of access and research support; management of privacy and, where appropriate, consultation with indigenous peoples on access. Notable manuscripts and all (word processed) finding aids and research guides are being digitised and published on the ARBSC Website.

*[NOTE on Costs: Use of word processed finding aids has significantly contained costs in managing and making accessible Research

Archives. The cost of word processed (relatively simple) finding aids for these (comparatively small) research collections is about 15% (fifteen percent) the cost of using a conventional archives database, as would be needed for a large, complex, in-house University archive. (A 'Comparatively small' research archive collection means up to a maximum of about 200 shelf metres for each individual collection. By distinction, a typical large in-house University archive now exceeds 1,000 shelf metres.)]

IR 20	Maintaining and providing access to rare books and special collections	Maintaining and providing access to Rare Books and Special Collections includes selection and acquisition of rare books; preservation, conservation, soliciting cash donations for restoration work and arranging restoration of rare books; provision of access and research support; regular stocktaking of rare books and special collections; and preparing evaluations for insurance purposes.
IS 1	Participation in evaluating and implementation of packaged solutions	Evaluating solutions by researching what is available in the market place, contributing to the specification of user requirements which form the basis for calls to tender, participating in the evaluation of tender submissions and negotiating with tenderers on the final contract. Working with contractors and users during implementation to analyse how the selected solution will be tailored to meet local needs, creating application databases, installing application software, setting up test data, testing the application, planning migration from existing system(s) to the new system and migrating to the new system.
IS 2	Maintaining and supporting packaged corporate systems	Running procedures to modify system databases as well as implementing new system code. Support also includes the implementation of additional modules that may include all the activities associated with system implementation, and installing patches and upgrades. Fielding requests which arise from issues and problems with the system. These requests entail investigating the cause of these issues and problems, liaising with solution providers and taking any remedial action that may arise.

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IS 3	Analysing, designing and developing in-house corporate information solutions	Systems analysis entails liaison with end users to specify their needs. Solution design requires the review of alternative development approaches and selection of the most appropriate tools to meet the needs, the design of system databases and the design of the user interfaces. Development consists of creating the system databases and writing code to implement the interfaces, testing the developed system and implementing it for adoption by the users.
IS 4	Maintaining and supporting in-house corporate information solutions	These activities are very similar to maintaining and supporting packaged solutions except that the Information Systems Program undertakes all remedial activities and enhancements.
IS 6	Evaluating, implementing and supporting <i>ad hoc</i> reporting tools for desktops	A number of desktop application tools are available for this purpose. The evaluation and implementation of these tools are similar to the activities for packaged systems, but also entails background work to provide appropriate access to the data tables and the fielding of inquiries regarding more difficult data extractions.
IS 7	Monitoring and planning for the growth of all corporate information systems	New systems require estimates of the resources required, followed by close scrutiny of actual implementation to ensure that these estimates correspond to actual use. Once implemented, systems tend to grow in the number of users accessing a system and the size of the databases. This rate of growth needs to be monitored and additional hardware installed when required.
IS 9	Managing Computer Laboratories	IESD ensures Computer Laboratories are stable and functional. Staff and students are assisted with the use of the laboratories. Posters, procedures and handouts for lab usage are created. Future directions for laboratories are planned.

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IT	Operational – IT only	Unique driver created to represent time devoted to operational activities by the IESD Executive Director.
IT 1	Providing user support for presentation facilities	Responding to requests for assistance regarding the University's presentation facilities. Typically involves giving advice on usage and resolving ad hoc equipment faults for academics in lecture theatres and classrooms.
IT 2	Maintaining presentation facilities	Undertaking routine maintenance of presentation equipment within teaching venues. Typically involves checking/ replacing projector lamps and checking operation of other equipment.
IT 3	Developing presentation facilities	Providing new presentation facilities within the University's teaching venues, includes major upgrades/replacement of old equipment. Typically involves installing a standard configuration of equipment so that academics have consistency between venues.
IT 4	Maintaining specialised electronic equipment	Providing technical support for a variety of electronic equipment that does not fit neatly within other activities. Typically involves technical support for student id-card system and various equipment used in the libraries; advice on and repairs to audiovisual equipment; does not include staff desktop support.
IT 5	Creating and maintaining user accounts	Providing staff and students with electronic access to infrastructure resources and services. Typically involves establishing procedures, processing requests for access and deleting old users.
IT 6	Managing central computer infrastructure operations	Monitoring and controlling the operation of central computer systems to ensure services levels are adequate and are apportioned appropriately to staff and students. Typically involves continuous monitoring of system activity; responding to resource shortages and to inappropriate usage of the systems; managing backup tapes and central print jobs.

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IT 7	Maintaining central computing infrastructure	Undertaking hardware and software maintenance of the central computer systems to ensure they are able to perform adequately and reliably. Typically involves regular installation of software patches and upgrades; scheduled and <i>ad hoc</i> hardware maintenance.
IT 8	Developing central computing infrastructure	Providing new central computing facilities, including major upgrades/ replacement of old equipment. Typically involves planning, procurement, installation and setup of systems, often as part of a larger corporate information system project.
IT 9	Maintaining computer labs	Undertaking hardware and software maintenance of the computer labs to ensure they are able to perform adequately and reliably. Typically involves <i>ad hoc</i> requests from academics for software installation; scheduled and <i>ad hoc</i> hardware maintenance.
IT 10	Developing computer labs	Providing new computer lab facilities, including major upgrades/replacement of old equipment. Typically involves planning, procurement, installation and setup of equipment.
IT 11	Installing and maintaining telephone connections	Responding to <i>ad hoc</i> requests for new telephone extensions, for existing extensions to be moved and for resolution of faults on individual extensions; includes.
IT 12	Providing telephone directory services	Providing a first-point-of-contact for incoming calls on the main University number and forwarding calls to internal extensions as needed. Placing long distance outgoing calls from barred internal extensions.
IT 13	Managing telephone system operations	Monitoring and controlling the operation of the telephone system (PABX, LIMs and voicemail system) to ensure services levels are adequate and are apportioned appropriately to staff and students. Typically involves regular monitoring of system activity; responding to resource shortages and to inappropriate usage of the systems.

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IT 14	Maintaining telephone systems	Managing hardware and software maintenance of the telephone system (PABX, LIMs and voicemail system) to ensure they are able to perform adequately and reliably. Typically involves regular installation of software patches and upgrades; scheduled and <i>ad hoc</i> hardware maintenance; maintaining the cable plant.
IT 15	Developing telephone systems	Providing new telephone facilities, including major upgrades/ replacement of old equipment. Typically involves planning, procurement, installation and setup of systems. Where done as part of a capital building project the costs are born by that project.
IT 16	Installing and maintaining data network connections	Responding to <i>ad hoc</i> requests for new data connections, for existing connections to be moved and for resolution of faults on individual connections.
IT 17	Managing data network operations	Monitoring and controlling the operation of the data network to ensure services levels are adequate and are apportioned appropriately to staff and students. Typically involves continuous monitoring of network activity; responding to resource shortages and to inappropriate usage of the network; managing higher-level network services including DHCP, DNS, e-mail, news, web cache.
IT 18	Maintaining the data network	Undertaking hardware and software maintenance of the components of the data network to ensure they are able to perform adequately and reliably. Typically involves regular installation of software patches and upgrades; scheduled and <i>ad hoc</i> hardware maintenance; maintaining the cable plant.
IT 19	Developing the data network	Providing new data network facilities, including major upgrades/replacement of old equipment. Typically involves planning, procurement, installation and setup of systems. Where done as part of a capital building project the costs are born by that project.
IT	Providing access to IT facilities	Inserted in the model to apportion buildings costs at the central level, such as power and heating, depreciation, insurance, maintenance and so forth.

Activity Based Costing

LD 1	Design and develop IT training programs	Design training programs and develop learning materials. Design and conduct evaluation of training programs.
LD 2	Deliver IT training Workshops	Register participants, prepare copies of participant materials, set up training labs and install software, deliver training and assess participants.
WT 1	Developing Web-based applications for the University	The development of applications with a web interface to a database. The range of applications includes intranet development within the University; custom systems in support of flexible learning requirements and general use applications (internal and external) such as exam results, accommodation and classroom timetables on the Web. This activity also includes the maintenance of the technical infrastructure for the web development applications (e.g. server maintenance, coding standards, liaison with database administrators etc).
WT 2	Developing Web-sites	The development and maintenance of (static) web-sites. Static web-sites are differentiated from sites where the content is stored in a database. Includes maintenance of the University's external Web site.
WT 3	Providing leadership, coordination and support for University Web - sites.	Web policy development and administration, and provision of technical advice and support for sub-sites. Support includes phone and e-mail enquiries, user registration for flexible-learning software, management of the University's search engine and a number of central services such as log file analysis, link checking and responding to "webmaster" e-mail from external users.
IS (deleted from final study)	Providing technical advice on information systems and responding to enquiries	Discussing and determining specific needs of University staff pertaining to information systems, researching possible solutions and reporting back.
Embedded in IR 12	Receiving information resources	Checking items in a parcel against the invoice; photocopying the invoice; shelving of items in Bibliographic Services.

Activity Based Costing

Division-wide **Providing and implementing a**
activity within **quality assurance framework**
CS

Establishing a framework to ensure clients receive consistently high quality levels of service at Information Desks or through other forms of communication (including telephone and e-mail). Continuous improvement and ensuring on-going staff commitment to the Quality Assurance process ; Regular review of the Quality Assurance process.

Appendix D: Activity Drivers

ACTIVITY	ACTIVITY DRIVER
ADMINISTRATIVE SUPPORT AND IESD EXECUTIVE	
Operational – IT only	EFT
Planning, Policy and Development	Evenly assigned
GENERIC	
Providing and implementing a QA framework	EFTSU
Preparing Strategic Plans and Budgets	Evenly assigned
Supporting Strategic Partners	Direct – strategic partners
IT TRAINING (LEARNING & DEVELOPMENT)	
Deliver IT training workshops	Total number of participants in training sessions
Design and development of IT training programs	Total number of participants in training sessions
WEB DEVELOPMENT TEAM	
Developing and maintaining Web applications	Number of Web applications developed (weighted for complexity)
Leadership, Coordination and Support for Web Sites	Number of Web Authors
Developing and Maintaining Web Sites	Number of Web Pages (weighted)
<i>CLIENT SERVICES</i>	
Providing assistance at information desks	Number of enquiries
Providing consultancy services to assist teaching and research	Number of consultations
Preparing self help tools and guides	Number of tools and guides developed
Preparation and design of curriculum information skills sessions	Number of courses
Planning and delivery of orientation and generic information skills programs	Number of consultations
Delivery of curriculum based information skills programs	Number of courses
Selecting and evaluation of new and continuing information resources	Number of resources
Managing access to electronic information resources	Number of guides and tools developed per faculty
<i>Providing a referral service for IESD</i>	Number of enquiries
<i>Resolving computer problems</i>	Number of enquiries
<i>Planning, management and implementation of significant software installations</i>	Number of major projects
<i>Deployment and provision of software</i>	Number of requests and site licences
<i>Advising clients on use of hardware and software</i>	Number of enquiries

<i>Managing desktop computer standards</i>	Number of PCs
Scheduling Computer Lab Use	Number of bookings
Managing Computer Labs	Number of classes
Evaluating Divisional Services	EFTSU by faculty
<i>INFORMATION SYSTEMS</i>	
Participate in evaluation and implementation of packaged software solutions	Number and complexity of systems
Maintain and support packaged corporate systems	Number of requests for support
Analyse, design and develop in-house corporate information systems	Number of requests
Maintain and support in-house corporate information systems	Number of requests
Evaluate and implement ad hoc reporting tools for desktops	Number of requests
Monitor and plan for growth of all corporate information systems	Rate of growth
<i>IT INFRASTRUCTURE</i>	
Providing user support for presentation facilities	Number of bookings
Maintaining presentation facilities	Number of venues
Developing presentation facilities	Number of venues
Maintaining specialised electronic equipment	EFTSU by faculty
Creating and maintaining user accounts	Number of accounts
Managing central computer infrastructure operations	Number of accounts
<i>Developing central computing infrastructure</i>	Number of projects
Maintaining central computing infrastructure	Number of systems
Maintaining computer labs	Number of lab classes
Developing computer labs	Number of lab classes
Installing and maintaining telephone connections	Number of new connections
Providing telephone directory services	Number of total connections
Managing telephone system operations	Number of extensions
Developing telephone systems	Number of projects
Maintaining telephone systems	Number of extensions
Installing and maintaining data network connections	Number of data connection requests
Managing data network operations	Number of data connections
Maintaining the data network	Number of data connections
Developing the data network	Number of data connections

Activity Based Costing

Providing access to IT facilities	EFT
<i>INFORMATION RESOURCES</i>	
Providing access to library collections	EFTSU by faculty
Providing access to library buildings	EFTSU by faculty
Lending short loans	Number of items used
Lending equipment	Number of loans
Maintaining library systems	EFTSU by faculty
Cataloguing - Copy	Number of copy items catalogued
Cataloguing - Original	Number of original items catalogued
Answering lending enquiries	EFTSU by faculty
Binding – Monographs & serials	Number of volumes bound
Accessioning and end processing information resources	Number of items added
Ordering information resources	Number of purchase orders
Processing short loans	Number of short loans placed in collection
Processing returns	Number of returns
Lending information resources – self check	Number of items self-checked
Lending information resources – over the counter	Number of items lent - over the counter
Processing information resources - renewals	Number of renewals
Processing information resources – self renewals	Number of renewals
Providing inter library services - incoming	Evenly assigned
Providing inter library services - outgoing	Number of requests out
Providing inter library services – inter campus	Number of requests across campuses
Shelving information resources	Number of items returned
Receiving and paying for information resources	Number of items received and paid
Maintain, process and provide access to University archives	Number of archive items processed
Maintain, process and provide access to research archives	Number of enquiries received
Maintain, process and provide access to rare books and special collections	Number of enquiries received
<i>INFRASTRUCTURE DEVELOPMENT</i>	
Year 2000 Project	EFT by faculty and division
Maintaining administration systems	Number of administration information systems
Implementing HR system	Evenly assigned
Student Photocopying	EFTSU

Appendix E: Model Assumptions—Activities

IR 1 Processing Short Loans

As the majority of items placed in the Short Loan collections for 1999 had been withdrawn when ABC occurred, a manual review of the 1999 reading lists for the Auchmuty and Huxley Short Loan collections provided figures for the numbers of items placed in these collections during 1999. Estimates were obtained from the other service points. The number of items processed was divided by Faculty using information collected from the reading lists.

IR 2 Lending Short Loans

The number of items used was derived using loan and internal usage statistics from the INNOPAC system. In Auchmuty, internal usage statistics were not collected beyond September, so an estimate was taken using data averaged out over the same period in 1998. Reserve loans lent via the Music, Law, Biomedical and Curriculum/AV areas are tracked by INNOPAC. Manual loans statistics have been included as applicable.

IR 3 Processing returns

The number of items returned or checked in as reported by the INNOPAC system for 1999 across the specified locations.

The number of items returned or checked in was sorted was based on the assumption that the number of loans by Faculty would be identical to the number of items returned.

IR 4 Lending information resources (self check)

The number of items lent using the 3M Self-check units is recorded on the INNOPAC system for the Auchmuty and Huxley Libraries. The number of self-charged loans was divided by Faculty. The percentage of usage was calculated using the combined number of loans across the counter and self-check, as it was not possible to obtain a breakdown separately.

IR 5 Lending information resources (Across the counter)

The number of general loans charged out by staff in the Auchmuty, Huxley and Music Libraries was derived from the INNOPAC system. This would include audiovisual and curriculum items borrowed using a general loans desk, but would not include Reserve collection items as they are included under Activity 2 – short loans.

The number of across the counter loans was divided by Patron type and Faculty. The percentage of usage was calculated using the combined number of loans across the counter and self-check, as it was not possible to obtain a breakdown separately.

IR 6 Lending equipment

The number of equipment loans, a service provided by the CRMC, was derived using item level circulation data from the INNOPAC system. The number of equipment loans was divided by Patron type and Faculty as tracked by the INNOPAC system.

IR 7.1 Processing self renewals

Patrons have an option to renew their loans by accessing their patron record via the Library's catalogue (OPAC) system. INNOPAC tracks self-renewals by terminal location. The number of self-renewals processed by OPAC terminals was grouped by library. Patrons can also renew their loans via an external login. These figures have been included.

The number of self-renewals was divided into Patron type and Faculty. The percentage of usage was calculated using the combined number of renewals over the counter and self-renewals as it was not possible to obtain a breakdown separately.

IR 7.2 Processing over the counter renewals

A loan renewal service is also available from a service point, with the majority of renewal requests being received via the telephone. Loan renewal statistics for each service point have been derived from the INNOPAC system.

The number of self-renewals was divided into Patron type and Faculty. The percentage of usage was calculated using the combined number of renewals over the counter and self-renewals as it was not possible to obtain a breakdown separately.

IR 8.1 Providing Inter Library Services : Incoming requests

The library received requests for the supply of items to other libraries as part of the national resource-sharing network. The number of requests received from other libraries by the centralised Inter Library Services unit is included.

The direct consumers of this activity are other libraries. This cannot be assigned to faculties or other internal cost objects as the request is generated by another institution, and is part of reciprocal agreements between libraries. It might be argued that internally, those faculties who rely on ILL benefit from the reciprocal nature of the arrangement, but the cost of these ILL is recovered and therefore not deleting funds available for internal clients.

IR 8.2 Providing Inter Library Services : Outgoing requests

Material held elsewhere is obtained for staff and students through the Inter Library Service unit. Material is sourced from other libraries as well as commercial document suppliers. The number of requests sent during 1999 is included.

The number of requests was broken down by Faculty.

IR 8.3 Providing Inter Library Services : Inter Campus Requests

The library offers an inter campus request service allowing staff and students to request items from a collection on one campus to be sent to a pickup location of their choice. In 1999, the service was available between the Callaghan, Central Coast, Conservatorium of Music and Renwick College campuses. Requests for books are processed via the INNOPAC system, whereas requests for articles are received via fax. Manual statistics are collected by the library that fulfils a request and these statistics are not accurate and do not reflect the type of request e.g. at the book or article level. The figure includes the number of requests processed, both incoming and outgoing by the Auchmuty Inter Library Services unit.

IR 9 Shelving Information Resources

The number of items reshelved was estimated by taking the number of items checked in from the INNOPAC and doubling the figures on the assumption that for every item borrowed, another item is used within the library and has to be reshelved. As the majority of our serials are not borrowed, we suspect that we have underestimated this figure and should use a 2:1 ratio i.e. 2 items used in-house for every item borrowed. Reshelving statistics are included across all service points.

The number of items returned or checked in was sorted on the assumption that the number of items reshelved would be identical to the number of items borrowed.

IR 10 Answering lending inquiries

The Loans desk handles hundreds of inquires per day via the telephone and by person. Up until 1997, manual statistics were kept on the following inquiry categories in the Auchmuty and Huxley Libraries: Catalogue inquiries (basic), Claimed returned/never borrowed; Directional/Orientation; Eftpos; Fines inquiry and Overdues; Holds; Lost cards; Lost Property; Miscellaneous; Missing books; Registration; Phone renewals; Value teller. Collection of loans inquiry statistics was discontinued in 1997 due to the high level of inaccuracy and time required to collect the statistics. In the absence of any other data, the 1997 figures have been used plus 20% to "guestimate" 1999 activity levels.

The number of lending inquiries was divided by patron category assuming that the number of inquiries would be similar to loan activity by patron type.

IR 11 Ordering information resources

A list of orders entered into the INNOPAC system within the date range of 1/1/99 and 31/12/99 was created. This generated the number of orders placed for new materials for 1999. A statistical report was created on the Fund Code (orders and costs by Faculties) to indicate the number of orders placed by Faculty, multidisciplinary and the Central Coast.

Type of information resource ordered has no impact upon the cost of this activity.

IR 12 Receiving and paying for resources

Assume that books and serials require the same amount of resources.

Book/Non Book:

A list of items received and entered into INNOPAC within the date range of 1/1/99 and 31/12/99 was created. This process also identified the number of items i.e. copies that were received and paid for. This information was divided by Faculty, multidisciplinary (general collection) and the Central Coast.

Serials:

The number of subscriptions for 1999 was taken from the INNOPAC system. This includes the number of Invoices paid for 1999 subscriptions. This information was divided by Faculty, multidisciplinary (general collection) and the Central Coast.

IR 13 Accessioning and end processing

Book/Non Book:

The number of items added to the collections included the number of monograph volumes, audiovisual items, parts of kits etc. The statistics include the number of donated items. These items were identified by creating an item report on INNOPAC with NOTE HAS Donation 1999. This information was divided by Faculty, multidisciplinary (general collection) and the Central Coast based on the percentage of items received and paid for (Activity 12).

Serials:

The number of serial issues checked in using the INNOPAC serials module are included. The data was collected by creating a report of serial issues received within 1/1/99 and 31/12/99 : BOX STATUS = A (Arrived) and TRANSACTION DATE within 1/1/99 and 31/12/99. This information was divided by Faculty, multidisciplinary (general collection) and the Central Coast.

IR 14 Binding monographs and serials

The number of items bound was derived using a manual stock count.

Binding lists (Dewey numbers) used to calculate binding done for Faculties and the multidisciplinary (general) collection. Binding data for the Central Coast is not included.

IR 15 Cataloguing (original)

If a catalogue record cannot be found on the KINETICA database, according to current practice, a full catalogue record is created and added to the KINETICA database by Bibliographic Services staff. Unfortunately, the number of items added could not be accurately extracted from KINETICA so an estimate was provided. It was assumed that 10% of items received, whether purchased or donated, required original cataloguing.

The data was divided by Faculty, the multidisciplinary (general collection) and the Central Coast according to the origin of the order.

IR 16 : Cataloguing (copy)

Existing catalogue records are identified on the KINETICA database and downloaded into our local INNOPAC system. It was assumed that 90% of items received during the year, whether purchased or donated, required copy cataloguing.

The data was divided by Faculty, the multidisciplinary (general collection) and the Central Coast according to the origin of the order.

IR 17 Maintaining library systems

The maintenance and development of the library's online library management system, INNOPAC, is supported primarily by a systems officer. The position's responsibilities include loading of external files and data, problem diagnosis and reporting, liaison with the supplier (Innovative Interfaces) and partners, training, enhancement application and documentation as well as investigation and implementation of system functions. The number of enquiries and major tasks undertaken for 1999 was estimated.

The number of functions added or inquiries was divided by internal (library staff initiated including the Central Coast) and by Faculty.

IR 18 Processing University archives

The number of items processed was estimated by averaging the number of items per shelf metre and multiplying this by the number of shelf metres processed in 1999. This activity is not a library or IT related activity and the dollar costs associated with it should be deleted from any totals accumulated out of this study.

IR 19 Supporting archival research activities

This includes the number of requests received. These inquiries could not be broken down by Faculty or Patron type. The data was divided into 4 broad categories:- Division; Faculty; Student and other.

IR 20 Processing rare books and special collections

The number of rare book items received, catalogued and added to the Rare book collection. An estimate of collection usage was provided by Faculty and student type.

CLIENT SERVICES

CS 1 Providing assistance at information desks.

This activity incorporates assistance to library users as well as an initial point of contact for IT services and computer labs. The total activity cost has not been apportioned across IT and library.

Though classified as unique, this driver was used to cover four distinct activities:

- i. Low level resolution of computer problems
- ii. Assistance at information desks
- iii. Referral to other areas of the Division
- iv. Advice on use of hardware

Four different sets of driver data were combined and apportioned within this activity. Driver data was based on 1998 estimates.

CS 2 Providing consultancy services to assist teaching and research.

Includes services to remote and international students. Based upon an estimate of 45 minutes per consultation.

CS 3 Preparing self help tools and guides.

Includes distribution of these. Preparation of guides and tools is assumed to be evenly weighted activities.

CS 4 Planning and design of curriculum based information skills.

No assumptions noted underlying this activity.

CS 5 Planning and delivery of orientation and generic information skills programs.

Includes planning, promotion and production of associated documentation. Average of 10 students for a 1-hour class or session.

CS 6 Delivery of curriculum based information skills.

Average of 10 students for a 1-hour class or session.

CS 7 Selecting and evaluating new and continuing information resources.

Includes liaison with faculties. This activity required liaison with Information Resources Program, which generated individual information on resources.

CS 8 Managing access to electronic information resources.

The number of guides and tools prepared (activity 3) was used as the driver as there was felt to be a correlation between the size and complexity of the guide, and the number of

electronic information resources managed. A total of 114 electronic information resources are presently managed.

CS 9 Providing short loans.

This activity was merged with the IR activity.

CS 10 Providing a referral for IESD.

A general service for the whole Division, and will therefore include some non-IT or library related referrals and activity.

CS 11 Resolving computer problems.

Includes telephone and desktop support.

CS 12 Planning management and implementation of significant software installations.

No assumptions noted underlying this activity.

CS 13 Deployment and provision of software.

Includes management of site licences. 4081 licences issued in 1999 by Software Sales. 3706 to Departments, 375 to students and 18 site licences.

CS 14 Advising clients on use of hardware and software.

Includes direct advice where departments may be buying outside of University recommended solutions.

CS 15 Managing desktop computer standards.

Includes negotiation of site licences.

CS 16 Scheduling Computer Lab Use.

No discrimination was made between a one hour booking for a single session or a three-hour booking for a term, on the basis that the management of the booking was not related to this factor

CS 17 Managing Computer Labs.

Classes were not identified as of different length, but were assumed to be separate occurrences or bookings for separate times. The general access labs are basically full from 9-5 (at least) each day of the semester (so 30 weeks including exams). There is no break down by faculties for general access usage, but is assumed that it would be fairly close to the same as the break down for bookings. Only difference being a drop in the number of Economics and Commerce students to allow for the faculties who do not use the labs. Music do not use the labs for formal classes. No data available on whether their students use the access facilities.

AARNet connectivity and usage costs are not included in the costs of running the labs.

CS 18 Evaluation of Divisional services.

An activity that cuts across both IT and Library, and at the Divisional level, includes a proportion of non-library and non-IT related activity. The number of 'events' – defined as forums, surveys, suggestions received, feedback received, in 1999 was 610 at the Divisional level, which will obviously include some non-IT and non-library activity.

IT INFRASTRUCTURE

IT 1 Providing user support for presentation facilities.

This includes troubleshooting difficulties with the video-conferencing equipment. Call/support data and weightings applied to the activity data to reflect time taken on different type of calls were:

% of calls	Resolution	Weighting applied in model
25%	Telephone resolution	1
70%	Local (on-site) resolution	3
5%	Remote resolution (i.e. CBD campus)	10

A total of 469 calls were registered in the peak term period March-October. Minimal calls are received outside this period.

IT 2 Maintaining presentation facilities.

PPE supplied data that 130 venues were on the central booking system (Syllabus Plus) being 27 lecture theatres and 103 classroom spaces. This did not tally with the number estimated by Educational Technology Services (35 lecture theatres and 295 classrooms). The PEE data was used in the model.

IT 3 Developing presentation facilities.

This included full re-development of existing facilities, as well as partial upgrades or fitouts.=

IT 4 Maintaining specialised electronic equipment

Includes 224 units of equipment – 20 wands, 13 microfilm/fiche readers and printers, 80 copycard units, 5 self loan units, 6 devices for student card system.

IT 5 Creating and maintaining user accounts

Total accounts identified in the activity data were 21842, assuming one each per student and staff member. No differentiation was assumed for different system types. Program staff indicated that academic staff and post-graduate student accounts were more complex to administer and establish, but no weightings were applied to the cost driver data to reflect this.

IT 6 Managing central computer infrastructure operations

Same assumptions as applied to IT 5.

IT 7 Maintaining central computing infrastructure

Systems were weighted for maintenance complexity, to reflect the available skills and expertise within the Program with each system type – Solaris, NetWare, Windows NT and VMS. Different institutions or future studies at Newcastle might identify different skills and expertise requiring adjustment to these weightings.

No allowance has been made within the level of effort apportionments for special incidents, such as power outages, spikes, thunder storms, water damage etc.

IT 8 Developing central computing infrastructure

Assumes that all divisions and faculties benefit equally from central computing infrastructure.

IT 9 Maintaining computer labs

IT Program staff identified a slightly higher level of maintenance support required for Mac labs by comparison to PC labs. IT was not identified whether this was due to complexity of the equipment, or familiarity and experience on the part of the staff. Due to the small number of Macs in labs and lack of any foreseeable advantage, the weighting was not applied. Total PCs in labs, 404, total Macs 49. Proportion of Macs = 11%.

IT 10 Developing computer labs

Same assumptions as per IT activity 9

IT 11 Installing and maintaining telephone connections

A total of 381 new connections were made in the period April 1998 to March 1999, and this data was used as the basis for the driver data in the model.

IT 12 Providing telephone directory services.

Assumes that all faculties and divisions use the telephone system on an even basis. It was estimated by telephone system operators that on average 700 calls per day were received, with an additional 400 peaking in February and November, attributable it was presumed to SASD. No statistics on outgoing calls were available or estimable. The Project Team took the view that these assumptions were too broad and in the absence of any firm or alternative data on calls, the cost of this activity was to be apportioned on the basis of the number of telephone connections.

IT 13 Managing telephone system operations.

Assumes that all faculties and divisions use the telephone system on an even basis. See notes to IT activity 12.

IT 14 Maintaining telephone systems.

Assumes that maintenance is directly proportional to the number of connections. See notes to IT activity 12.

IT 15 Developing telephone systems.

Only 2 major projects during the year, but these were weighted for complexity.

IT 16 Installing and maintaining data network connections.

Faculty of Engineering does its own connections, and was therefore omitted from the driver data used for this activity. Apportionment was on the basis of number of connections across divisions and faculties on FTE. No data was available on actual requests by faculty or division. The proportion of moves and changes to new connections was assumed to be 1:2. Total new connections and changes was 1513.

IT 17 Managing data network operations.

Engineering was included in this activity, as it benefits equally from the management, maintenance and development of the overall data network (IT activities 17, 18 and 19).

IT 18 Maintaining the data network.

Engineering was included in this activity, as it benefits equally from the management, maintenance and development of the overall data network (IT activities 17, 18 and 19).

IT 19 Developing the data network

Engineering was included in this activity, as it benefits equally from the management, maintenance and development of the overall data network (IT activities 17, 18 and 19).

IT 20 Providing access to IT facilities

Nil assumptions.

WEB TEAM

WT 1 Developing Web based applications for the University.

The number of weighted applications (developed and in maintenance) was the cost driver for this activity. Faculties and Divisions requesting the system or managing the business process supported by the system were the cost objects. EG SASD was the cost object for the exam results system. The system categorisations and weightings were as follows:

Complexity

Level 1 – Basic system – often read only applications

Level 2 – More sophisticated, often with authentication and read/write

Activity Based Costing

Level 3 – Complex – fully featured, significant database complexity and interactions (E.g. with other databases, a range of web protocols)

Weightings

Level 1 = 1

Level 2 = 6

Level 3 = 10

Weightings were based on estimates of the relative time taken for each type of application - although there will always be variations within various level 1, 2 and 3 applications.

WT 2 Developing and Maintaining Web Sites

The number of (weighted) web pages was the cost driver for this activity, and the cost objects were the faculties and divisions receiving the service. It should be noted that this distribution is at a point in time and will be different in any given year, depending upon the projects undertaken. The weighting system was one for standard pages and 2 for more complex pages. The latter are determined by the technical issues (e.g. JavaScript, forms, DHTML) and the nature of the client. External or cost-recovery clients are more complex (time consuming) due to the need for additional project management, contract formulation, invoicing etc.

WT 3 Providing leadership, coordination and support for University Web sites.

The number of web authors was used as the driver of support activity. The cost objects were the faculties and divisions with authors using the central web server. Activity was apportioned between them on a pro-rata basis. While this driver reflects direct support demands it does not directly relate to the general leadership or support that exists because we have a web site, the level of which is not greatly affected by the number of authors. E.g. the policy formulation and administration. Also, the faculties that do not use the central service are not included in the share of the costs and the support received for user registration bears little relationship to the number of authors. However, there did not appear to be a better measure for the current exercise, and the FTE involved is not high enough to justify a further 'breakdown' of activities.

INFORMATION SYSTEMS

The activity definition in the Activity Dictionary (Appendix C) may provide some clarification of assumptions underlying these activities.

IS 1 Participate in evaluation and implementation of packaged software solutions

IS 2 Maintain and support packaged corporate systems

IS 3 Analyse, design and develop in-house corporate information systems

IS 4 Maintain and support in-house corporate information systems

IS 5 Monitor and capacity plan all corporate information databases

This activity was deleted from the model during the study, and the activities subsumed within other IS activities.

IS 6 Evaluate and implement ad hoc reporting tools for desktops

IS 7 Monitor and plan for growth of all corporate information systems

Appendix F: Model Assumptions—Allocation of Central Overhead Costs

In meetings with the Director of the Financial Services Unit, Ms Christina Murdoch, central fund costs were readily identified within the Annual Accounts for 1999, and could be extracted and apportioned against IESD IT and Library activities, using level of effort or space utilisation as the drivers.

Space Utilisation

Space utilisation data provided by PPE in the Division of Finance and Property, provided the basis for distribution of many of the building-related overhead costs. IESD IT and library space utilisation was calculated using PPE's "Buildings Centrally Maintained" Institutional Building File Summary Report GFA square metres. The total GFA square metres of buildings centrally maintained is 184,228 sq m (Institutional Building File Summary Report). Allocation back against the IT and Library activities of the Division was based upon assumptions regarding total space utilisation. These were:

- CT Building space – IESD occupancy assumed to be 100% against IT activities
- Network rooms across campus – IESD occupancy assumed to be 100% against IT activities
- McMullin Building – IESD occupancy assumed to be 100% against IT activities
- Hunter Building – IESD occupancy assumed to be 100% against Library activity
- Auchmuty – IESD occupancy assumed to be 70% library, and 30% IT related

The space utilisation resource driver within the Model is identified as SQM.

Full Time Equivalent staff numbers (FTE)

Total University staff FTE was calculated with reference to the Internal Research Unit's 1999 DETYA Statistical Return provided by the Institutional Research Unit (IRU), which provided totals by Faculty and non-academic activities. Unfortunately, the DETYA data does not identify non-faculty staff according to internal operating divisions, grouping instead by broad categories for sector-wide analysis. As a result, the Project Team utilised data from the Human Resources Branch for staff FTE in non-academic divisions as at 31 December 1999, as the basis for calculating FTE in each of the non-academic divisions. DETYA data was used for Faculty FTE.

There was a slight variation in the totals for non-academic divisions between the HR Branch data and DETYA returns, owing to the different data collection period.

Within the Model, the staff numbers are expressed as FTE.

Power, lighting and heating

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon SQM. The 1999 Central Fund Actual for this was \$xx, excluding Central Coast Campus. Repairs and Maintenance costs is proportionately allocated by the Buildings Centrally Maintained Institutional Building File Summary Report GFA sq m. (184,228 SQM)

Water and Sewage

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon SQM. The 1999 Central Fund Actual for this was \$xx, excluding Central Coast Campus. Repairs and

Maintenance costs is proportionately allocated by the Buildings Centrally Maintained Institutional Building File Summary Report GFA sq m. (184,228 SQM)

Depreciation on buildings

Finance Department provided the 1999 Schedule of Depreciation prepared for the 1999 Annual Accounts. Apportionment of this back to IT and library activities was based upon

Depreciation on book collection

Finance Department provided the 1999 Schedule of Depreciation prepared for the 1999 Annual Accounts. Apportionment was based upon the total value of all collections at Callaghan. Depreciation for book collection at the Central Coast Campus was excluded from the study (this represented approximately 5% of the total depreciation on the collection).

Depreciation on capitalised equipment

Finance Department provided the 1999 Schedule of Depreciation prepared for the 1999 Annual Accounts. Certain items of capital equipment depreciation were identifiable by activity, and these amounts were directly assigned to activities based upon the schedule information. Apportionment of all other capitalised equipment depreciation was done on the basis of FTE level of effort per activity.

Repairs and Maintenance

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon SQM. The 1999 Central Fund Actual for this was \$xx, excluding Central Coast Campus. Repairs and Maintenance costs is proportionately allocated by the Buildings Centrally Maintained Institutional Building File Summary Report GFA sq m. (184,228 SQM)

Cleaning

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon SQM. The 1999 Central Fund Actual was \$xx, excluding Central Coast Campus. Cleaning costs is proportionally allocated by the Buildings Cleaned Centrally Institutional Building File Summary Report GFA sq m. (163,833 SQM)

Insurance

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon SQM. The 1999 Central Fund Actual was \$xx, excluding Central Coast Campus. Insurance costs is proportionally allocated by the Buildings Maintained Centrally Institutional Building File Summary Report GFA sq m. (184,228 SQM).

Insurance on capitalised equipment was separated from general and buildings insurance, and where individual items were identifiable, has been allocated directly against the activity. In other instances, allocation has been across activities using FTE. Finance advised that key insured items were the book and other collections (\$xx) and computer hardware (\$xx).

Payroll and HR costs

These costs, being activities within the Student and Academic Services Division of the University, were not separated out and apportioned to the IT and Library activities. A separate exercise would be necessary to identify the true costs of these activities within the SAS Division for apportionment across the University, presumably based on FTE.

AARNet costs

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon FTE, as a proportion of total University staff by FTE. Student connectivity and usage charges were not included in the model as these are outside of IESD activity and not costs that the Division can control.

Postage

The Mail Office conducted a survey of postage costs during 1999 in a separate project. Data collected by the mail office for postage within the Division was grouped into three areas, based upon the antecedent units of the Division – the Library, IT Division and CALT. Postage costs for IT and Library activities were therefore easily extracted from this survey data. Considerable postage costs within the Information Resources Program in support of Inter Library Loans enabled direct apportionment of some postage costs against this activity, with the balance being apportioned across remaining activities on the basis of FTE per activity.

The Mail Office study identified postage costs of \$xx for Library activity in 1999, and \$xx for IT-related activity. The IT trainers were resident in the CT Building for much of 1999 and costs for their postage have therefore been assumed to be within this total. A small sum was transferred from the library total to IT to allow for IT staff located within the Auchmuty Library (\$xx).

Distribution of postage within Information Resources was as per the following, based upon information provided by the Program:

Activity 1	(Receiving and paying for resources)	\$xx
Activity 8.1	(Providing ILL – Incoming)	\$xx
Activity 8.2	(Providing ILL – Outgoing)	\$xx
Activity 11, 12 & 13		\$xx each activity

(The last three are respectively: Ordering, Receiving & Paying, and Accessioning and End Processing information resources).

Minor Buildings Work

This work is funded on the basis of annual bids from all areas of the University, and is therefore undertaken on the basis of an assessment of needs. The cost against any individual activity or area is therefore completely variable in any year, and any direct or implied costs within this category for 1999 have therefore been omitted from the Model.

Staff Development

Finance Department provided University totals for this category as prepared for the 1999 Annual Accounts. Apportionment across library and IT activities was based upon FTE. The 1999 Central Fund Actual for this was \$xx, excluding Central Coast Campus. Staff

Activity Based Costing

Development costs is proportionately allocated by the FTE at the activity level. Total cost of \$xx for IT and Library.

Vice-Chancellor's Office and other central executive functions

No costs associated with the central functions of the University supported through the Vice-Chancellor's Office or similar central administrative unit, were apportioned against the Library or IT activities in this study.