



PLANNING AND DEVELOPMENT DEPARTMENT

**OUTLINE FUNCTIONAL SPECIFICATION
FOR A BUSINESS OBJECTS DASHBOARD TOOL**

MAY 2011

TABLE OF CONTENTS

1. INTRODUCTION.....	3
1.1 BACKGROUND	3
1.2 PURPOSE.....	4
1.3 RESPONSE FORMAT.....	5
2. MANAGEMENT INFORMATION PROVISION.....	6
3. THE TECHNICAL ENVIRONMENT	7
3.1 DATABASE SYSTEMS.....	7
3.2 APPLICATION AND WEB SERVERS.....	7
3.3 CLIENT SYSTEMS.....	7
3.4 REPORTING.....	7
3.5 LICENCES	8
4. FUNCTIONAL REQUIREMENTS	9
4.1 DATA AND STRUCTURE RELATED REQUIREMENTS	9
4.2 MI TOOLS	9
4.3 TRAINING AND CONTRACTUAL REQUIREMENTS.....	10
5. APPLICATION AREAS.....	11
5.1 SCOPE AND PRIORITISATION.....	11
5.2 RESEARCH & KNOWLEDGE EXCHANGE	11
5.3 STUDENTS	11
5.3 PERSONNEL AND PAYROLL.....	12
5.4 FINANCE	12
APPENDIX A RELEVANT STATISTICS	13
APPENDIX B SUPPLIER RESPONSE TO FUNCTIONAL REQUIREMENTS	14
APPENDIX C SUPPLIER RESPONSE TO EXAMPLES OF REQUIRED	
IMPROVEMENTS IN MI PROVISION	24

1. INTRODUCTION

1.1 Background

The University of Liverpool is acquiring software products and tools to improve the quality and availability of management information in order to support the development of performance measurement processes and inform decision making. These tools will include the SAP Business Objects data warehouse tool “Data Integrator” (which has recently been acquired) and a Business Objects Dashboard tool which is the subject of this Outline Functional Specification. Implementation of these tools will be expected to provide a range of benefits including:

- timely provision of appropriate information to key individuals at all levels of the University to support strategic planning and operational management
- provision of appropriate tools for managers to support devolution of responsibility, e.g. financial planning and budget monitoring, with the flexibility to allow for users having a wide range of skills and abilities and to operate on multiple platforms
- improved capability for evidence-based decision making
- standardised data definitions and standards to support accurate and reliable reporting for internal and external purposes, including returns to statutory bodies
- creation of single agreed sources of data and improved data collection efficiency
- enhanced capability for data analysis, assessment and interpretation

The University has the following corporate information systems:

- Banner: Student Information System (known locally as “Spider”)
- Agresso: Financial System (5.5)
- Alta-HR: HR and Payroll System
- Planon: Facilities Management Information System.
- Scientia: Academic Timetabling and Room Booking System (known locally as “ORBIT”)
- IRIS (“Integrated Research Information System”): A bespoke Research Management System containing a wide range of research related data for staff and their grants
- ePrints: Institutional repository
- Other sources of structured data held in both internal and external databases and spreadsheets

The above systems operate on an Oracle platform and provide a reporting facility through Business Objects using both the operational data and some specialist data marts. At present, management information is obtained from these systems in a variety of ways, e.g.:

- Standard and ad hoc reports generated and promulgated by the system owners
- Business Objects reports run by or on behalf of end users
- Standard and ad hoc reports generated on behalf of end users by the University’s Planning and Development Department, primarily to

support performance measurement and monitor progress against the University's Strategic and Operational Plans

Significant use is made at local level of spreadsheets and databases to extract and merge data from the corporate information systems and manipulate it to meet local information requirements. It is recognised that this raises issues in terms of data accuracy and consistency. When the new software products and tools are available, this practice will be discouraged.

The University has recently undergone a comprehensive organisational restructuring. This has resulted in management, planning and financial responsibility and accountability being devolved to three academic Faculties, each having subordinate reporting layers of Schools and Departments and a Professional Services function which collectively comprises the University's administration and support departments. This organisational change, coupled with recent developments affecting the funding of the Higher Education sector, has placed a strong focus on the need for robust, comprehensive and accessible management information.

A University-wide consultation exercise has been undertaken to understand the requirements for management information and the problems and shortcomings of the present arrangements. The findings from this exercise have identified that the following areas are likely priority targets for improved management information provision:

- Research and Knowledge Exchange activities
- Student data
- Personnel and Payroll
- Finance
- Information to support the measurement and reporting of the achievement of Key Performance Indicators allied to the Key Ambitions in the University's Strategic Plan.

The findings from consultation also indicate that a number of management information and data-related issues will need to be addressed either prior to or in conjunction with the implementation of the new software tools. These include:

- The need for standardised data definitions
- Shortage of expertise in the use of data access and reporting tools
- Data quality issues (both actual and perceived)
- Lack of awareness of management information currently available
- A desire to be self-sufficient rather than reliant on others for the provision of management information

1.2 Purpose

The purpose of this Outline Functional Specification is to set out, the University's requirements for a Business Dashboard tool, as determined in consultation with users and providers of management information across the University, as well as technical specialists and those with specific responsibility for the University's information systems.

It should be noted that this Outline Functional Specification is not intended to be a definitive or exhaustive list of requirements. It is intended to identify key attributes as well as setting out certain functions and features which the University has identified as essential to meeting its vision for the provision of management information.

Examples of the types of management information provision and issues that the University wishes to address in each application area are set out in section 5.

The schematic diagrams in section 2 provide a before-and-after view of management information provision in the University.
Relevant statistics are provided in Appendix A.

1.3 Response format

To facilitate suppliers' responses, the University's requirements are set out in tabular form in Appendix B, under the following sub-headings:

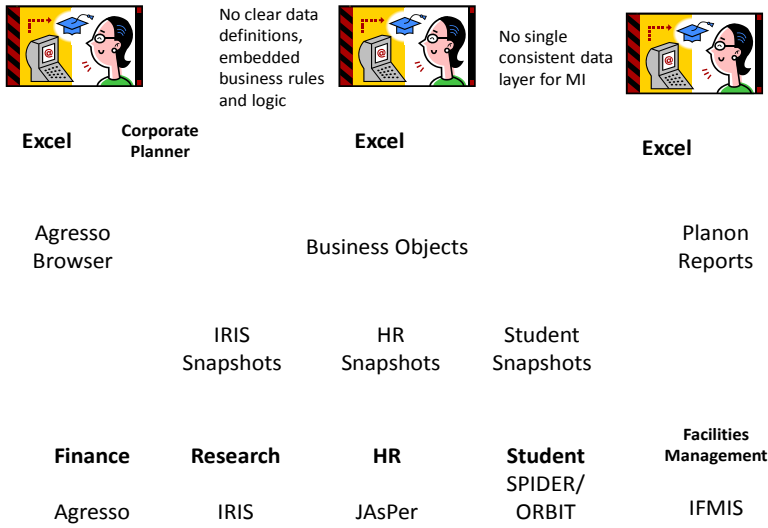
- General Requirements
- The Technical Environment
- Functional Requirements:
 - Data-related requirements
 - MI tools
 - Training and contractual requirements

This appendix is intended to serve as a Word template in which suppliers will record, against each item, the extent to which the requirement will be met as well as details of how this will be achieved, supported by examples where appropriate.

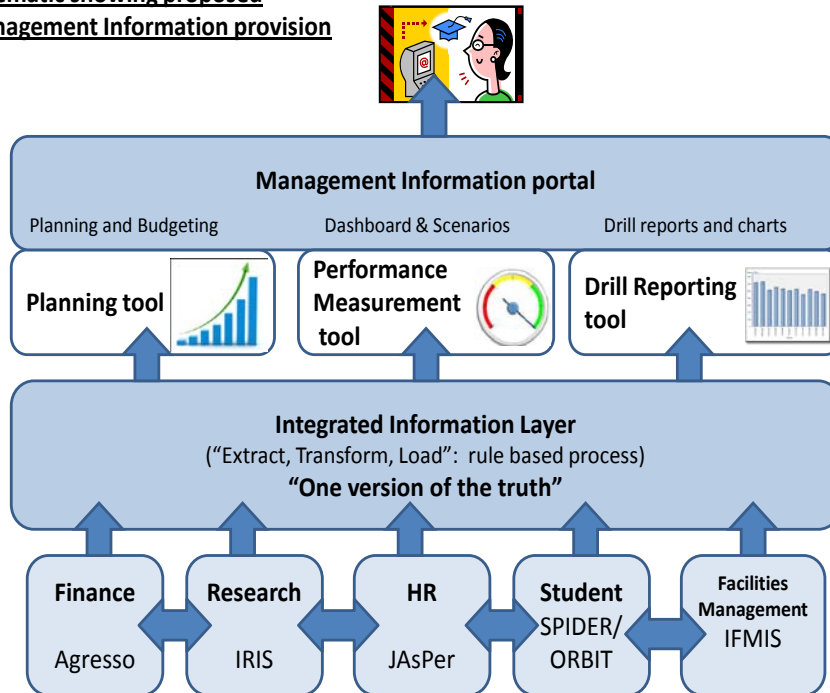
The examples of management information provision and issues within each of the main application areas appear in tabular form in Appendix C. This is also intended to serve as a Word template in which suppliers are requested to state how their proposed solution will address the issues, with examples.

2. MANAGEMENT INFORMATION PROVISION

Schematic showing current Management Information provision



Schematic showing proposed Management Information provision



3. THE TECHNICAL ENVIRONMENT

The Business Objects Dashboard tool will need to operate within the University of Liverpool's corporate computing infrastructure.

3.1 Database systems

The University currently runs Oracle 11g on Sun Solaris database servers and storage area networks. Solaris containers are used to provide virtualisation facilities which in turn provide business continuity facilities. This is the University's preferred database environment. The University also operates a number of systems which use Microsoft SQL Server databases. Where SQL server is used the University requires a dynamic interface to Oracle databases to be available. The University is acquiring the SAP Business Objects "Data Integrator" tool to underpin the development of a robust data warehouse and perform the extraction, transformation and loading of data into the reporting mechanism. Implementation of Data Integrator is planned to begin in June 2011.

3.2 Application and web servers

Where an application requires an application server (to process client requests) or a web server to support a client web based interface, these systems must run on either Solaris (on Sun systems) or on Windows Server 2003 (or later) (on X86 systems). Apache and IIS web servers are used within the present infrastructure. All new software is expected to be able to run in a virtual environment and server requirements should be based on this presumption.

3.3 Client systems

All applications are required to provide a web interface for client usage, supported with IE8 browsers on PC platforms, Safari on Macintosh systems, and by Firefox on PCs, Macs and Linux systems.

Where a "full client" is used, this is required to operate under Windows 7. The full client should also operate and be supported under Windows Terminal Server and Citrix.

Access to some of the corporate databases is available to all University staff, and a number of packages comprise the University's business information systems, including those listed in para 1.1.

Support for mobile devices is required.

3.4 Reporting

The primary strategic product for all reporting is currently Business Objects and a migration from Version 5 to BOXI Release 2 is nearing completion and this will be followed by Release 3 by the end of June 2011. In addition some application systems have their own integrated reporting tools, e.g. Agresso browsers and Planon reports. End user reports are also currently accessed from an in-house developed portal that allows secure management of and access to a number of different information systems, with emphasis on teaching and research-related data.

3.5 Licences

The University requires 300 user licences, or a server licence, whichever is more economically advantageous, estimated to be sufficient for three years from initial implementation.

4. FUNCTIONAL REQUIREMENTS

4.1 Data and structure related requirements

- Scalable enterprise system, able to draw in unstructured data. Numbers of concurrent users should be limited only by the size and configuration of the server and not by any limitation of the software, except where stated as part of the licensing agreement.
- Able to cope with changes to source systems, data structures or organisational restructuring without unduly impacting the University's ability to undertake analysis that draws upon historical data, e.g. trend analysis. Full impact analyses of such changes upon Business Objects and all reports is required.
- Able to accommodate basic data changes, e.g. changes in names of schools or additional schools, without manual intervention, as well as changes to reports or structures.
- Able to draw data from all relevant corporate systems, both singly and in combination. Also able to draw data from other internal and external sources including spreadsheets and other databases and to combine data from these sources with data from corporate systems.

4.2 MI Tools

1. Able to present and display data in a variety of user-definable ways including graphs, charts and tables. Must allow data to be presented at various levels and provide the facility to "drill down" from the highest to the lowest level as well as the ability to slice and dice data.
2. Capable of undertaking trend analysis, KPI reporting, data modelling and comparison of performance against targets.
3. Capable of undertaking "what if" scenario planning
4. Accessible when required, including the ability to use designated reports off line
5. Provision of a portal or embedded portal to support personalisation, i.e. the display of data and information relevant to an individual staff member in their role within the University.
6. Intuitive to use and requiring a minimum of special skills and training at end user level.
7. Must have access controls which limit access to features, reports, data 'slices', etc., via rule based criteria (i.e. row level security), e.g. limiting individual school access to named individuals nominated by the head of school.

8. Inclusion of controls that prevent users from corrupting base data and reports or obtaining unauthorised access or distribution of reports.
9. Ability to preview reports prior to release.
10. Ability to embed reports within Microsoft Office documents for presentations and publications material. Optionally this may or may not need to be refreshed dynamically from the document.
11. Able to deliver specified reports on mobile devices in a 'device friendly' format.
12. Ability to refresh report data automatically or on request by authorised users.

4.3 Training and contractual requirements

13. Training. Three levels of training are required:

- Technical training for Computing Services staff
- End user training for occasional MI users
- End user training for MI professionals

A "train the trainer" approach is favoured, although other training models will be considered

14. Fully project managed implementation support and consultancy, e.g. to assist the University to identify and address data issues prior to and during implementation, and/or provide HE-specific template models and solutions.
15. Ongoing support and maintenance, including new releases and upgrades.
16. A comprehensive maintenance contract clearly identifying what is included and what would be available at extra cost, e.g. upgrades and new features and remote application of upgrades.

5. APPLICATION AREAS

5.1 Scope and prioritisation

The University intends to utilise the software products and tools to support the provision of management information of all kinds to managerial, administrative, academic and technical staff throughout the organisation, without limitation. Implementation will be on an incremental basis one application area at a time. The majority of the University's management information needs are expected to fall within one of the following application areas:

- Research
- Students
- Personnel and Payroll
- Finance

It is currently anticipated that Research will be the first application area to be implemented, initially on a pilot basis within one of the University's three Faculties. The programme to extend the use of the new technology to other application areas and other Faculties will be informed by the outcome of the pilot.

The following are brief examples of the types of improvement in management information provision that we expect the technical solution to bring about in each of the four application areas.

5.2 Research & Knowledge Exchange

The University regularly bids for research grants from a variety of external organisations. Basic data is available to calculate the cost of the bid and the costs that the University would incur in undertaking the research. The amount of funding that would be made available and the payment profile are also known before a bid is submitted. However, this data is not captured and reported in a way that allows the University to determine if some research opportunities would not be cost-effective and should therefore not be pursued.

There is currently no facility to monitor the quality of research outcomes, nor the amount of time spent on research bids that are not submitted or that fail. The availability of this information would provide valuable lessons to shape the University's research strategy.

5.3 Students

The mix of students between the various courses of study that the University offers is an important determinant in the level of funding received from the Higher Education Funding Council. However, the University currently does not have the ability to undertake budgetary planning and modelling in order to quantify the effects of changes in the student mix.

The facility currently does not exist to monitor the full student lifecycle and undertake a detailed progression analysis from the time of application through to employment and alumni relations.

5.3 Personnel and Payroll

Workforce profiling requires data links between the Agresso Finance system and the Alta HR and Payroll system. Although links are in place and basic information is available, this is not at a level that will easily support decision-making regarding the future size and composition of the University's workforce, nor is there a facility to model different scenarios.

There is a recognised need to consolidate all staff-related data in a single database and to allow a user-definable filtering capability.

5.4 Finance

There is a need for income and expenditure modelling by Faculty and School including scenario planning, e.g. to model the effects on income and expenditure of introducing a new course of study.

There is currently no facility to model the cost base of teaching, e.g. to determine the effect on the cost base of a certain number of new students being admitted to a particular course.

APPENDIX A

RELEVANT STATISTICS

The following is a selection of University statistics to assist with defining the scale of the overall requirement:

Faculties: 3

Departments: 55

Programmes: 454

Student Body:

- Total: 19,330
- Full time: 15,918
- Part time: 3,412

- Undergraduate: 14,426
- Post Grad Research: 1,475
- Post Grad Taught: 1,540
- Continuing Education: 1,889

Staff:

- Total: 5,021
- Academic: 2,238
- Professional Services: 2,783

Further information can be obtained from the University's most recent Annual Report, which can be found at <http://www.liv.ac.uk/annual-report/annual-report-2009.pdf>

APPENDIX B

SUPPLIER RESPONSE TO FUNCTIONAL REQUIREMENTS

SUPPLIER.....

B1: General requirements

Ref No.	Requirement	Brief description of how the proposed solution will meet the requirement
G1	Timely provision of appropriate information to key individuals at all levels of the University to support strategic planning and operational management.	
G2	Provision of appropriate tools for managers to support devolution of responsibility, e.g. financial planning and budget monitoring, with the flexibility to allow for users having a wide range of skills and abilities and to operate on multiple platforms.	
G3	Improved capability for evidence-based decision making.	
G4	Standardised data definitions and standards to support accurate and reliable reporting for internal and external purposes, including returns to statutory bodies.	
G5	Creation of single agreed sources of data and improved data collection efficiency.	
G6	Enhanced capability for data analysis, assessment and interpretation.	

Ref No.	Requirement	Brief description of how the proposed solution will meet the requirement
G7	Ability to interface with existing corporate information systems: <ul style="list-style-type: none"> • Banner Student Information System • Agresso 5.5 Financial System • Alta HR and Payroll System • Planon Facilities Management Information System • Scientia Academic Timetabling and Room Booking System 	

B2: The Technical Environment

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
TECH1	<p>Database systems</p> <p>The University currently runs Oracle 11g on Sun Solaris database servers and storage area networks. Solaris containers are used to provide virtualisation facilities which in turn provide business continuity facilities. This is the University's preferred database environment. The University also operates a number of systems which use Microsoft SQL Server databases. Where SQL server is used the University requires a dynamic interface to Oracle databases to be available. The University is acquiring the SAP Business Objects "Data Integrator" tool to underpin the development of a robust data warehouse and perform the extraction, transformation and loading of data into the reporting mechanism. Implementation of Data Integrator is planned to begin in June 2011.</p>		
TECH2	<p>Application and web servers</p> <p>Where an application requires an application server (to process client requests) or a web server to support a client web based interface, these systems must run on either Solaris (on Sun systems) or on Windows Server 2003 (or later) (on X86 systems). Apache and IIS web servers are used within the present infrastructure. All new software is expected to be able to run in a virtual environment and server requirements should be based on this presumption.</p>		

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
TECH3	<p>Client systems All applications are required to provide a web interface for client usage, supported with IE8 browsers on PC platforms, Safari on Macintosh systems, and by Firefox on PCs, Macs and Linux systems. Where a “full client” is used, this is required to operate under Windows 7. The full client should also operate and be supported under Windows Terminal Server and Citrix.</p> <p>Access to some of the corporate databases is available to all University staff, and a number of packages comprise the University’s business information systems, including those listed in para 1.1.</p> <p>Support for mobile devices is required.</p>		
TECH4	<p>Reporting The primary strategic product for all reporting is currently Business Objects and a migration from Version 5 to BOXI Release 2 is nearing completion and this will be followed by Release 3 by the end of June 2011. In addition some application systems have their own integrated reporting tools, e.g. Agresso browsers and Planon reports. End user reports are also currently accessed from an in-house developed portal that allows secure management of and access to a number of different information systems, with emphasis on teaching and research-related data.</p>		

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
TECH5	<p>Licences</p> <p>The University requires 300 user licences, or a server licence whichever is more economically advantageous, estimated to be sufficient for three years from initial implementation.</p>		

RESPONSE TO THE UNIVERSITY OF LIVERPOOL'S FUNCTIONAL SPECIFICATION FOR A MANAGEMENT INFORMATION SYSTEM

SUPPLIER.....

B3: Functional requirements

B3.1 Data-related requirements

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
DATA 1	Scalable enterprise system, able to draw in unstructured data. Numbers of concurrent users should be limited only by the size and configuration of the server and not by any limitation of the software, except where stated as part of the licensing agreement.		
DATA 2	Able to cope with changes to source systems, data structures or organisational restructuring without unduly impacting the University's ability to undertake analysis that draws upon historical data, e.g. trend analysis. Full impact analyses of such changes upon Business Objects and all reports is required.		
DATA 3	Able to accommodate basic data changes, e.g. changes in names of schools or additional schools, without manual intervention, as well as changes to reports or structures.		

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
DATA 4	Able to draw data from all relevant corporate systems, both singly and in combination. Also able to draw data from other internal and external sources including spreadsheets and other databases and to combine data from these sources with data from corporate systems.		

B3.2 MI Tools

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
MI 1	Able to present and display data in a variety of user-definable ways including graphs, charts and tables. Must allow data to be presented at various levels and provide the facility to “drill down” from the highest to the lowest level as well as the ability to slice and dice data.		
MI 2	Capable of undertaking trend analysis, KPI reporting, data modelling and comparison of performance against targets.		
MI 3	Capable of undertaking “what if” scenario planning.		
MI 4	Accessible when required, including the ability to use designated reports off line.		
MI 5	Provision of a portal or embedded portal to support personalisation, i.e. the display of data and information relevant to an individual staff member in their role within the University.		
MI 6	Intuitive to use and requiring a minimum of special skills and training at end user level.		
MI 7	Must have access controls which limit access to features, reports, data ‘slices’, etc., via rule based criteria (i.e. row level security), e.g. limiting individual school access to named individuals nominated by the head of school.		
MI 8	Inclusion of controls that prevent users from corrupting base data and reports or obtaining unauthorised access to the system or distribution of reports.		

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
MI 9	Ability to preview reports prior to release.		
MI 10	Ability to embed reports within Microsoft Office documents for presentations and publications material. Optionally this may or may not need to be refreshed dynamically from the document.		
MI 11	Able to deliver specified reports on mobile devices in a 'device friendly' format.		
MI 12	Ability to refresh report data automatically or on request by authorised users.		

B3.3 Training and contractual requirements

Ref No.	Requirement	Compliant? (yes/no/partially)	Details and examples
TC 1	<p>Training. Three levels of training are required:</p> <ul style="list-style-type: none"> • Technical training for Computing Services staff • End user training for occasional MI users • End user training for MI professionals <p>A “train the trainer” approach is favoured, although other training models will be considered.</p>		
TC 2	Fully project managed implementation support and consultancy, e.g. to assist the University to identify and address data issues prior to and during implementation, and/or provide HE-specific template models and solutions.		
TC 3	Ongoing support and maintenance, including new releases and upgrades.		
TC 4	A comprehensive maintenance contract clearly identifying what is included and what would be available at extra cost, e.g. upgrades and new features and remote application of upgrades.		

APPENDIX C

SUPPLIER RESPONSE TO EXAMPLES OF REQUIRED IMPROVEMENTS IN MI PROVISION

Ref No.	Example	Brief description of how the proposed solution will meet the requirement
RESEARCH & KNOWLEDGE EXCHANGE		
R1	The University regularly bids for research grants from a variety of external organisations. Basic data is available to calculate the cost of the bid and the costs that the University would incur in undertaking the research. The amount of funding that would be made available and the payment profile are also known before a bid is submitted. However, this data is not captured and reported in a way that allows the University to determine if some research opportunities would not be cost-effective and should therefore not be pursued.	
R2	There is currently no facility to monitor the quality of research outcomes, nor the amount of time spent on research bids that are not submitted or that fail. The availability of this information would provide valuable lessons to shape the University's research strategy.	
STUDENTS		
S1	The mix of students between the various courses of study that the University offers is an important determinant in the level of funding received from the Higher Education Funding Council. However, the University currently does not have the ability to undertake budgetary planning and modelling in order to quantify the effects of changes in the student mix.	

Ref No.	Example	Brief description of how the proposed solution will meet the requirement
S2	The facility currently does not exist to undertake a detailed progression analysis of students from the time of application, through their progress in the University to their degree success and their subsequent employability.	
PERSONNEL AND PAYROLL		
P1	Workforce profiling requires data links between the Agresso Finance system and the Alta HR and Payroll system. Although links are in place and basic information is available, this is not at a level that will easily support decision-making regarding the future size and composition of the University's workforce, nor is there a facility to model different scenarios.	
P2	There is a recognised need to consolidate all staff-related data in a single database and to allow a user-definable filtering capability.	
FINANCE		
F1	There is a need for income and expenditure modelling by Faculty and School including scenario planning, e.g. to model the effects on income and expenditure of introducing a new course of study.	
F2	There is currently no facility to model the cost base of teaching, e.g. to determine the effect on the cost base of a certain number of new students being admitted to a particular course.	

