



Business Analysis

'To-Be' Stage

Business Process Document

Student Timetabling Project

Document Version: 0.1

Date: 30 June 2010

Learning and Information Services



1. Document History

Key Personnel

	Name/Position
Author	Karen Cresham
Owner	

Version History

Version	Date	Summary of Changes	Changes Marked

Distribution for review

Name	Area
M Ahern	Director, LIS
C Anderson	Acting Head, School of Psychology
J Anthony	Head of Development and Business Enhancement, LIS
P Baugh	Associate Director, Lancashire Business School
L Bradley	Education Officer, Students Union
C Hickson	Head of Business and Technical Support, LIS
I McMillan	Director, SASS
P Morris	Director, Facilities Management
A Worsley	Head of School of Social Work
DW Turner	Senior Business Analyst, LIS

Distribution for information

Name	Area
Mike Blackmon	School of Social Work
Ian Carrie	Learning and Information Services
Barry McCarthy	School of Psychology
Helen Ellis	School of Nursing and Caring Services
Anne Kelly	Room Booking Unit
Francine le Saint	Lancashire Business School
Linda Sanderson	School of Nursing and Caring Services
David Wilding	Room Booking Unit

Definition of Terms

Banner	Student Record System
CAPP	Curriculum Activity Programme Planning
CMIS	Central Management Information System
JISC	Joint Information Systems Committee
SAM	Student Attendance and Monitoring System
SUMS	Southern Universities Management Services
Trent	Human Resource and Payroll Database



2. Contents

1. Document History	2
Key Personnel	2
Version History	2
Distribution for review	2
Distribution for information	2
Definition of Terms	2
2. Contents	3
3. Purpose of Document	4
4. Background	4
5. Scope and Exclusions	4
6. Constraints and Assumptions	5
7. Redesign Proposal(s)	6
Process Re-design	6
Time line Re-design	6
Resource Requirements	8
Home Room Allocations	9
Banner Recommendations	9
8. Implementation approach	10
Pilot Build	10
Resource Requirements	10
System Interfaces	10
Performance Metrics	11
9. Appendix A To-Be Process Map	13
10. Appendix B To-Be Process Time line	14
11. Appendix C Home Room Allocation	15
12. Appendix D Pilot Build Timeline	16



3. Purpose of Document

This document will provide a detailed definition of the revised business process to produce an integrated timetable for University programmes delivered at Main campus, Burnley campus and Westlake campus. The revised business process will aim to address the key issues identified in the As Is process review but will not necessarily address all the issues identified. The process has been defined based upon a series of workshops with academic staff, room booking staff and principal technician, consultancy with a Senior Consultant from SERCO the product supplier and best practice from SUMS Consulting Group and JISC.

This document will include;

- business process map
- timeline for business process
- home room allocations
- timeline for pilot build and test
- systems overview diagram
- resources required for To-Be business process
- resources required for pilot build and test
- recommendations related to the use of Banner

4. Background

The project has two objectives, firstly to deliver an online timetable in a timely fashion to enable students to make work, life and study decisions and to produce a timetable that effectively manages the space on the estate.

The project aims to

- 1) Establish a university policy on timetabling and conflict resolution
- 2) Review and rework the timetabling business process to leave the definition of timetabling constraints with the schools, but centralise the administrative and scheduling activities of the process in FM using the CMIS timetabling system
- 3) Provide appropriate integration between CMIS and other systems, i.e. Banner and Trent, to minimise duplication of data entry
- 4) Establish a timetable publication mechanism so that timetables for students, lecturers, courses and rooms are available online
- 5) Create a mobile compliant app to display student and lecturer timetables
- 6) Refine the timetabling process to minimise changes to the timetable after publication, with an emphasis initially on minimising changes to event times rather than room allocations
- 7) Develop effective communication mechanisms to notify staff and students of any changes to the timetable
- 8) Measure and monitor the effects of the new timetabling process on estate utilisation and student experience.

5. Scope and Exclusions

The scope of the revised business process will include the following:

Learning and Information Services



1. The process for defining the requirements and automatically scheduling and allocating rooms for programmes operating at Main campus, Burnley campus and Westlake campus.
2. The time line for the time tabling process.
3. The data sources used in the timetabling process.
4. The key “actors” involved in the time tabling process.
5. All rooms allocated for teaching space both general and specialist rooms.
6. Indicative publishing dates time tables
7. The time line for CMIS build and configuration to build and test the pilot system
8. The data sources used in the pilot system
9. The resources required to build and test the pilot system
10. The resources required to support the new business process

The scope of the process review excluded:

1. Central exam time tabling
2. Time tabling for personal tutor access
3. Ad hoc booking of teaching rooms or specialist rooms by staff
4. Ad-hoc booking of teaching rooms or specialist rooms by students
5. Conference management and the use of the estate for external revenue
6. Building security and access
7. Process to schedule portable specialist equipment
8. Procurement of specialist equipment and consumables for laboratories
9. Staff workload model which impacts on staff availability for teaching
10. Recruitment of temporary staff which impacts on scheduling staff for teaching
11. Curriculum management, specifically programme and module validation
12. Progression and selection of optional or elective modules which impacts on student registration numbers and therefore scheduling and room allocation.

6. Constraints and Assumptions

The constraints related to the To-Be phase include the following;

1. All returning students and first year students must enrol on programmes and register on core modules for a prescribed programme and core, optional and elective modules for non-prescribed programmes to receive a personalised time table including class groups.
2. Students must have a valid, active network account to access their personalised timetable
3. Students and staff must have an active University email account to receive communications related to changes in the timetable.
4. Staff must have a valid, active network account to access their staff timetable.
5. Programme structures must be set up on Banner CAPP and extracted into Facility CMIS for scheduling.
6. Core optional and elective modules including active and pending (awaiting validation) must be set up in Banner to be extracted into Facility CMIS for scheduling
7. Programme and module constraints which affect scheduling must be captured and set up in Facility CMIS for scheduling
8. Staff constraints affecting staff availability for teaching must be captured and set up in Facility CMIS for scheduling.
9. Room constraints affecting room allocation must be captured and set up in Facility CMIS for automatic rooming of teaching events



The assumptions related to the To-Be phase include the following;

1. CMIS Version 10 will be available under XP in a project environment by the end of July to enable the pilot system build to start
2. CMIS Version 10 will operate under Windows 7 and the pilot system build will operate under Windows 7
3. All specialist rooms and equipment required for teaching at Main campus, Burnley campus and West lakes will be clearly identified and documented by the Principal Technicians by the end of July.
4. Resource will be available from Facilities Management during the pilot build and test
5. Resource will be available from SASS or Schools by start of September to capture and build programme structures in Banner CAPP for the pilot system build.
6. User training for Banner CAPP will be delivered by Banner Support team if required.
7. Resource will be available from LIS by middle August to develop the system interfaces.
8. Resource will be available from LIS to amend Banner (SAM) to accommodate the class groups imported from CMIS as a result of student fitting.
9. Resource will be available from Facilities Management to train appropriate staff in data entry, automatic scheduling and rooming and the maintenance of student class groups in CMIS.

Business volumes

Refer to the As-Is document for current business volumes.¹

7. Redesign Proposal(s)

Process Re-design

The business process has been re-designed to consist of 6 key stages refer to appendix A for the process map. The six key stages of the process are;

1. Stage 1 Requirements Identification to setup data, identify constraints, delivery patterns, event specifications and room requests
2. Stage 2 Scheduling to automatically schedule programme, modules students and staff to delivery patterns, event specifications and constraints
3. Stage 3 Location Allocation to automatically allocate rooms to room requests and constraints.
4. Stage 4 Review to review timetables and gain approval for change requests
5. Stage 5 Modify to process “approved” change requests
6. Stage 6 Issue to publish a range of timetables including module, student and staff time tables

Time line Re-design

The time line for producing the time table has been re-designed to capture the extra information required to automatically schedule and room the time table based on the programmes delivered, modules, student registrations, programme and module

¹ S:\JIS_TIMETABLING\Stream 4 – Timetabling Process\Products\As-Is\As-Is 2010.doc

Learning and Information Services



associations, delivery pattern, event specifications, room requests and constraints. Refer to appendix B for the To-Be time line diagram the activities are outlined below;

1. Load programme and modules - All active programmes and modules will be extracted from Banner loaded into CMIS tables using CMIS standard data transfer routines.
2. Verify Programme and modules – Each School will verify that all the courses and modules loaded for the School are active and current in the academic term.
3. Capture programme structures – The core, optional and elective modules for each programme and each year of the programme will be identified defined and entered into Banner (CAPP) and then extracted into CMIS tables. This structure data will be maintained in Banner (CAPP) and extracted and loaded into CMIS
4. Load programme structures – Courses and modules will be extracted from Banner (CAPP) and loaded into CMIS tables using CMIS standard data transfer routines. The clashing rules will be set up to indicate the core, optional and electives modules which can or cannot clash in timetabling.
5. Load staff data – staff data will be extracted from Trent and loaded into CMIS tables using CMIS standard data transfer routines. The exceptions will include ad-hoc contracts to cover short term teaching delivery for example guest speakers, and clinical staff which are not paid directly by the University but by NHS Trust.
6. Capture delivery patterns, event specifications and room requests – using agreed proforma the delivery patterns, event specifications and room requests for all teaching events will be captured. The data to be captured would include;
 - a) Delivery pattern including lectures, seminars, practicals, tutorials, workshops
 - b) Maximum student size for the group activities i.e. seminar group
 - c) Room requests for all activities i.e. type of room or specific room id
 - d) Event specifications for all activities i.e. possible start times for events
 - e) Lecturer information for all activities i.e. individual or team delivery
 - f) Module information for all activities i.e. module constraints on delivery
 - g) Duration and week ranges for all activities
 - h) Any equipment required
 - i) Resource rules i.e. lecturer availability
 - j) Event rules such as links, blocks, orderings and exclusions e.g. sequencing of events lecture followed by seminar
7. Capture staff constraints - using agreed proforma the constraints affecting staff availability for teaching will be captured for all teaching staff
8. Verify constraints – staff constraints will be verified to ensure all constraints have been captured.
9. Enter staff constraints – generic and individual staff constraints will be entered into CMIS.
10. Schedule and room core modules for prescribed and non-prescribed programmes using planned student numbers , staff constraints, delivery patterns and event specification and room requests entered. This will exclude student fitting.
11. Load student registrations, extract student association with programmes (enrolment) and student association with modules (registrations). Run student fitting on a daily basis to fit students to class groups. *Alternatively set a date in the calendar and run student fitting from an agreed date i.e. after all returning students have enrolled so that students can be allocated in alphabetical order of surname.*

Learning and Information Services

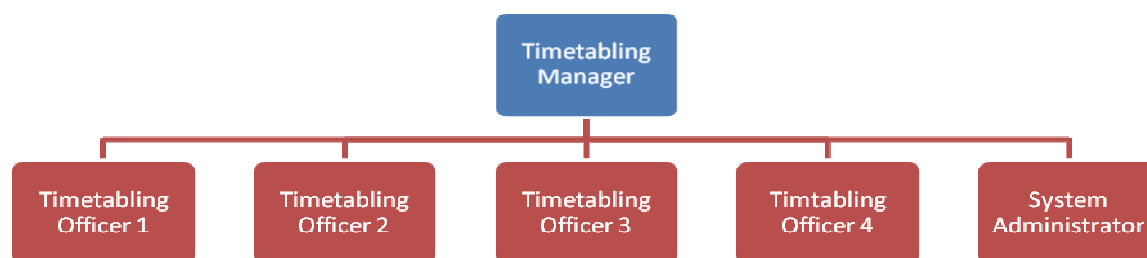


12. System specific dates
 - a) Banner Roll Forward where Banner system is rolled into the next academic year and all core modules on prescribed and non-prescribed programmes that are block coded are registered for returning students.
 - b) Returners Enrol where Banner system is open for returning students to enrol on courses and register on optional and elective modules
 - c) First Years Enrol where Banner system is open for first year students to enrol on courses and register on core, optional and elective modules.
13. Capture and verify staff constraints for staff paid by the hour (SPH) and late staff appointments.
14. Enter Constraints for staff paid by the hour (SPH) and late staff appointments.
15. Export the data from CMIS class groups to Banner student attendance and monitoring system (SAM). This information is required for induction week for class registrations.

(Note: Dates used in the timeline for 201112 are based on the dates identified in 201011)

Resource Requirements

The room booking unit should be re-named to the “Central Timetabling Unit” to reflect their new role and responsibility in the University. The Central Timetabling Unit would require at least 6 full time equivalent staff a possible organisation structure is outlined below. The Unit would consist of a Timetabling Manager, 4 Timetabling Officers and a System Administrator. The Timetabling Officer would be responsible for a number of Schools in terms of processing event specifications and room requests and scheduling and allocating rooms and would become the key contact or business partner for that school. The system administrator would be responsible for system administration in terms of system access, system security, the maintenance of estate data (buildings, rooms and equipment) and core data loads.



The School structure to support the new business process should include the associate head (senior executive) and a designated member of senior academic staff and administrative staff to act as points of contact for timetabling. The Associate Head (senior executive) would be responsible for the collection of staff constraints relating to staff availability for teaching and may include, by exception, the approval of staff constraints and the approval of change requests. The senior member of academic staff should co-ordinate the collection of delivery patterns, event specifications, and room requests and the senior administrator should deal with the operational aspects of CMIS including the maintenance of class groups in CMIS.

Learning and Information Services



Resource from SASS or Schools will be required to analyse programme structures and maintain programme structures in Banner CAPP. This should be staff with appropriate skills and experience with Banner (CAPP) and ODS to be able to analyse and build the structures and manage annual changes in programme structures and new programme developments. It is recommended that at least two full time be assigned to this task.

Principal Technicians should be responsible for reviewing the initial allocation of specialist rooms, re-scheduling and allocating rooms and technicians where appropriate based on the type of event, the equipments being used, health and safety considerations, risk assessment and clashing protocol. Also appropriate periods of induction, preparation and clear down should be assigned to the events where appropriate by Principal Technicians. The scheduling of specialist rooms needs to be co-ordinated with scheduling of general teaching rooms.

Home Room Allocations

The current home room and building allocation was completed in 2002 by Facilities Management, each year slight adjustments have been made to home room allocations based on the events booked in the time table and changes in student numbers. However as the institute has restructured significantly from Faculties to Schools and some Schools have moved location on campus and student numbers have changed Facilities Management should review the allocation of home buildings. The review of home buildings should be based on students registered in each School, the types of events booked i.e. large lectures or multiple class sessions and the capacities requested in the events. This is to ensure home rooms are allocated proportionally based on student numbers and type of teaching event and the capacities requested. Refer to appendix C for the current home room allocations.

Banner Recommendations

1. Block code registration should be implemented for all prescribed programmes and all core modules on non-prescribed programmes.
2. Modules undergoing validation should be entered on to Banner with status of “pending” so that they can be extracted for timetabling. The status should be updated from “pending” to “active” when the module has been validated.
3. Planned student numbers should be entered into Banner so that they can be extracted for timetabling and revised when the ADP is produced in June.
4. Banner (SAM) should be used as the recipient of class groups from CMIS. Class groups should be created using student fitting and maintained in CMIS not Banner (SAM)
5. Reporting facilities should be provided in the ODS to enable programme structures, compliances and associated data to be reported.
6. Reporting facilities should be provided in ODS to report on data integrity for programmes, modules and CRNs.



8. Implementation approach

Pilot Build

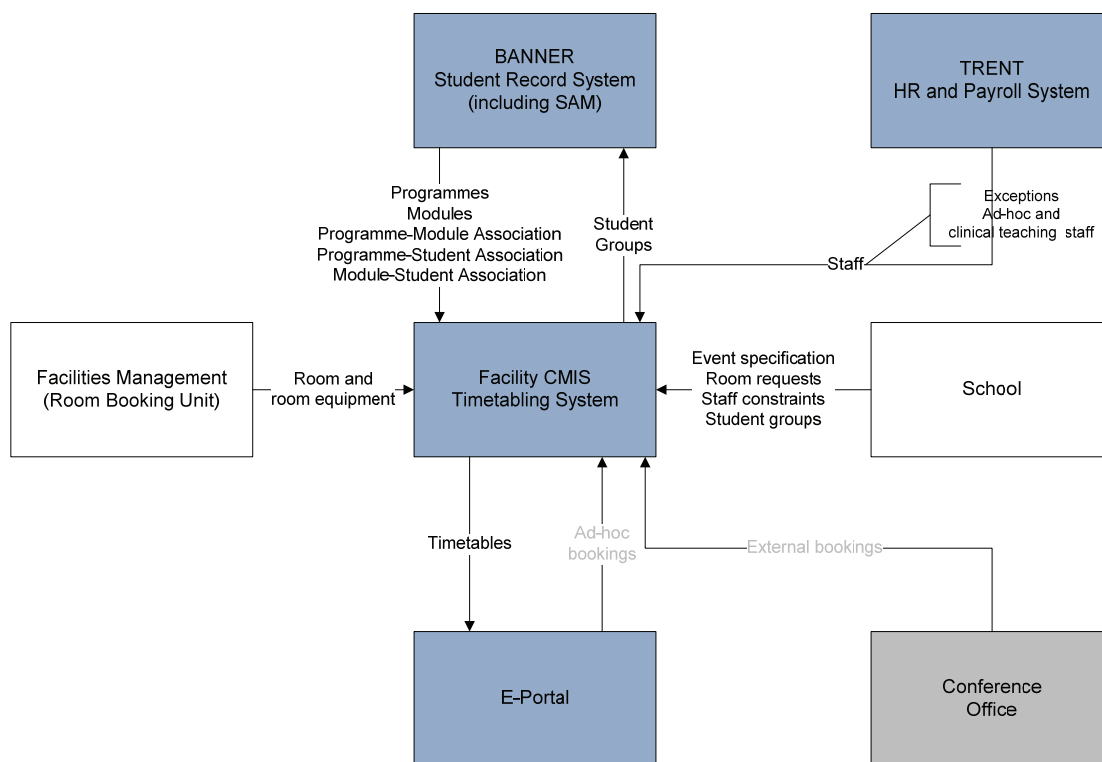
A pilot system will be built using Facility CMIS Version 10 under XP operating system in a separate project environment to CMIS Test and CMIS Live. The pilot will be set up to automatically schedule teaching events at Main campus, Burnley and Westlake campus in one data set to enable travel time between campus sites to be built into the scheduler. The scheduler will automatically schedule lectures, seminars, tutorial, workshops and practicals for all three sites. It will endeavour to room teaching events in to all general teaching rooms and specialist rooms assigned to the three campus sites. The pilot build will also be used to test the system interfaces developed in house to extract data from Banner and Trent. The project will endeavour to deliver at least three timetables for review and measure. The data to be used for pilot build and testing will be timetabling data submitted for 2010/11 semester one. The time line for pilot build and test is outlined in appendix D.

Resource Requirements

1. Principal technicians to capture information on specialist rooms and equipment that is not currently on CMIS
2. Resource from SASS or Schools with appropriate skills and experience to capture and analyse information on programme structures including prescribed programmes and non-prescribed programmes containing core, optional and elective modules
3. Resource from Schools to capture delivery patterns, event specifications and room requests for 201011 semester one, some of this can be gathered from the existing the dataset for 201011.
4. Resource from Schools to capture staff constraints where appropriate.
5. Resource from Banner Support team to provide training on Banner (CAPP) and ODS if required.

System Interfaces

1. Interface to Banner to extract for Main campus, Burnley and West lakes programmes, modules, programme to module associations (programme structures), programme to student associations (student enrolments), and module to student associations (student registrations on CRNs).
2. Interface to Banner (SAM) to load student groups created as a result of student fitting in CMIS and to maintain these groups in CMIS and regularly (nightly or during the day) load the student groups into Banner (SAM).
3. Changes to Banner (SAM) to accommodate the data to be imported from CMIS, this may include table changes for group creation.
4. Interface to Trent to extract staff information. This will academic staff delivering teaching, technicians supporting teaching and administrative staff that may book rooms. The exceptions will include manual staff, ad-hoc staff employed to deliver ad-hoc teaching and clinical teaching staff paid by NHS Trust who are not on Trent.



Performance Metrics

The metrics to assess and measure the revised business process and automatic scheduling and rooming process as part of the pilot build should include metrics on estate utilisation and student experience;

Estate utilisation

- The number of teaching rooms centrally pooled. If the number of rooms centrally pooled is less than 80% it indicates an institution is not optimising the teaching stock (SUMS).
- The room frequency is the number of occasions a teaching room is used. If room frequency is greater than 70% it indicates good practice (SUMS).
- Room occupancy is the best fit of teaching group size to room capacity. Low occupancy indicates poor fitting. (Occupancy is based on booking not attendance)
- Room booking cancellations based on bookings made and confirmed and then later cancelled. The number of cancellations for 200910 was 42,000 booking hours, 23% of the total booking hours and for 200809 just over 40,000 booking hours, 21% of total booking hours.
- Room changes in terms of the number of changes issued after publication and the reason for change
- Bookings and room utilisation at key periods where we would like to increase occupancy i.e. 9-10 am Monday to Friday and after 4 pm on Friday
- Room utilisation from Monday to Friday as good practice guides indicate that there should be no more than 20% differentiation between days.



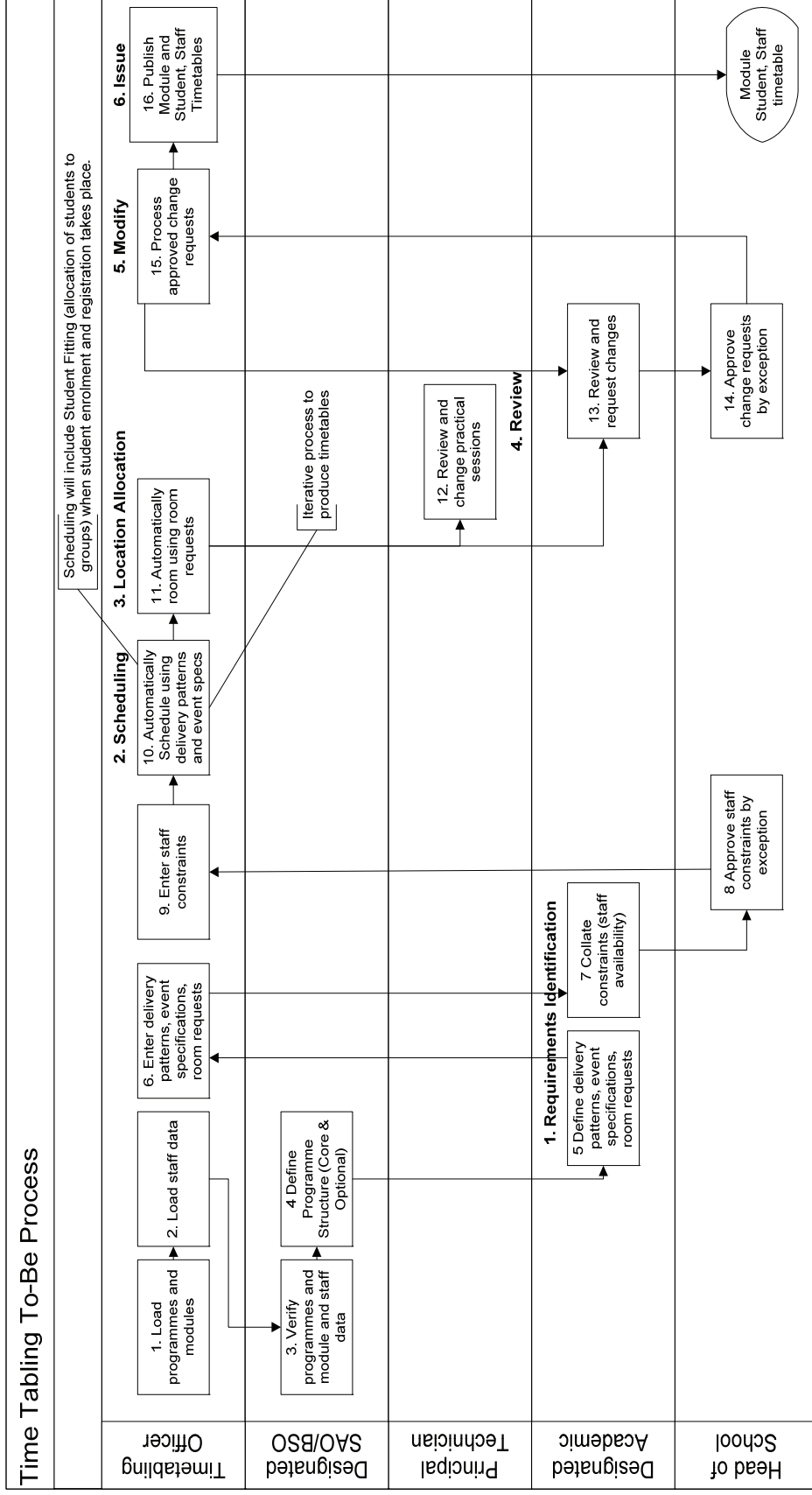
Student Experience

- The publication of timetable in terms of the completeness and quality in delivering an integrated time table containing all teaching events in general and specialist teaching rooms.
- The communication of changes to the timetable in terms of the timeliness and accuracy of the communication as changes are made.
- The number of events booked inside home rooms or home zones therefore minimising travel time across the campus.
- The number of students who receive study free periods compared to commitment in the policy which may be one day per week.
- The number of clashes on programmes, modules and students and an analysis of the reasons for clashing
- The number of related events (based on programme structure and event links) that remain in the same room or building
- The minimum and maximum number of consecutive teaching hours delivered to students and assessment if this is within reasonable boundaries.
- The number and period of comfort breaks provided to students the time table.

Learning and Information Services



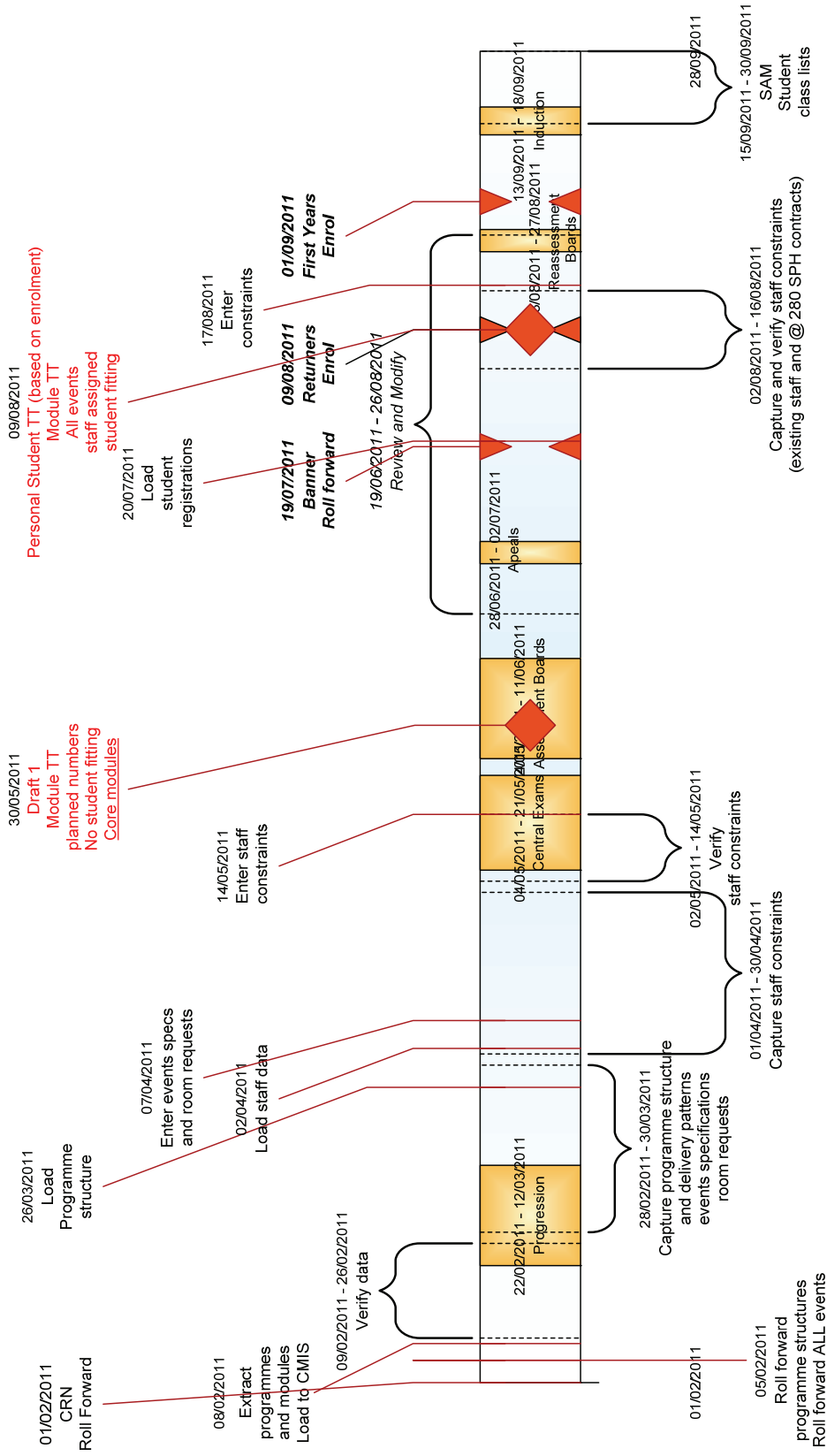
9. Appendix A To-Be Process Map



Learning and Information Services

10. Appendix B To-Be Process Time line

Timeline for time table To-Be Process 2011-2012 Timetable (DRAFT)



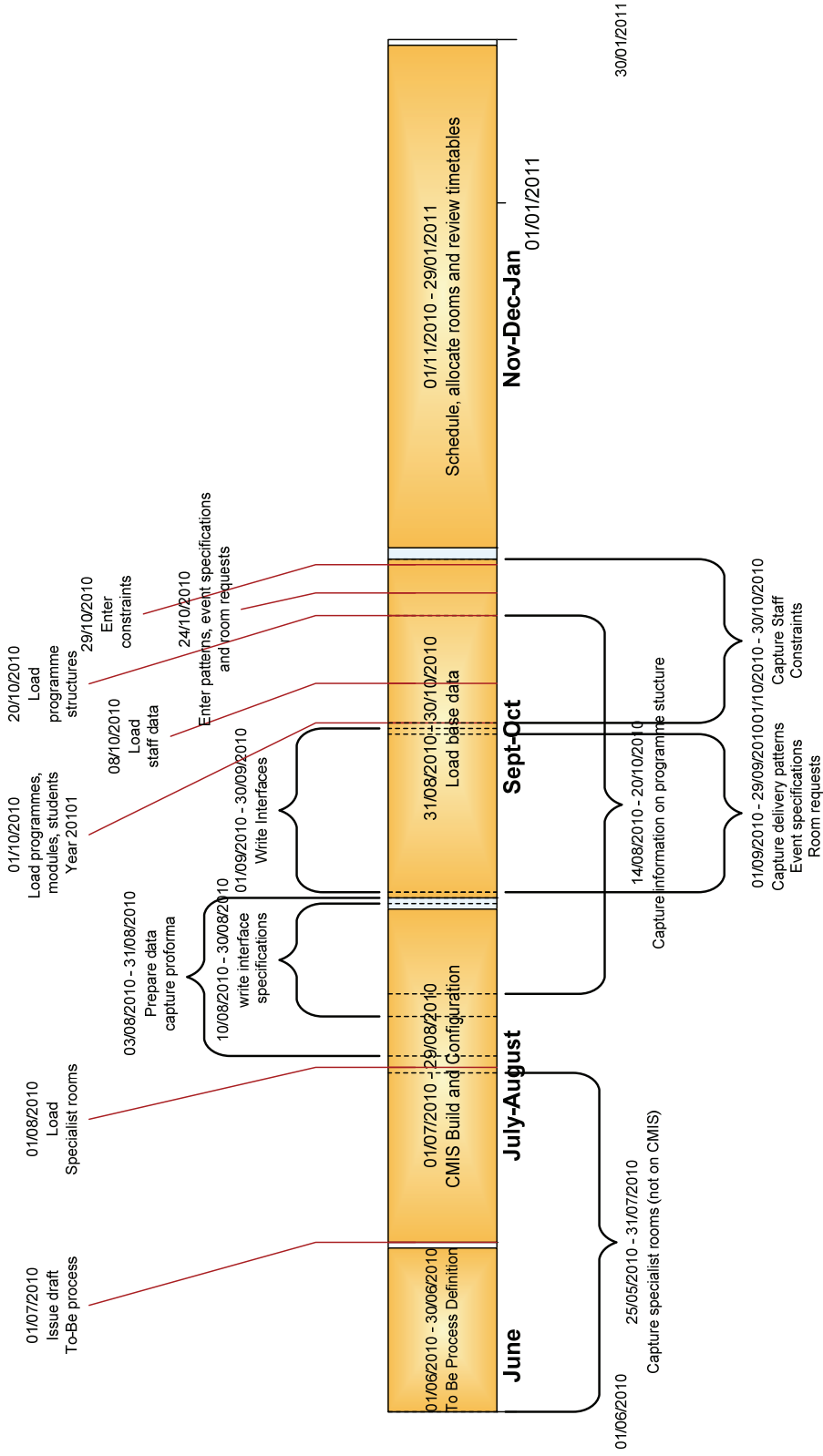
Learning and Information Services

11. Appendix C Home Room Allocation

School	Rooms	Central Allocated Rooms (room capacity) Priority room in Red									
Built & Natural Environment	3	HB234(50)	HB235(50)	KM111(50)							
Combined Honours	0										
Computing, Engineering & Physical Sciences	5	CM101(54)	KM012(48)	KM014(32)	KM015(24)	LE006(28)				CM011, CM018, CM025, CM026, CM033, CM034	
Creative & Performing Arts	2	ME109(18)	ME110(20)								
Dentistry	0										
Design	1	VB121(28)									
Education and Social Science	5	LH127 (32)	LH201 (32)	LH225 (40)	LH226 (32)	LH227 (32)					
Forensic & Investigative Science	3	LE109 (46)	LE110 (46)	MB041 (40)							
Futures	0	ME314	ME315	ME317	ME320						
ISCRI	1	HA108 (40)									
Journalism, Media and Communication	9	FY417 (40)	FY418 (30)	GR275 (32)	GR276 (32)	GR278 (32)				GR350 (32)	HA129 (50)
Lancashire Business School	13	ME325 (38)	ME220 (36)								
		BB014 (28)	BB015 (40)	BB016 (42)	BB105 (36)	BB137 (44)				BB142 (48)	GR358 (32)
		GR359 (39)	HA142 (40)	HA308 (25)	HA339 (40)	VE024 (24)				VE026 (24)	
Lancashire Law School	5	HB110 (22)	HB111 (26)	HB206 (30)	HB207 (30)	HB208 (20)					
Languages & International Studies	9	FY114 (30)	FY214 (30)	FY303 (30)	FY316 (30)	FY318 (18)				FY320 (34)	FY323 (30)
		FY412 (30)	FY416 (26)								
Nursing and Caring Sciences	15	BB115 (10)	BB245 (72)	BB355(60)	BB406 (24)	BB412 (24)				BB437 (10)	BB438 (130)
		BB443 (10)	BB444 (20)	BB445 (20)	BB447 (64)	HA320 (58)				VE057 (39)	VE060 (57)
		VE080 (80)									
Pharmacy & Biomedical Science	1	MB038 (32)									
Psychology	2	DB247 (40)	DB337 (48)	DB325							
Public Health Clinical Sciences	5	BB111 (40)	BB138(22)	HA115 (40)	HA117 (48)	HA223 (46)					
Social Work	3	HA326 (24)	HA337 (38)	HA338 (38)							
Sport, Tourism & the Outdoors	5	BB139 (34)	BB140 (42)	GR355 (32)	GR357 (32)	VE028 (24)					

Learning and Information Services

12. Appendix D Pilot Build Timeline



Learning and Information Services

