

Timetabling and the efficient use of space

Supporting the preparation of timetables can involve one of two strategies.

Strategy 1: Staff requests for classes at specified times in identified rooms.

1. The process involves a number of tasks.

Staff can request a booking for a room based on a prepared timetable. If the room is not available the member of staff can:

- 1 change the time of the booking;
- 2 retain the time of the booking but agree with the timetabler an alternative room.

Each of these actions involves the acceptance of reasonable compromises. Judgements take into account preferred teaching times and spaces. The approach does not automatically involve significant changes in space efficiency but it does aid the preparation of clash-free schedules.

A major strength of this system of timetabling is that all staff are familiar with the process and are confident of its effectiveness.

Strategy 2: Staff specify the type of room required in a defined part of the week.

2. The timetabler decides on the time and location of classes. The software has been established to reflect the accepted rules for timetabling. For example:

- 2.1 the length of an agreed basic timetable slot can be used to define the duration of any timetabled event;
- 2.2 the duration of the teaching week and the teaching year can be adjusted to reflect the operation of any institution;
- 2.3 the identification of courses or modules that cannot be undertaken in combination and can, therefore, be timetabled at the same time;
- 2.4 the sequencing of timetables can be manipulated so that, for example, most staff get a preferred timetable;
- 2.5 the non-availability for teaching at identified times by individual members of staff;
- 2.6 the scheduling of research time in 4 or 8 hour blocks of time;
- 2.7 defined sets of rooms by room type, capacity, building or department.

A request for the timetabling of an activity fixed by day and time, room type and staff availability can be accepted by the scheduling system. The software generates an integrated set of room, staff and course timetables.



Stellae Limited
Corpus Christi House
West Walk
Leicester
LE1 7NA

T +44 (0)116 249 3900
E dgr@stellae.com

www.stellae.com



3. Possible staff responses to automatic scheduling

A weakness of a scheduling system is that staff can be reluctant to leave the allocation of times to the software. One response is for staff to define all activities as fixed to a given time, day and specified room. This means, in an extreme position, no scheduling is possible. Reassurances can be provided by:

- 3.1 identifying a timetabler for each group of departments or a faculty;
- 3.2 identifying a member of staff from a department or faculty to liaise with the timetabler;
- 3.3 identifying approved times when academic staff are not available for teachings;
- 3.4 preparing student, staff and room timetables for assessment by departments prior to the commencement of the teaching year;
- 3.5 sharing financial gains from improved space utilisation levels between the institution and individual departments;
- 3.6 including timetables in the evaluation of course submissions to ensure they can be timetabled;
- 3.7 identifying a space management team chaired by a senior member of staff. The group can resolve any difficult issues arising between timetablers and staff. The committee can also co-ordinate the submission of activities for scheduling. Timetabling processes and procedures and the allocation of funding generated by greater space efficiency, can also be the responsibility of the space management group.

Timetables are finalised on the basis of enrolled student numbers. After about six weeks of teaching the use of rooms needs to be surveyed. A calculation is made of space utilisation levels based on the survey and the timetables. The results are submitted to the space management team. The results and inconsistencies can also be shared with heads of departments.

4. Potential benefits of the scheduling process

The scheduling process generates an integrated set of room, staff and course timetables. The possible methods of accommodating the timetabling of different activities are agreed with the staff prior to the scheduling process. For example:

- 4.1 staff can be assumed to be always available other than at times confirmed by their heads of department at acceptable levels of space utilisation;
- 4.2 room sets associated with departments can provide the context for selecting accommodation of the appropriate type and capacity;
- 4.3 groups or classes can be scheduled on the basis of student availability and multiple modular slots;
- 4.4 agreed research time can be timetabled based on one 8 hour session or two 4 hour sessions per week;
- 4.5 departmental meetings can be scheduled based on activities involving identified staff and no students.

The timetabling process involves no, one or many groups with no, one or many staff in no, one or many rooms. Each data set can be allocated any set of timetabled weeks. The timetable strategy requires staff to understand the financial implications of space utilisation and the impact of improving timetabling procedures. Documents can be produced to establish constraints on the quality of timetables.

5. An evaluation list of required software capabilities can be grouped into:

- 5.1 set up and activity inputs;
- 5.2 scheduler capabilities;
- 5.3 timetable formats;
- 5.4 report options.

6. Screens can be displayed to illustrate the use of the software.

6.1 Set up and activity inputs

A series of screens can define timetable slots for the teaching day and the teaching year. A set of input screens will:

- 6.1.1 identify staff names, approved weekly non-availability times and required non-teaching weeks;
- 6.1.2 define departmental sets of rooms, room types, capacities and availabilities based on required student class hours;
- 6.1.3 list group sets, modularity rules and scheduling rules;
- 6.1.4 set the slot sequence so that the university can disappoint the least number of staff or students when allocating times to groups and staff;
- 6.1.5 set a slot sequence, if required, which runs counter to existing slot preferences;
- 6.1.6 prioritise multiple slot modular courses.

7. Activities

The options available should include:

- 7.1 a series of screens defining timetable slots, the teaching day and the teaching week;
- 7.2 a series of screens that can identify academic teaching staff, their approved non-availability for teaching by week and slots per day;
- 7.3 a series of screens to identify the non-availability of groups by slot and teaching week;
- 7.4 activities for timetabling including the identifying of teaching weeks, group sizes, course programmes, lecturers, lecturer weeks and room sets.

Sample window for each of the set up and activity forms may be displayed to illustrate the user interface.

8. Research

Many UK universities identify an annual teaching load in the order of 540 hours. This total represents 15 teaching hours per week. Given an assumed salary level for academic staff in the UK of £37,800 per year, the cost of teaching staff is an estimated £70 per hour. The provision of 8 hours of research time over a 36 week teaching year represents an investment of approximately £20,160 per year. This expenditure represents a substantial budget of over £2million for each 100 members of academic staff.

Research should be reviewed annually on the basis of relevant criteria. These include:

- 8.1 publication records;
- 8.2 ranking of publishing journals;
- 8.3 successful completion of studies by research students;
- 8.4 generation of income to support research projects and costs;

Research support should not be considered an unaudited or self-justifying commitment.

9. The evaluation of an automatic scheduling system involves a number of distinctive elements:

- 9.1 ease of use based on a windows system and a logical sequence of tasks;
- 9.2 the extent to which the software can be adapted to reflect the teaching and research policies and procedures of individual institutions;
- 9.3 the efficient and effective entry of activities to be scheduled;
- 9.4 the ease with which flexible scheduling of activities can occur in order to finalise room, staff and student timetables;
- 9.5 statistical analyses concerning space utilisation levels based on room types, room capacities and room sets for specified periods of time.

Timetabling is a predictive process based on anticipated enrolment levels and group sizes. The use of timetable data always over-estimates space utilisation levels. Space efficiency should be reviewed on the basis of actual room usage.

A scheduling system can be used to timetable any activity including refurbishment work. Timetables can be prepared to accommodate staff meetings and rolling maintenance programmes.