



PANNASOFT OPTIMA™

The Optimized Scheduler
optimized scheduling on the go!

Resource scheduling in most organizations generally encountered similar problems such as accommodating staff preferences and demands, irregular shift patterns, shortage and excess of manpower distribution and many more. All these constraints have to be met in order to maximize staff satisfaction and have efficient utilization of the workforce.

Pannasoftware Optima™ is an optimized staff scheduler that assists in finding optimal solutions to resource scheduling. It takes into consideration your broad-based requirements as well as your specialized requirements (soft and hard constraints). Moreover, it is easily customizable and scalable to any type of your resource scheduling problem.

Pannasoftware Optima's optimization engine uses state-of-the-art artificial intelligence based on evolutionary computation model to produce optimized and feasible solutions for very large and complex optimization problems taking into consideration feasible criteria and optimization objectives.

Main Features

Pannasoftware Optima™

- ❖ considers your broad-based requirements as well as your specialized requirements
- ❖ is flexible, customizable and scalable to various types of scheduling problems
- ❖ generates optimized schedules quickly and easily without hassle
- ❖ is platform independent, enabling seamless integration to existing systems

Benefits

Pannasoftware Optima™ simplifies the complex and time-consuming tasks of resource scheduling into an organized and fluid process. Errors are greatly reduced on constructing schedules and it saves organizations time and resources on complex scheduling activities.

Pannasoftware Optima™ is suitable for use in education institutions, health care institutions, logistic companies, event organizing companies and business enterprises.

Sample Application – Education Institutions

Pannasoft Optima™ aids education institutions in finding optimal solutions to resource scheduling with consideration to multiple constraints using the evolutionary computation model.

Consideration is given to constraints such as undesirable periods, maximum number of teaching hours, minimum lecture/tutorial/lab hours required by each subject and minimal traveling distance between adjacent periods.

Table 1 lists the actual hard and soft constraints based on the requirements gathered from a reputable local private college in Malaysia. The requirements encompassed 26 Programs, 254 Subjects, 76 lecturers and 82 rooms.

Table 1: Hard and Soft Constraints	
Hard Constraints	Soft Constraints
Clash between lecturer's slots	Lecturer's preferred slot: Allows lecturer to select preferred slots
Clash between room's slots	Undesirable slot: Lunch time slot, evening slot, weekend slot
Number of students exceed room size	Unpreferred lecturer's slot: Avoid assigning lecturer with unpreferred slot
Spread a subject across days in a week	Room type: Certain classes are preferably conducted in specific room type (e.g., lecture hall)
	Room location: Certain classes are required to be conducted in specific location/sector
	Maximum hours per day for a student: Avoid having more than 4 hours of class each day for a student
	One empty slot between classes: Try to schedule at least one empty slot between classes to allow transition
	Clash among student's schedule: Avoid having schedule clashing among programs
Other Considerations	
Lecturer's "must have" slot	
Allowing certain lecturer to reserve specific slots	
Class size	
Avoid assigning big rooms to small classes	

Pannasoft Optima™ produces outputs which include

- **Schedule by program:** Generate one schedule for each program
- **Schedule by lecturer:** Generate one schedule for each lecturer

Outputs are flexible and can be customized according to the user's needs.



Result Optima

Batch		2005 - Semester 2005													
		Search		Reset											
BSc Computer Science (Semester 2005)															
	Subject	Lecturer	0800-0900	0900:1000	1000:1100	1100:1200	1200:1300	1300:1400	1400:1500	1500:1600	1600:1700	1700:1800			
Monday	Foundation of Computer Science	Mr. Liew Fong San					Building A, Room 6				Building A, Room 14				
	Introduction to C Programing	Dr. Peter				Building B, Room 5									
	Linear Algebra & Logic	Dr. Chan Kwok Khor			Building A, Room 1										
Tuesday	Introduction to E-Commerce	Dr. Linda Lai				Building A, Room 1									
	Software Engineering	Mr. Micheal Goh				Building B, Room 9					Building B, Room 5				
Wednesday	Foundation of Mathematics	Dr. Linda Lai				Building A, Room 8					Building B, Room 3				
	Linear Algebra & Logic	Dr. Chan Kwok Khor				Building A, Room 2									
Thursday	Introduction to C Programing	Dr. Peter									Building A, Room 12				
Friday	Foundation of Computer Science	Mr. Liew Fong San						Building A, Room 10							

Result Optima

Batch		2005 - Semester 2005													
		Search		Reset											
Dr. Ahmad (Semester 2005)															
		0800-0900	0900:1000	1000:1100	1100:1200	1200:1300	1300:1400	1400:1500	1500:1600	1600:1700	1700:1800				
Monday						Business Analysis & IT - Building A, Room 2 (BSc Information Technology)									
Tuesday															
Wednesday															
Thursday						Business Analysis & IT - Building A, Room 12 (BSc Information Technology)									
Friday															
Saturday															

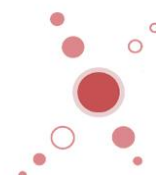
Output by Program or Lecturer

BENEFITS FROM USING PANNASOFT OPTIMA™

- ❖ student's enrollment and satisfaction will increase from minimized course timing conflicts
- ❖ teachers' or lecturers' productivity and quality of service will increase by accommodating their preferred schedule
- ❖ cost and resources are reduced from minimized use of facilities
- ❖ examination schedules are optimized with respect to time clashes
- ❖ time is freed for administrator to focus on other important issues instead of spending hours designing a best-fit schedule to accommodate all constraints

As a result, Pannasoft Optima™ saves education institutions time and resources while minimizing cost and errors.

Optimizing Businesses
Through Intelligence





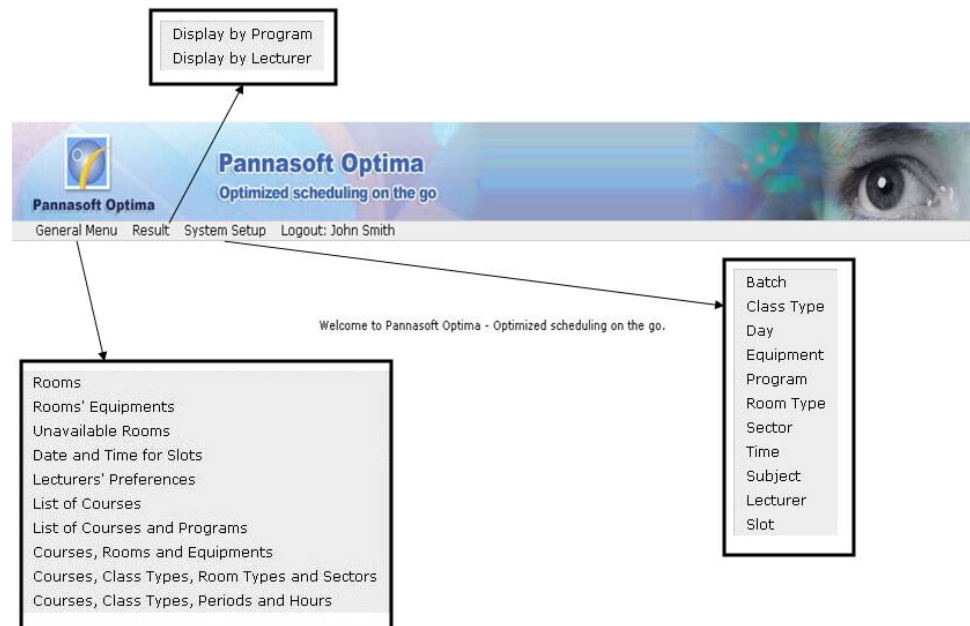
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Main Menu

**Optimizing Businesses
 Through Intelligence**



Rooms' Equipments

No	Batch	Room	Equipment
3	2004 - 2004 semester	MTR-CL - room MTR-CL Room Type : CL - Computer Lab Room Capacity : 24 Sector : C - Building C Sector Location Name : LOT45-L4	CAL - Scientific Calculator
2	2004 - 2004 semester	MTR-CL - room MTR-CL Room Type : CL - Computer Lab Room Capacity : 24 Sector : C - Building C Sector Location Name : LOT45-L4	WHB - White Board
1	2004 - 2004 semester	MTR-CL - room MTR-CL Room Type : CL - Computer Lab Room Capacity : 24 Sector : C - Building C Sector Location Name : LOT45-L4	MAC - Machinery

- Rooms
- Rooms' Equipments**
- Unavailable Rooms
- Date and Time for Slots
- Lecturers' Preferences
- List of Courses
- List of Courses and Programs
- Courses, Rooms and Equipments
- Courses, Class Types, Room Types and Sectors
- Courses, Class Types, Periods and Hours

Courses, Class Types, Room Types and Sectors

No	Batch	Course List	Class Type	Room Type	Sector
3	2004 - 2004 semester	CR1 - Course List 11 Course Size : 12011 Course Subject : MKT321 - Aspects of Services Marketing Course Lecturer : SAND - Mr Santhana Dass	FLD - Field Work	CL - Computer Lab	C - Building C
2	2004 - 2004 semester	CR1 - Course List 11 Course Size : 12011 Course Subject : MKT321 - Aspects of Services Marketing Course Lecturer : SAND - Mr Santhana Dass	TUT - Tutorial	CL - Computer Lab	C - Building C
1	2004 - 2004 semester	CR1 - Course List 11 Course Size : 12011 Course Subject : MKT321 - Aspects of Services Marketing Course Lecturer : SAND - Mr Santhana Dass	LEC - Lecture	CL - Computer Lab	C - Building C

Class Type

No	Code	Description	Status	Batch
6	MISC	Miscellaneous	Activate	2004 - 2004 semester
5	ART	Art Work	Activate	2004 - 2004 semester
4	LEC	Lecture	Activate	2004 - 2004 semester
3	LAB	Lab Work	Activate	2004 - 2004 semester
2	TUT	Tutorial	Activate	2004 - 2004 semester
1	FLD	Field Work	Activate	2004 - 2004 semester

- Batch
- Class Type**
- Day
- Equipment
- Program
- Room Type
- Sector
- Time
- Subject**
- Lecturer**
- Slot

Subject

No	Code	Section	Description	Status	Batch
109	MAT112J	A	Mathematics	Activate	2004 - 2004 semester
108	CHM112J	A	Chemistry	Activate	2004 - 2004 semester
107	BIO112J	A	BIO112J	Activate	2004 - 2004 semester
106	LAN1003	A	Malaysian Studies	Activate	2004 - 2004 semester
105	STA112A	B	Statistics	Activate	2004 - 2004 semester
104	STA112A	A	Statistics	Activate	2004 - 2004 semester

Lecturer

No	Code	Name	Status	Batch
59	KLBL	Kathleen Lee Bee Lan	Activate	2004 - 2004 semester
58	JANA	Janitha Nadarajah	Activate	2004 - 2004 semester
57	GANE	Ganeshwari	Activate	2004 - 2004 semester
56	FRCH	Frankie Cheah	Activate	2004 - 2004 semester
55	EKHH	Elsie Kho Hui Hui	Activate	2004 - 2004 semester
54	JQSL	Julia Quay Swee Lin	Activate	2004 - 2004 semester
53	PHSC	Phang Soon Cheong	Activate	2004 - 2004 semester
52	GKEH	Gurmit Kaur Eip Hop	Activate	2004 - 2004 semester

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