Project Fuji

Background of Fuji Ice Palace

Fuji Ice Palace has come a long way from its establishment in 1974 when its first premises opened in Taman Jurong. Following relocating, its current location is situated at Jurong Entertainment Centre. It has been located there since September 1994. With the closure of competitor Kallang Skating Ring, Fuji Ice Palace is now the sole provider of skating facilities.

Problem Statement and Study Justification

The quality of ice is an important element in determining an enjoyable skating experience. To maintain good quality of ice, resurfacing is extremely crucial. Thus the resurfacing timings are of utmost priority to Fuji Ice Palace. Their resurfacing timings are based on human traffic to the rink many years ago. This may not be a clear reflection of the human traffic today due to the changing trends. We found this to be a serious problem because the current resurfacing timings may not be reflecting the actual need now. Fuji Ice Palace could be resurfacing more times or fewer times than necessary.

Hence as our primary objective, our group devised a plan using Microsoft Excel© to map out new resurfacing timings given the current human traffic. We observed that the human traffic differ greatly on weekends, weekdays and on student's promotion day. Therefore, we came out with three different resurfacing schedules for the three different days. In this way, there will be greater accuracy as compared to the previous standard timings. Ice would be better maintained and efficiency increased.

On top of that, Fuji Ice Palace has a relatively small management, with only 4 executives in charge of all the daily processes, namely operations, accounting, marketing and Fuji Ice Skating School.

For Fuji Ice Skating School, the executive in charge has many duties under her care – mainly the coordination of the School's daily schedule, enquiries from parents and any events in connection to the School. Out of all her duties, the coordination of daily schedule is particularly long and tedious. The process is as follow below:

1. A Parent or Student signs up for the lesson at the Information Counter.
2. The Parent or Student fills up a Form *(the form is formatted such that each coach has one and it records monthly bookings),* ticks out which date(s) he or she prefers.
3. The Parent or Student pays to confirm booking.
4. The Executive of Fuji Ice Skating School would then take the monthly records of each coach, transfer the data into an excel sheet for her own convenient access and finally file the booking form up.
5. The Coach would constantly have to go to the Information Counter to check their schedules. They do not have a personal copy of their schedule that can be constantly updated for their reference.

With such a lengthy process, much time is placed on the coordination and compiling of coaches' schedules. Thus, as a secondary objective, we have used Microsoft Excel© and Microsoft Visual Basic© to create a model that would effectively remove all data entry work *(Process No. 4)* and help coaches monitor their daily schedules *(Process No. 5)*.

Primary Objective – Resurfacing Timings

Data Sources

Data collection was one of the most important parts of our model. It determines the outcome of our model. As the saying goes GIGO (garbage in garbage out), the input had to be accurate for our model to be realistic. Hence, we had to ensure the accuracy of our data. We spilt the work of observations by going down to the skating rink in pairs on several weekdays and weekends for 2 weeks. During this time, we recorded an input and output table on excel based on observations. In addition to this, we also handed out surveys to skaters to gauge their response on the ice in relation to their skating experience. The input couldn't have been complete without the support of the staff. The marketing executive and operations manager provided us much valuable information to complete our analysis. This information included the timings of the peak human traffic, the rough estimate of the number of people per time slot and many others. With this information, we can more clearly understand the current operations and how our group can seek to improve operations with regard to the resurfacing timings.

After collection of the data, we set out to organize it before embarking on using excel. As said previously, we understand that there is a pattern of human flows for 3 different days namely- weekends, weekdays as well as student's promotion day. We categorized our data accordingly and also coupled with the information given by the staff, we came out with the excel spreadsheet. There are three different spreadsheets for the three patterns. This is to ensure that resurfacing timings are not uniform despite changing human traffic but rather it accommodates itself to the increasing or decreasing human flow. In this way, we are able to see the pattern of resurfacing for days with differing crowds.

Model Formulation and Functions used

The 3 models are derived after entering our input data, decisions and assumptions we have made. The formulas for all the models are essentially the same. The only difference is the figures for inputs and the vlookup tables. The minimum, average and maximum number of people coming in at the 3 timings is derived by multiplying the % of crowd at that respective timing by the minimum, average and maximum number of people for the day.[1]

The number of customer arrivals from the public in the various time slots is derived using random simulation with reference to the vlookup tables. The figures we have obtained from the inputs above will help us gauge if our random simulation falls in the range. In our 3 vlookup tables for the different timings, we have the no. of people coming in at 10 min time slots, the % of occurrence (based on our observations) and the cumulative probability, which is derived by summing up the % of occurrence. [2]

The number of people from school is derived from our master sheet, which will be elaborated in the later parts. Hence, by adding up the No. of people in from public and school, we can get the sum of total customers who has gone into Fuji Ice Palace. [3]

With this data, we will be able to find out how many times Fuji Ice Palace must resurface a day and their respective timings. First, we must create an input table for the criteria to re-surface. Resurfacing takes place after 100 people has gone into the rink. However, we must bear in mind that the max no. of customer arrival is 13 and we may not get exactly the 100th value in the "No. of people who has gone in" column, so we must create an interval of 13, for e.g. Resurface 1 will take place when 95-108 people has gone in. In order to get the re-surfacing timings, we will have to apply the "IF" function, such that if the cell falls between the criteria (e.g.: 95-108) and the previous few cells are empty, the word "Resurface 1" will show. The previous few cells must be empty because there is a probability that "Resurface 1" may show up many times, for e.g. when the "No. of people who has gone in" cell shows 95, the next cell shows 98 and the next cell shows 103.[4]

In order to provide a neater table, we have drawn up a final table for our client to view the re-surfacing timings and no. of times to re-surface at a glance. We have used the "ISNA", "Index" and "Match" functions, such that if the cell in "Resurfacing" column matches "Resurface 1", the timing will appear in the final table. If there is no exact match, "No resurfacing" will appear. We have used the "Count" function to obtain the no. of resurfacing times.

Finally, we carried out 100 random simulations to obtain the average no. of re-surfacing times and their respective timings as shown in the "average operation" worksheet.

Assumptions and Limitations

[1] Refer to appendix 1
[2] Refer to appendix 2 & 3
[3] Refer to appendix 3
[4] Refer to appendix 3 & 4

Every model couldn't be complete without its assumptions and limitations. One assumption for the resurfacing model is basically that different days will have different crowds. The distribution of the crowd is also different day to day. The time slots are also divided differently for the days. For example, the time slots for weekdays and student promotions is 10-12pm, 12-4pm and 4-8pm while on weekends, the time slots are 10-12pm, 12-6pm and 6-8pm. The percentages for the crowd also vary according to our assumption which we derived from our input table as well as information from the staff.

Another assumption we made is that after 8pm, no customers will come in. This is a very valid assumption because the skating rink closes at 9pm and the minimum skating hours are at least 2hrs. Hence, no rational customer will pay to come in and merely skate for an hour. This is therefore a sound assumption. Yet another important assumption is that customers come at an interval of 10 minutes. Some people may question why this choice of 10 minutes and not 5 minutes or even ½ an hour. The rationale behind this is very simple. 5 minutes may be too short an interval. There might not even be any skaters at the 5 minutes mark. ½ hr is too long for an interval because too many people might have come in during this period and this could make data collection very cumbersome as well as inaccurate. Hence, the 10 minute interval was the most ideal choice. We also assumed the probability of the number of skaters coming in at every 10 minutes interval. Our assumption is basically based on our observations as well as staff information. Notice that the probabilities for 4 or more skaters coming in at every 10 minute interval are actually quite high. This is because of the "group of four" package that Fuji Ice Palace offers whereby groups of four can skate unlimited hours once they pay a certain special rate. The models specified can only be used to account for people coming in one by one and not by gender, age or groups.

Problems encountered

Inevitably, we encountered some problems in formulating our model as well as evaluating our results. The first major problem we faced was assignment of probabilities of the number of skaters coming in at the various time slots. It was hard at first because we only had our observations for the past 2 weeks. We were afraid that the sample size of the past 2 weeks were too small and hence might not reflect the accuracy of the probabilities. We basically solved the problem by seeking the help of the staff. Upon the enquiries of the probabilities of the number of skaters, we had a more accurate data base that enabled our model formulation.

Yet another problem that we faced was attempting to calculate the number of people from school. This is an important component because it also constitutes to the total human traffic at any one time. The difficult part was trying to link the cells to the master spread sheet whereby the coaches' schedules indicated the number of students per day. Upon much trying, we manage to do so with the help of the IF function, AND Function, Match and Index Function as shown in the spread sheet.

Secondary Objective – Fuji Ice Skating School's Monthly Lesson Booking

Date Sources

Based on our second objective, we first needed to find out more about their coaches' schedules. Although information on the coaches and their available coaching time can be retrieved from the company's website, we realized that some of the coaches' schedules can only be confirmed with the management. Moreover, the data provided in the website may be outdated. Through our interaction with the friendly staffs of Fuji Ice Palace, we found out how their booking system actually worked *(mentioned above in Problem Statement and Study Justification)*. For instance, some coaches have flexible coaching hours because they planned their coaching timings around family. We also managed to clarify our doubts with the management about how their skating school functions.

Model Formulation

After collecting all the necessary data, we decided that we should create a monthly coaching schedule, which should be printer-friendly, for each individual coach so that they will know who have booked for their lessons on which day and at what time. By doing so, the coaches would also be able to enjoy the flexibility of changing their coaching timings on a monthly basis. In order to simplify the process of entering their coaching availability in a week for a particular month, we created a separate worksheet called the "Coach Schedule" for all coaches to key in their coaching time for each day in a week. In this worksheet, we made an assumption that each coach would have a maximum of two break intervals and hence created 3 input sessions of "In" and "Out" timings. We felt that the assumption is reasonable because coaches will only need to have two breaks for lunch as well as dinner.

After inputting their coaching time for each day in a week, the information will then be linked to appear on their individual coaching schedule so that students under each coach will be able to know when their coach is available for booking of lessons. As we wanted to make the booking system more user-friendly, we designed a main menu whereby students can easily select on their coach and then proceed to view his/her coaching schedule for the month. In each of the individual coach schedule, two buttons are created. One would be for students to return to the main menu after they have finished booking or if they have clicked on the wrong coach. Another for students to book their lessons in that month.

To enable a quick booking procedure *(mentioned above in Problem Statement and Study Justification - Process No. 1-3)*, we created an automated booking system – Easy Booking System using Microsoft Visual Basic©. This could be used by employees at the Information Counter or a kiosk could be set up for self-service booking by parents or students.

Easy Booking System is created to help facilitate only the booking of lessons. It does not take into consideration which skating level class the parent or student wants to book or the mode of payment (if it's a self-service booking kiosk).

This is how Easy Booking System works:

Step 1: Select the Coach you wish to make a booking. Parent or Student *(User)* clicks on Liu Da Xiao.

Diagram 1: Main Menu

Step 2: After selection, the user would be able to view Liu Da Xiao's schedule. As reflected below, those that are blocked out in yellow represents a slot already being booked and those that are blocked out with a "-" represents Liu Da Xiao's unavailability. To start booking, click on the box indicated with a star.

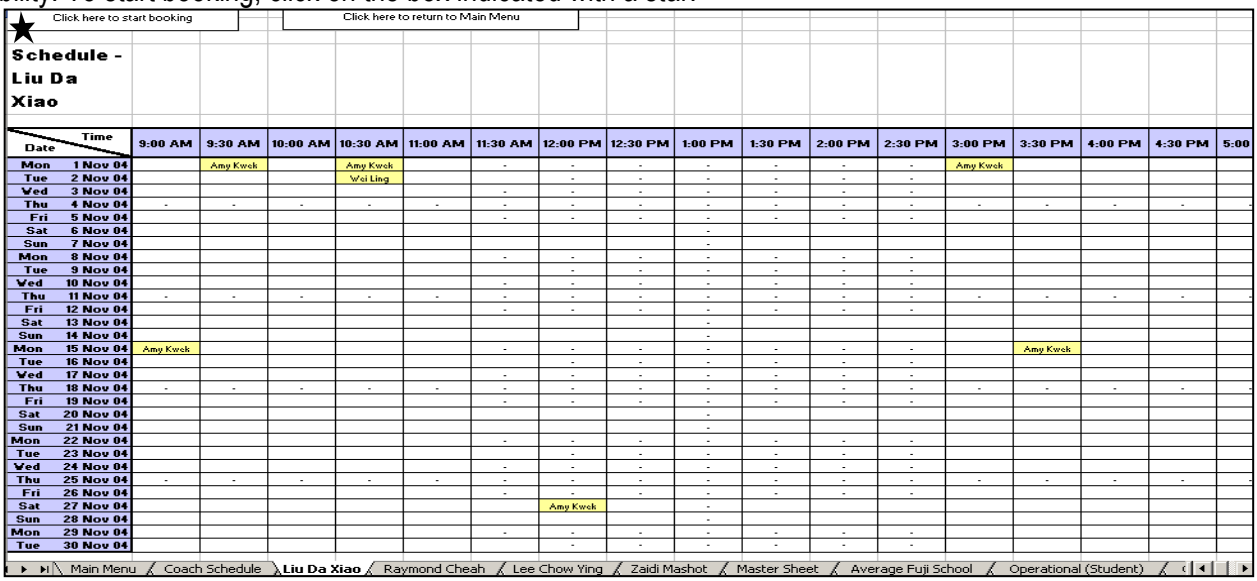


Diagram 2: Individual Coach Schedule

Step 3: The Easy Booking System program would open to allow you to book your lessons. The steps to complete a booking are as follow:

1. Select a day
2. Select available time slots. If a wrong selection is being made, it can be removed.
3. Click “Done” once selection of dates and timings of lessons is completed.
4. Click “Ok” to confirm no. of time slot(s)
5. Enter User’s name
6. Finally, click on “Ok” to complete booking.

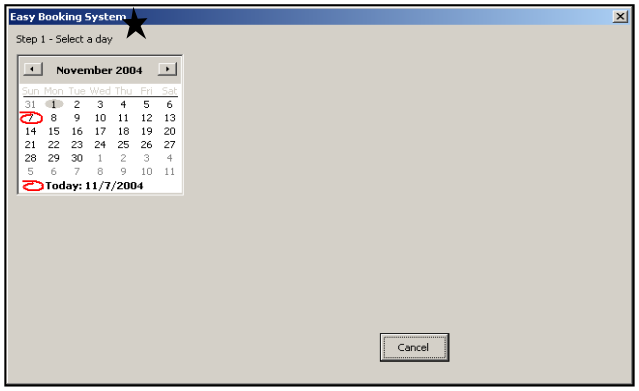


Diagram 3: Step 1

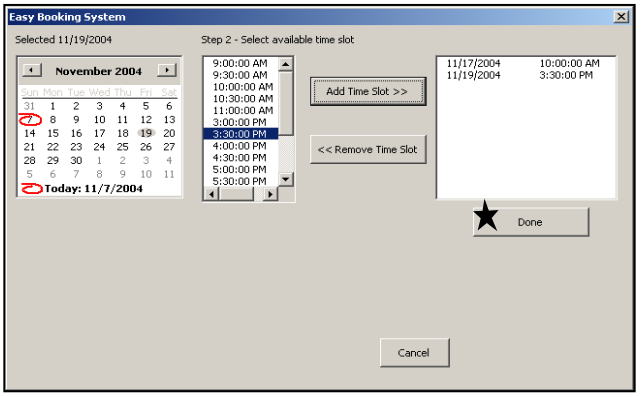


Diagram 4: Step 2 and 3

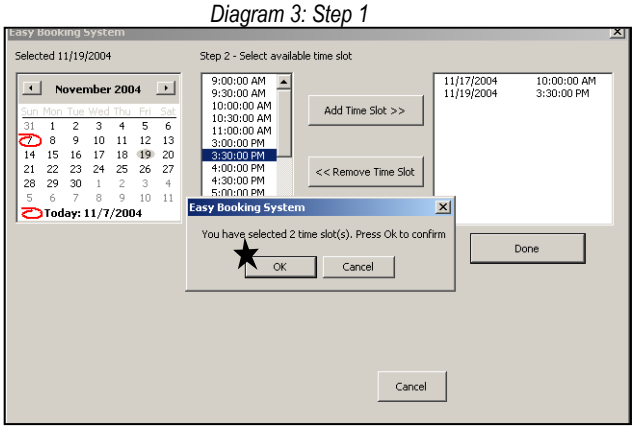


Diagram 5: Step 4

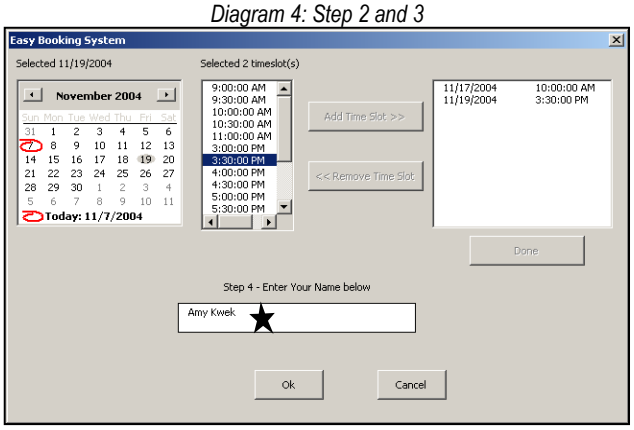


Diagram 6: Step 5

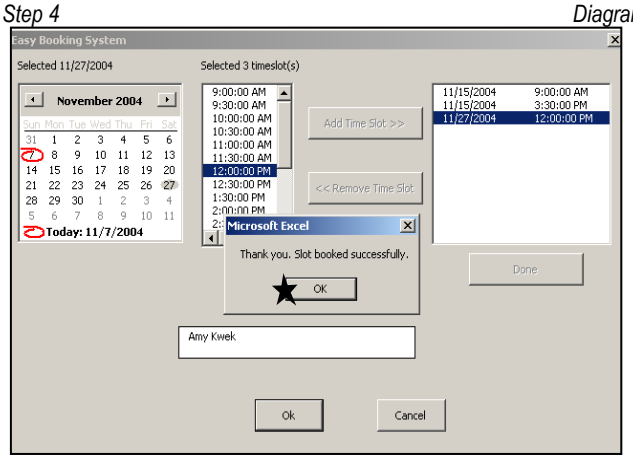
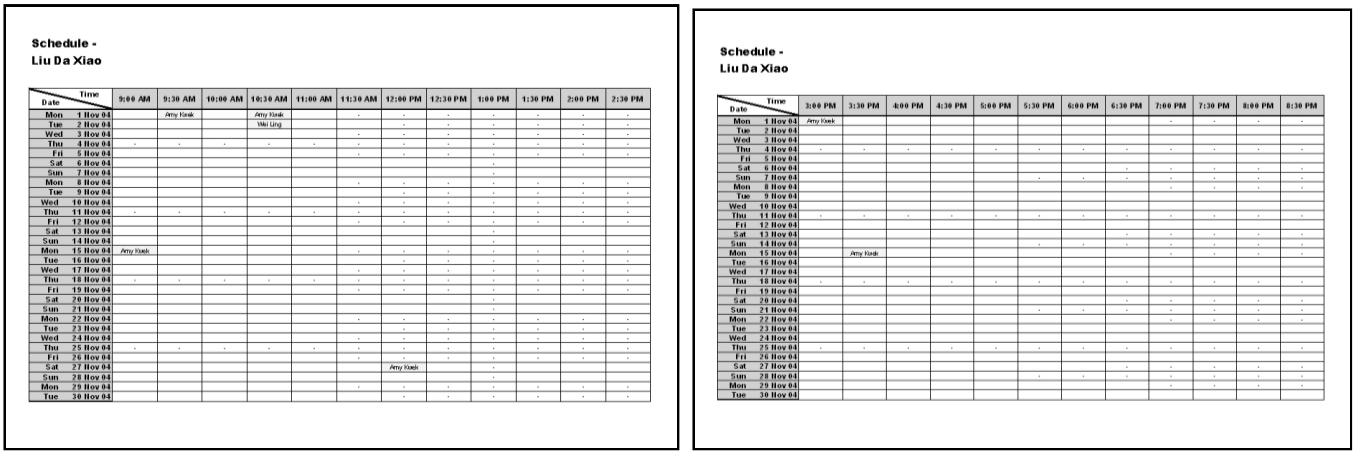


Diagram 7: Step 6

Step 4: Booking would be reflected in the individual coach schedule.

With this system, all coordination of lessons is computerized. There would be no need for any form of data entry on the executive’s part and each individual coach would be able to keep track of their monthly schedule. Monthly records could be printed out a neat 2 page layout.



Schedule -
Liu Da Xiao

Date \ Time	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM
Mon 1 Nov 04		Amy Kwek		Amy Kwek		-	-	-	-	-	-	-
Tue 2 Nov 04				Wei Ling		-	-	-	-	-	-	-
Wed 3 Nov 04						-	-	-	-	-	-	-
Thu 4 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 5 Nov 04						-	-	-	-	-	-	-
Sat 6 Nov 04									-			
Sun 7 Nov 04									-			
Mon 8 Nov 04						-	-	-	-	-	-	-
Tue 9 Nov 04							-	-	-	-	-	-
Wed 10 Nov 04							-	-	-	-	-	-
Thu 11 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 12 Nov 04							-	-	-	-	-	-
Sat 13 Nov 04									-			
Sun 14 Nov 04									-			
Mon 15 Nov 04	Amy Kwek					-	-	-	-	-	-	-
Tue 16 Nov 04							-	-	-	-	-	-
Wed 17 Nov 04							-	-	-	-	-	-
Thu 18 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 19 Nov 04							-	-	-	-	-	-
Sat 20 Nov 04									-			
Sun 21 Nov 04									-			
Mon 22 Nov 04						-	-	-	-	-	-	-
Tue 23 Nov 04							-	-	-	-	-	-
Wed 24 Nov 04							-	-	-	-	-	-
Thu 25 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 26 Nov 04							-	-	-	-	-	-
Sat 27 Nov 04							Amy Kwek		-			
Sun 28 Nov 04									-			
Mon 29 Nov 04						-	-	-	-	-	-	-
Tue 30 Nov 04							-	-	-	-	-	-

Schedule -
Liu Da Xiao

Date \ Time	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM
Mon 1 Nov 04	Amy Kwek								-	-	-	-
Tue 2 Nov 04									-	-	-	-
Wed 3 Nov 04									-	-	-	-
Thu 4 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 5 Nov 04									-	-	-	-
Sat 6 Nov 04									-	-	-	-
Sun 7 Nov 04						-	-	-	-	-	-	-
Mon 8 Nov 04									-	-	-	-
Tue 9 Nov 04												
Wed 10 Nov 04												
Thu 11 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 12 Nov 04									-	-	-	-
Sat 13 Nov 04									-	-	-	-
Sun 14 Nov 04						-	-	-	-	-	-	-
Mon 15 Nov 04		Amy Kwek							-	-	-	-
Tue 16 Nov 04												
Wed 17 Nov 04												
Thu 18 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 19 Nov 04									-	-	-	-
Sat 20 Nov 04									-	-	-	-
Sun 21 Nov 04						-	-	-	-	-	-	-
Mon 22 Nov 04									-	-	-	-
Tue 23 Nov 04												
Wed 24 Nov 04												
Thu 25 Nov 04	-	-	-	-	-	-	-	-	-	-	-	-
Fri 26 Nov 04									-	-	-	-
Sat 27 Nov 04									-	-	-	-
Sun 28 Nov 04						-	-	-	-	-	-	-
Mon 29 Nov 04									-	-	-	-
Tue 30 Nov 04												

Diagram 8: 2 page individual coach schedule

Further more, the executive can keep track off the Skating School's lessons *(all coaches)* on a whole by selecting the date at which she would like to refer to.

Master Sheet - Fuji Ice Skating School

Please Select Date: Mon 1 Nov 04

	Liu Da Xiao	Raymond Cheah	Lee Chow Ying	Zaidi Mashot	Total
9:00 AM	0	0	0	0	0
9:30 AM	1	1	0	0	2
10:00 AM	0	0	0	0	0
10:30 AM	1	0	0	0	1
11:00 AM	0	0	0	0	0
11:30 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0
12:30 PM	0	0	0	0	0
1:00 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
3:00 PM	1	0	0	0	1
3:30 PM	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
6:00 PM	0	0	0	0	0
6:30 PM	0	0	0	0	0
7:00 PM	0	0	0	0	0
7:30 PM	0	0	0	0	0
8:00 PM	0	1	0	0	1
8:30 PM	0	0	0	0	0

Diagram 9: Master Sheet – Fuji Ice Skating School

Another feature implemented was the average no. of students from the Fuji Ice Skating School. This sheet would be linked up to the Operational Sheets - Weekend, Weekday, and Student Promotion *(mentioned above in the Primary Objective – Model Formulation and Functions used)* so as to estimate the total human traffic in the ice skating rink at any time.[5]

Functions Used

In this model, the main functions which we widely made use of were the IF function along with logical functions, INDEX as well as MATCH. In order for the timings during which the coaches are available to be reflected on their individual coaching schedules, we first have to MATCH the date in their individual coaching schedules to the day on the "Coach Schedule" worksheet and also the respective timings. To change the date into a day so that the MATCH function will work, we made use of the WEEKDAY function. This is then proceeded with an IF function which states that when the coach is available, the cell would appear blank while when the coach is unavailable, a "-" would be shown instead to represent that the coach is not available for booking. The INDEX function used in the IF function is to help recognize the various timings in the "Coach Schedule" worksheet and to match it with the individual coach schedule.

In addition, we also use the hyperlink function to link the coaches in the main menu to their individual schedule or back.

In the master sheet, the IF function was used to translate "-"or blanks in the individual coach schedule to represent a zero attendance. The INDEX and MATCH function used in the IF function was to recognize timings in the individual coach schedule and allowing the attendance to be displayed in the master sheet. If there is no "-" or blanks, a "1" would be

[5] Refer to Appendix 5

registered. Whereas for the average no. of student in Fuji Ice Skating School sheet, the SUMIF function was used to sum the corresponding cells if the day is being matched. After which the AVERAGE is taken over all the individual coach's lessons.

Problems Encountered

Due to the complexity of the various functions we used in our model as all our worksheets are interlinked together, we encountered several problems in the process. Firstly, because we were unfamiliar with some of functions that we used but are not taught in class, we have to do several trial and errors to experiment on the workability of these functions the way we wanted to use them for. Especially when we need to come out with lengthy function like the one used in the individual schedules of the various coaches[6], we had to clearly state in what way we want the functions we used to work together.

Secondly, while working out on the model, we realized that the way we arranged our tables would affect the functions we could use. An example would be our individual coach schedule and master sheet[7]. We have arranged our timings in the master sheet vertically whereas in the coach schedule, it was arranged horizontally. This poses a problem when we drag and copy the formulae. As a result, considerable planning on how our model must work will be needed before we could start on our project.

Lessons Learnt

We are very glad that we got to interact with the staff from Fuji Ice Palace to understand the main problem they were facing. Initially, our aim was to minimize their cost and hence maximize their revenue in the earlier proposal. After interacting with the staff and through observation, we felt they were not concerned in minimizing their cost at the moment and there were other problems that the company was more interested in solving, so we thought we should explore a real problem rather than the one we have made up earlier. After completing this project, we are amazed by how useful excel is to solve a real world problem. Nevertheless, we had come up with a few models that didn't work earlier. Through analyzing where we have gone wrong and cracking our brains hard, we have finally came up with this final model. We certainly felt an immense sense of satisfaction when this model worked.

Conclusion

The ice skating rink at Leisure World (Kallang), which was their only rival, has since closed down a month ago. Interestingly, this happened when we embarked on this project. Hence, according to the staff, there has been a significant increase in the crowd. The company is currently thinking of improving its facilities to cater to a larger group of skaters. The marketing executive has expressed keen interest in acquisition of the proposal. The proposal can not only reflect their actual needs but also at the same time facilitate their lessons. It's time saving as well as increases efficiency. In a nutshell, our project has achieved the aim we set out with and hence we deemed it a successful plan.

Log Details

Staff Contacts:

1. Celia Lim, Marketing Executive. HP: 90883253
2. S.K.Tan, Executive Director HP: 96382323
3. Henry, Operations Manager (On site Interview)

Data Sources:

1. Front Desk Management Team
2. Website: http://www.fujiice.com.sg
3. Surveys conducted on 23rd Oct and 24th Oct 2004
4. On site observations on 11th, 15th, 23rd, 24th and 25th Oct 2004

Done By: Amy Kwek En-hui
Ang Wei Ling
Lee Yan Wei
Lim Ying Le Evangeline

[6] Refer to Appendix 6
[7] Refer to Appendix 7

Appendixes

Appendix 1

Time	10-12pm	12-4pm	4-8pm
% of crowd	10%	65%	25%
no. of time slots	12	24	30

	average	min	max	random simulation
Total	450	400	500	**454**
10-12pm	45	40	50	**40**
12-4pm	293	260	325	**287**
4-8pm	113	100	125	**127**

The percentages of crowd multiply by the total no. of people per day to derive average no. of people. Extrapolate to derive minimum and maximum.

Appendix 2

Probability Table

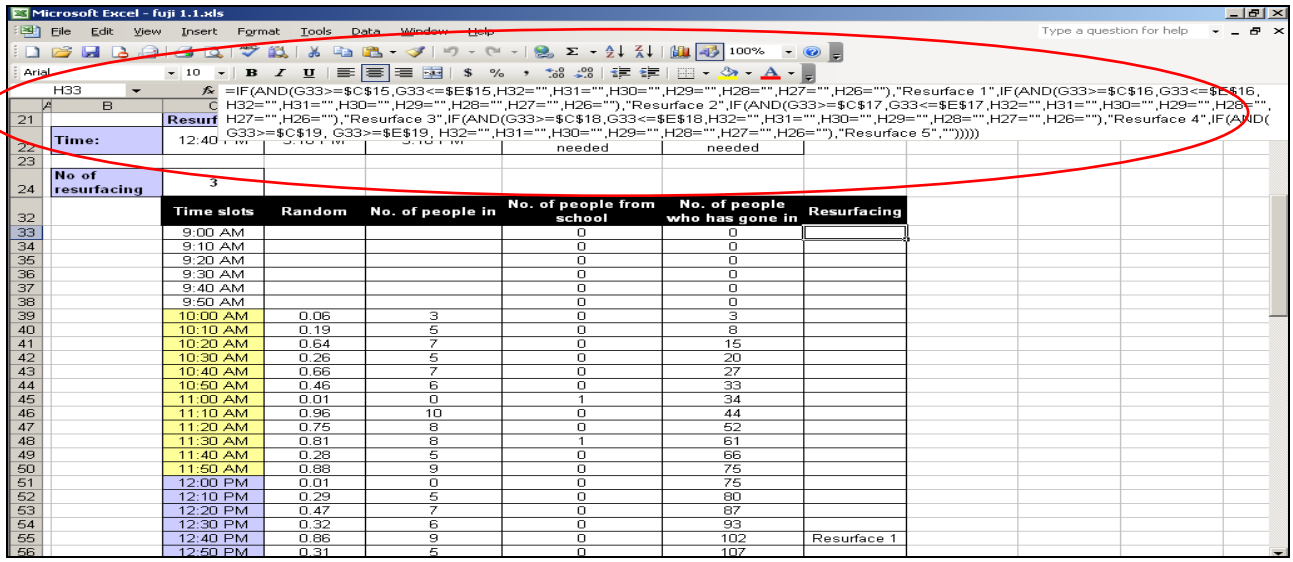
10-12pm			12-4pm			4-8pm		
cumulative prob	no of pple	% of occurrence	cumulative prob	no of pple	% of occurrence	cumulative prob	no of pple	% of occurrence
0	0	5%	0	0	0%	0	0	2%
5%	1	7%	0.0%	1	0%	2%	1	2%
12%	2	9%	0%	2	0.5%	4%	2	3%
21%	3	22%	1%	3	0.5%	7%	3	22%
43%	4	29%	1%	4	0.5%	29%	4	28%
72%	5	18%	2%	5	0.5%	57%	5	18%
90%	6	2%	2%	6	1%	75%	6	12%
92%	7	2%	3%	7	1%	87%	7	4%
94%	8	1%	4%	8	1%	91%	8	4%
95%	9	1%	5%	9	1%	95%	9	1%
96%	10	1%	6%	10	2%	96%	10	1%
97%	11	1%	8%	11	8%	97%	11	1%
98%	12	1%	16%	12	34%	98%	12	1%
99%	13	1%	50%	13	50%	99%	13	1%

Probability table of the human traffic entering every 10 minutes at different times of the day

Appendix 3

Time slots	Random	No. of people in	No. of people from school	No. of people who has gone in	Resurfacing
9:00 AM			0	0	
9:10 AM			0	0	
9:20 AM			0	0	
9:30 AM			0	0	
9:40 AM			0	0	
9:50 AM			0	0	
10:00 AM	0.65	7	0	7	
10:10 AM	0.41	6	0	13	
10:20 AM	0.31	6	0	19	
10:30 AM	0.74	8	0	27	
10:40 AM	0.47	6	0	33	
10:50 AM	0.70	8	0	41	
11:00 AM	0.47	6	1	48	
11:10 AM	0.42	6	0	54	
11:20 AM	0.01	1	0	55	
11:30 AM	0.11	4	1	60	
11:40 AM	0.54	7	0	67	
11:50 AM	0.15	4	0	71	
12:00 PM	0.40	6	0	77	
12:10 PM	0.10	3	0	80	
12:20 PM	0.10	3	0	83	
12:30 PM	0.52	7	0	90	
12:40 PM	0.67	8	0	98	Resurface 1
12:50 PM	0.69	8	0	106	
1:00 PM	0.75	8	1	115	
1:10 PM	0.59	7	0	122	

Appendix 4



Time slots	Random	No. of people in	No. of people from school	No. of people who has gone in	Resurfacing
9:00 AM			0	0	
9:10 AM			0	0	
9:20 AM			0	0	
9:30 AM			0	0	
9:40 AM			0	0	
9:50 AM			0	0	
10:00 AM	0.06	3	0	3	
10:10 AM	0.19	5	0	8	
10:20 AM	0.64	7	0	15	
10:30 AM	0.26	5	0	20	
10:40 AM	0.66	7	0	27	
10:50 AM	0.46	6	0	33	
11:00 AM	0.01	0	1	34	
11:10 AM	0.96	10	0	44	
11:20 AM	0.75	8	0	52	
11:30 AM	0.81	8	1	61	
11:40 AM	0.28	5	0	66	
11:50 AM	0.88	9	0	75	
12:00 PM	0.01	0	0	75	
12:10 PM	0.29	5	0	80	
12:20 PM	0.47	7	0	87	
12:30 PM	0.32	6	0	93	
12:40 PM	0.86	9	0	102	Resurface 1
12:50 PM	0.31	5	0	107	

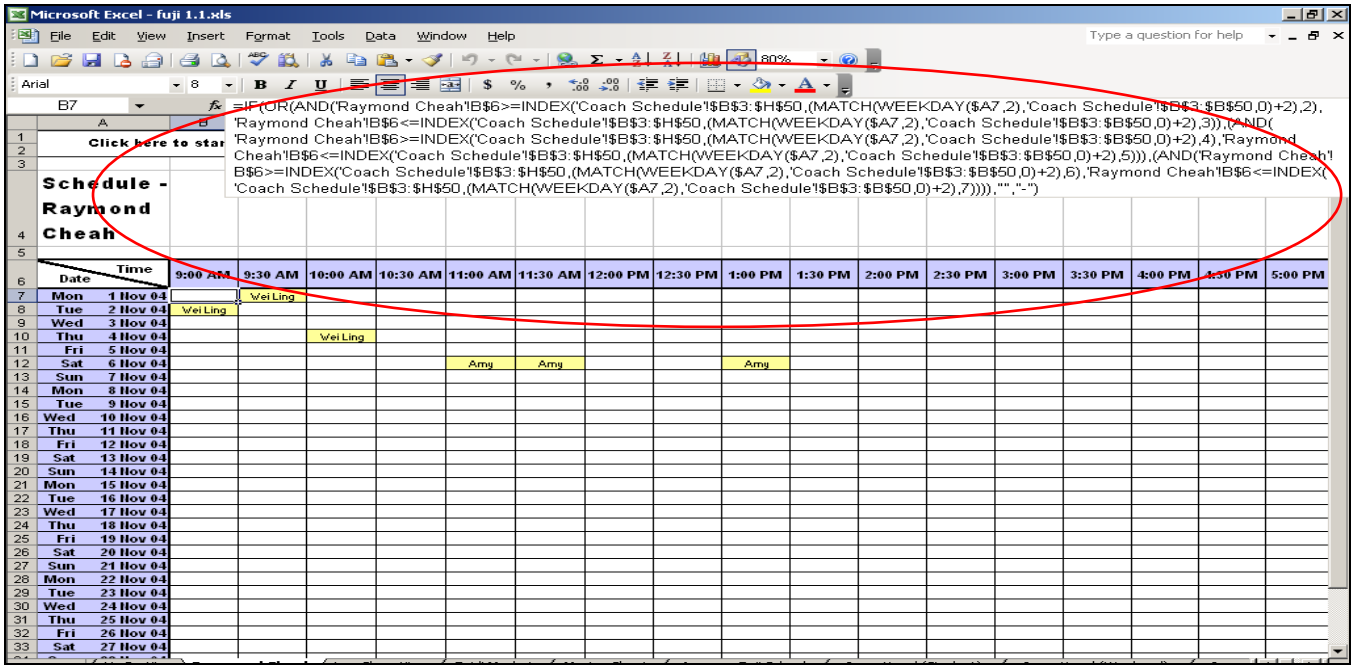
Appendix 5

Fuji Ice Skating School - Average Attendance

Time / Date	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM
Weekday											
Monday	1	2	0	1	0	0	0	0	0	0	0
Tuesday	1	0	0	1	0	0	0	0	0	0	0
Thursday	0	0	1	0	0	1	0	0	0	0	0
Friday	0	0	0	0	0	0	0	0	0	0	0
Average	1	1	0	1	0	0	0	0	0	0	0
Weekend											
Saturday	0	1	0	0	0	1	1	1	0	0	0
Sunday	1	0	0	0	0	0	0	0	0	0	0
Average	1	1	0	0	0	1	1	1	0	0	0
Student											
Wednesday	1	1	1	1	1	2	2	0	1	1	2
Average	1	1	1	1	1	2	2	0	1	1	2

Average Attendance per day of all the Individual Coaches

Appendix 6



Appendix 7

	Liu Da Xiao	Raymond Cheah
9:00 AM	0	0
9:30 AM	0	0
10:00 AM	0	0
10:30 AM	0	0
11:00 AM	0	1
11:30 AM	0	1
12:00 PM	0	0
12:30 PM	0	0
1:00 PM	0	1
1:30 PM	0	0
2:00 PM	0	0
2:30 PM	0	0
3:00 PM	0	0
3:30 PM	0	0
4:00 PM	0	0
4:30 PM	0	0
5:00 PM	0	0
5:30 PM	0	0
6:00 PM	0	0
6:30 PM	0	0
7:00 PM	0	0
7:30 PM	0	0
8:00 PM	0	0
8:30 PM	0	0

Date \ Time	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:
Mon 1 Nov 04		Wei Ling										
Tue 2 Nov 04	Wei Ling											
Wed 3 Nov 04												

Timings on in individual coach booking schedule were formatting horizontally whereas the timings in the master sheet were formatted vertically