

## Introduction on how to start the DSM Excel macro

### Warning

Speed of the partitioning algorithm. The partitioning algorithm was tested using a 600MHZ Pentium III processor. For a 60 tasks DSM, it took around a minute. For a 100tasks DSM it took a little less than 10 minutes. For a 150 tasks DSM it took almost 1 hour.

Introduction on how to start using this DSM Excel macro:

1. Open the Excel file. When you open the Excel file, you will be warned that the file contains macros and asked if you want to open them; say YES.
2. You can either work with an existing DSM (if you have saved your work earlier) or enter a new DSM. You can start performing DSM analysis, once you open the file, if you would like to use the existing DSM.
3. To enter a new DSM: from the DSM pull-down menu, select "Input New DSM". You will be prompted to enter the number of DSM elements. enter a number between 2 and 250 and press "OK". You will be now in the DSM sheet. In the DSM sheet, enter the names of the DSM elements (note that if you do not enter any names, the macro will still work). After entering names, enter number "1" inside the matrix, if a relationship exists between two DSM elements; otherwise, leave "blank".
4. After step (2) you will be able to perform several DSM analysis on the matrix. For example, in order to partition the matrix, go to the DSM pull-down menu and select "Partition DSM". When you do so, you will be shown the partitioned DSM in the "Partitioned DSM" sheet. Note that if you do not perform this step and you manually move to the "Partitioned DSM" sheet, you will not see the (correct) partitioned matrix.
5. Tearing DSM marks: the macro performs two types of tearing: tearing a single DSM mark or tearing all marks in a DSM column. In order to perform either tearing types, the current/active sheet need to be the "Partitioned DSM" sheet. To Tear a single DSM mark, make that mark an active worksheet cell by selecting it. Then, from the DSM pull-down menu, select "Tear DSM Mark". In order to Tear the whole column, place the cursor in any cell in the column you want to tear, then select "Tear DSM Column" from the DSM pull-down menu. Note that you are able to undo tearing a single mark by selecting "Undo Tear Mark" from DSM pull-down menu. BUT, you cannot undo a tear column command.
6. Using the "Banding" macro. After inputting the DSM, you can perform banding on either the unpartitioned DSM or the partitioned one. To band the unpartitioned DSM simply select from the DSM pull-down menu the "Band Unpartitioned DSM" command. You are done. To band the partitioned DSM, you need to partition the DSM first using what is described in step 3, above. After doing so, select the "Band Partitioned DSM" command from the DSM menu.
7. You can add a task to an existing macro, by selecting from the DSM pull-down menu "Add New DSM Elements"! when you click this, a window will appear asking you how many elements/tasks you like to add. After entering the desired number and clicking ok, this will take you (automatically) to the original/initial DSM sheet and let you enter new tasks at the END of the matrix. YOU CAN NOT insert elements in the middle of the matrix, they have to be at the end. Also enter dependencies of these new tasks to the existing (or new) tasks by inserting "1"s in the correct places. Now you can start using the new DSM for analysis.
8. You cannot delete tasks from an existing DSM, at least directly. The only way to do that for now is to make a copy of the original DSM (in a temporary location) and do whatever you like to do it off-line (deleting or adding tasks), then go back to the DSM program and select "Input new problem", then enter the number that corresponds to the new matrix that you have created/edited off-line. Once you see a blank DSM displayed with the correct number of tasks, go copy and paste the off-line DSM in

the correct position/location in the DSM macro file. It is ok to overwrite some of the cells as long as you keep the same location for the task names and numbers. Be careful when doing this pasting procedure that the copied material falls in the correct location!

9. Entering data to run the simulation: please read the tutorial section on DSM simulation before you start using the macro. In order to simulate the DSM, you do not have to run the "partitioning" algorithm first. BUT, you need to make sure that the "Data Analysis" Add-In in Excel is turned on. In order to check for this, select the "Tools" pull down menu in Excel and see if you can find the sub-menu item ""Data Analysis". If you can, then you are O.K.. If you cannot, then you should turn it on by selecting "Add-Ins" from the "Tools" menu. When prompted with a new window, select "Analysis ToolPak". If it is already selected, then unselect it and click ok. Repeat the process for selecting the "Analysis ToolPak" option. Finally, you need to input more data to describe the original DSM that you initially built.

First, you are required to enter a three point duration estimate for each task. You will be prompted to do so, once you click on the "Simulation" icon or select "Simulate DSM" from the pull down menu.

Second, each mark in the original DSM is replaced by two numbers: a "rework probability" number and an "impact" number. This replacement process starts once you have clicked "done" in the previous step. You will be automatically prompted to enter the probabilities of rework in all the blue colored cells of the DSM. Once finished, you should click on the "Accept" button at the top of that sheet. This will start the sheet where you need to enter "impacts" in the blue cells of the DSM.. Once the simulation ends, it will automatically display a completion time distribution (i.e. Histogram) using a sample size on 100 points. Note that if you need to use a larger sample size, you should specify that in the "SIM Input" sheet while entering task durations and before running the simulation (the default value is set to 100).