

US Paralympic Scheduling

Documentation and Project Summary

Will Prather

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Executive Summary

US Paralympics is part of a larger world organization that hosts Olympic Games for paraplegic individuals. After the traditional Olympic Games each two years, the Paralympic Games are held. The US team is assisted by the US Paralympic organization. The organization has a goal of helping individuals with physical challenges and getting funding to be able to do that.

In order to get the funding they need, they make an annual trip to visit with elected officials in Washington DC. This event requires significant coordination of schedules of potentially hundreds of participants. The system that was developed contains two parts that limit data entry to three tables, which are used because it creates a dynamic environment of which VBA can take advantage. The system can then automatically generate master schedules for each day of the event. The second part of the system generates individual itineraries in Word for distribution to the participants. Word was chosen because there may be a need to input additional information into a participant itinerary.

Introduction

The US Paralympics is a fantastic organization. Each year, administrators and athletes meet with Congressmen and Congresswomen to discuss the importance of the paralympic program. In an effort to schedule these organize these appointments, administrators use a simple spreadsheet. They have relied on assistants to manually enter the information into the spreadsheet and then update the spreadsheet as needed in numerous places for every change that occurs. What would have taken hours upon hours into the early hours of the morning, can now be done in the matter of a few minutes. The following document discusses a scheduling spreadsheet, which relies heavily on VBA to function, that allows for data entry in a single area. The technical information precedes the educational value that this project held.

Organization

The following is an outline of the important elements in the new spreadsheet.

1. Scheduling (Workbook)
 - a. Participants (Worksheet)
 - i. Table 1 - Contains the names of all athletes and administrators attending appointments.
 - ii. Table 2 - Contains times at which appointments will start.
 - b. Assignments (Worksheet)
 - i. Appointment_List (Table) - Contains all appointments for the duration of the event.
 - ii. Generate Master - Creates a master schedule in the form of a new spreadsheet, one per day.
 - iii. Generate Itinerary - Creates a single Word document with an individualized itinerary for each participant in Table 1.
 - c. Master (Module) - Organization indicates which methods invoke other methods
 - i. Sub Generate_Master - Creates a new worksheet for each different date in the Appointment_List table
 1. Sub Format_Sheet - Creates the formatting on a blank sheet
 2. Sub Add_Appointments - Creates appointments in appropriate rows and columns for each individual
 - a. Function Generate_String - Creates a string that represents the appointment based on participants attending the same appointment
 - b. Function Generate_String_All - Creates a string that represents the appointment given that all participants are expected to attend
 3. Sub Name_Sheet - Names the new worksheet according to the date in the Appointment_List table
 - d. Template2 (Module)
 - i. Sub generate_Itinerary
 1. Sub Individual_Itinerary
 2. Function duplicate

Implementation

Worksheet Functionality

Table 1 was created as a data entry point. It collects the first and last names of the athletes and administrators, henceforth referred to as participants. The full name column is populated by concatenating the first and last name columns. It is used to create the data validation for the drop down lists in the Appointment_List table. The master schedule also draws from this list to create the columns for each participant.

Table 2 is another data entry point. It simply allows the user to define the times that will appear along the side of the master schedule and also in data validation for the starting and end times in the Appointment_List table.

The central table of the new spreadsheet is the Appointment_List table. Here details of each appointment are placed into a table. The columns are Date, Start Time, End Time, Location, Official, Vert. Align, and Attendees one through ten. The official column simply has the name of the elected official being visited. The vert. align column simply specifies whether the appointment should be listed in the master schedule with text at a 90 degree angle or not. Start and End times for each appointment are provided by a dropdown which pulls from Table 2 on the Participants worksheet. Attendees one through ten are populated by selecting from the dropdown list that pulls from the full name column of Table 1.


The purpose to using tables is that the spreadsheet becomes dynamic in a simple way. VBA code can simply refer to the full name column of Table 1 and retrieve however many names are there, be it one or one thousand. Tables also will extend current data validation and formulas to the new rows of data following the pattern of the existing rows.

The Generate Master button runs the first part of the automated features of the spreadsheet. Prior to using this, the user will have entered all relevant information into the three tables. The generate master sub function is called which calls a series of other sub functions and functions which work together to create a new worksheet for each different date in the Appointment_List table. Figure 1 is a partial of the new master schedule that was generated.

	Biz, Harp	Bosser, Nick	Boyle, Sherry	Butler, Barbara	Dinger, Heimer	Drew, Nancy	Frankl, Viktor	Gould, Bill
7:00 AM								
7:15 AM								
7:30 AM								
7:45 AM								
8:00 AM								
8:15 AM								
8:30 AM								
8:45 AM								
9:00 AM								
9:15 AM								
9:30 AM								
9:45 AM								
10:00 AM								
10:15 AM								
10:30 AM								
10:45 AM		10:45 AM Pelosi (Butler, Bosser, Gould, Wilson, Drew) 234 Tanner		10:45 AM Pelosi (Butler, Bosser, Gould, Wilson, Drew) 234 Tanner		10:45 AM Pelosi (Butler, Bosser, Gould, Wilson, Drew) 234 Tanner		10:45 AM Pelosi (Butler, Bosser, Gould, Wilson, Drew) 234 Tanner
11:00 AM								
11:15 AM								
11:30 AM								
11:45 AM								

Figure 1

The Generate Itinerary button creates a Word document with a page for each participant. On each page is a list of the individual events for that participant as well as all events to which all participants should attend. Figure 2 is an example of the output.



UNITED STATES
OLYMPIC COMMITTEE
1 Olympic Plaza
Colorado Springs, CO 80909

Biz, Harp
US Paralympic Congress Visit
Washington DC
March 11 - March 13, 2011

Monday, November 21, 2011

02:30 PM - 04:15 PM	Green
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Tuesday, November 22, 2011

06:00 PM - 07:45 PM	Blue
08:45 AM - 09:45 AM	Red




Figure 2

VBA Functionality

Master Module

The generate master sub procedure calls several other sub procedures which will create the output as seen in Figure 1. Generate_Master first deletes all other sheets other than the Participants and Assignments worksheets. After doing this, the programming enters a for loop which goes for as many rows as there are in the Appointment_List table. An if statement checks to see if a sheet has already been created for a particular date. If it has not, it creates a new worksheet. It then calls the format_sheet which uses for loops to populate the names and times along the top row and left-most column. respectively.

Next, Add_Appointments is called by generate_master. This function reads across the attendees' columns and generates a string, generate_string or generate_string_all methods, of the participants in attendance as well as the details of the appointment. It then adds this strings as the value to the corresponding time for the correct individuals on the master schedule. The difference between the two string creations is simply that one is meant for ten attendee or less, while the other is for all participants.

Finally, this new sheet is given a name. This is done by the Name_sheet sub procedure. It gives a name like, "11-27-2011 Master." The date portion is based upon the date found in the Appointment_List table.

Itinerary Module

The generate_itinerary sub procedure begins the process of generating itineraries for each participant. It first opens Letterhead.docx which must be located in the same directory as the spreadsheet. After opening the file, several input boxes prompt the user for input of title, location, and date range of the event. After this, a for loop that iterates through the full list of participants in Table 1 is run. It calls the Individual_Itinerary sub procedure. After this, it performs just a few touch up formatting changes to the document.

Individual_Itinerary contains much of the code for actually getting the data from the spreadsheet into the Word document. First, an array is created that only contains unique dates from the Appointment_List table. The duplicate function is used to simply identify any date that has already been put into the array. The end result is that the array contains only unique values. Next, text is written into the document starting with the generic information on the top. Following this, appointments are listed by day. Each page is a different individual.

Educational Value

This particular project was accepted before I had much knowledge of VBA. At the time, I knew it could be done, but I couldn't even dim a variable because I didn't know the syntax. Upon learning basic variables, the going got easier as I had already had programming experience. The use of conditional logic and loops was already understood.

The initial project was simply a way that event planners would no longer have to update six different cells when one person's schedule got changed. I was able to deliver that portion of the project to my client in February, but it was at that time that the project grew quite a bit. I was then asked to develop individual schedules, not in Excel, but in Word. I accepted and was ultimately able to finish the project as defined by the client.

There were probably two large lessons learned throughout the project. First, a non-technical learning was to have first-hand experience with scope creep. It is very easy to hear, "Could it do this? That would be great!" It is then very easy to say, "Of course, I'll be happy to add that in." Ultimately, my initial assessment of the project and my lack of requirements gathering are to blame. The second lesson learned was more technical. I had learned to use VBA within Excel throughout the project and semester class, but it was actually controlling Word through Excel VBA that was challenging. I had to delve into Word VBA, understand its unique syntax and methods, and then implement it using the combination of Excel and Word VBA.

Conclusion

This project was a great learning experience. In the end, this project could have been done a number of different ways, but none would have provided me the learning within VBA as much as this has. The finished product can actually be used by the US Paralympics for their annual visit to Washington DC, but also for whatever other conferences they hold. It was programmed to be adaptable to the other events they run. It will cut down the number of hours of tedious schedule changes that had previously been experienced.