Event Manager Web Application

Rodrigo Javier Rivera Ruiz
Master of Engineering in Computer Engineering
Advisor: Nelliud Torres, DBA
Electrical and Computer Engineering & Computer Science Department
Polytechnic University of Puerto Rico

Abstract — *Events can bring a lot of benefits the many people. Events can be used to strengthen the community, build trust, generate revenue, raise money, showcase your venue, build brand recognition, recruitment, collect data, form strategic relationships, or just to simply have fun. When creating an event, you need to plan, organize and execute every event perfectly to bring about satisfaction for its attendees and having to do all these tasks can be demanding. This is where an event management application can be used to simplify all the work. The idea is to create an event manager that will help in planning and tracking multiple events that can happen throughout the year, as well as all the activities that can happen inside each event. The benefits of using this event manager is to effectively manage multiple events, develop the events page and track the registrations, give organization to the users, and learn about the final results of the event.*

*   **Key Terms** — *Admin Manager, Event Public Portal, Events, Web Application.*

INTRODUCTION

Planning, organizing and executing events is something that will always be needed when creating events. This is where the idea of creating an event manager comes in. Having to do all the work manually for creating an event can take a lot of time, frustrations and a lot of problems and errors. Using an event manager application can organize your team, reduce the workload, reduce the costs, create an online registration experience, boost your ticket sales with better event marketing tools, manage your attendees, maximize attendee engagement, automate onsite check-in, analyze the success of the event, manage multiple events simultaneously, and perhaps duplicate the success of past events or improve on those past events. The main idea was for this application was to create a user friendly application that can be accessed from anywhere by anyone. This is the reason for making it a web application because it can be reached by anyone in the world at any time. When making an event management application using with a ticketing experience, there has to be an admin portal where the admin users can login and create their own events, customize them and make the m available for registering. There also needs to be a public portal where the users can actually look for the available events and register for any event. The security should also be part of the main design because this type of application will hold some sensible data of various users in the database. The users will also be sending and receiving sensible information. This means that careful though needs to be taken, and to follow the internet security protocols to ensure that potential attackers won't be able to do any harm. There should always be a balance between making the application usable and making the application secured, so that the potential users will actually want to use the application. A database was also needed to be created as part of this application to be able to store data of the events and of the users. The following sections will show how the application works, and how it was design keeping in mind the security and usability, and have an end product that will help users achieve their goals when creating customizable events using this event manager application.

AN EVENT MANAGER WEB APPLICATION

To design an event manager that will be used by users to create events, the application needed to be flexible and not limited to a single type of event. The design used is that there can exist one global event that can last one whole day, or even multiple days. This event can also hold multiple activities that can happen throughout the day at different hours. In this application exists two types of users, the

administration users that have access to the administration portal where they are able to login using their account credentials and will be able to create customizable events and activities that will occur in the event. The administration users can also edit existing events and activities and see all the users that have registered to each event and activity. This web application also contains a public event portal where the users or attendees can look for existing events, and information about those events. They can also create an account and register to any event that they want. Confirmation emails will be sent to each registered account and registered event. When the users register to an event a confirmation code will be sent via email. The user will need this confirmation code to be able to enter to the registered event. On the day of the event the administration user that created the event will access a page where he will check-in each attendee. To check-in an attendee, the person will need to give his confirmation code and once it is used, it can't be used for a second time to enter the event. This way the administration user will have confidence that an unauthorized person attends the event. After the event has finished the administration user can access an admin page where he can see how many people registered to the event and how many of those registered actually attended the event. This can be a very useful information for the administration user.

Database Specifications

The first design that created for this event manager application was the database. The database server that was used in this application was the Microsoft SQL Server. The database had to be designed in a way that the application could be used to create any type of event, customizable to the user's needs. This was important, so it was decided that there would be an event table that has the basic information about the event like the Name, Description, Starting Date and Hour, Ending Date and Hour, the Country, City, Location and Category. The other important table that was created was the Activities table that will store all the different activities that will be happening during the event.

This way we can create any type of event without any limitation. The activities table consists of informative columns like the Name of the activity, the Description, the Date Start and Hour and End Date and Hour. It also consists of an EventID column that specifies to which event the activity corresponds to.

An administration user table was created to store all the admin users that will login to the administration mode application. This table stores the login credentials for the admin user as well as the role, or type of admin user that the user is. Depending on the role that the admin user has, he can will have authorization to access certain admin pages and won't be able to access other pages. For the admin application security, a Role and Permission tables were created so that we can limit the authorization to specific pages. This way we can have multiple levels of authorization for each user, and the main user administrator can use other admin users that will help him with specific areas of the event, like the creation, planning, registration, and analysis. The main administrator will be able to transfer each responsibility to different admin users that he chooses. Another critical design choice was to have a table that ties the Administration User table and the Events table so that the admin users that login to the admin app will only be able to see information about the events that he is supposed to have access to. This way no admin user will be able to see any type of information about other events and no one will be able to see information about his own event.

The Attendee table was also created to store the information about the users that have registered in the Public Portal Event application. This table holds the login credentials for the users, as well as Registered Date, Verified Account, Name, Date of Birth, Phone and Address columns. This information can be used to verify that the person that is trying to access the event is actually the same person that was registered to the event. To relate the attendee that has registered to an event, a table was created that relates the Attendee table to the Activities table, and it is named AttendeeActivities. This table was created so

that we can easily see which attendees are participants of which Event and Activity.

Figure 1
Database Design

Figure 1 shows the final database design used for the Event Manager Application. It specifies all the columns for each table and how each table is related to another table.

Web Application Specifications and Development Environment

The web application was developed using Microsoft Visual Studio 2017 IDE. The framework used is the .NET framework 4.5, which is a programming language created by Microsoft that developers can use to create application more easily [1]. The other framework used is the ASP.NET MVC which is a web application framework also developed by Microsoft, which implements the model-view-controller (MVC) pattern [2]. Also the Entity Framework which is another Microsoft framework which is a set of technologies in ADO.NET that support the development of data-oriented software applications. And the approach used in the Entity Framework was the database-first approach where the Entity Data Model is created from an underlying database [3]. For the the client to give some styling to the HTML, the Bootstrap 3 CSS library was used, which is very useful since it helps you create better looking web sites and is less time consuming. To complement the Bootstrap library,

the jQuery library was also used, which is a JavaScript library that simplifies a lot of functions. This library gives you great features like a datetime picker where the user can select a date and time from a popup calendar, and data validations for the textboxes and dropdown lists. The data validations help the user to know if the inserted data is in correct format and if it's a field required by the application.

Administrative Portal

A crucial part of the event manager is to have an administrative portal where the admin users can create their events with their own specifications. The security was one of the most important aspects of this portal. A session based authentication was used for the web clients. Reference [4] shows that in a session based authentication most of the work is done server side, and the client authenticates with its credentials and receives a session id that is stored in a cookie and attaches this to every subsequent outgoing request. In this application the admin users first lands in the login page where he is prompted to insert his login credentials and send them to the server, the server then authenticates the user's credentials and permissions to the admin pages and redirects the admin user to the home or landing page. The session will remain active while the user navigates each admin page. Whenever the admin user goes to a new page, the server validates if the user has permissions or access to the page and lets him in, if the admin user doesn't have permissions to a certain page, then he won't be able to access it.

The process of creating an event is easy and straightforward. The admin user (after a successfully login) will go to the Events page using the left side menu. On the main event page, the admin user can view all the existing events that he has created. To create a new event, the user will click on the Create button, located in the upper right corner of the page. This will redirect him to the Create Event page where he can fill all the inputs required by the application. After filling all the necessary information, he can click on the Create button and save the new event, or he can cancel it by clicking the cancel button. After creating the event, he will be

redirected to the events main page where he can see that his event was added to the events table. In that table, the user can click on the edit button if he wants to edit the information about the created event.

Figure 2
Events Main Page

After creating the event, the user needs to create at least one activity for that event. He will click on the Activities button in the left side menu. This will redirect the user to the Activities main page where, like the Events page, he will see all the created Activities. To create a new activity, he will click on the Create button and land on the Create page.

Figure 3
Activity Creation Page

On the Activity Creation page, as show in Figure 3, the user will enter all the required information, including selecting the Event from the dropdown that this new activity corresponds to. After entering all the required information, the user will click on the create button and it will be saved. The user can create unlimited activities for the same event.

The admin user can also have to option to go to the Attendees page where he can see all the people that have registered to any of his events and activities. He can view the basic information about he attendee like his email, phone, name and the registered activity. The admin user can also navigate to the Registration page where he can create attendees account by himself. On the day of the event, the admin user will navigate to the Check-in page. This page will be used to register all the people on the entrance of the activity. The admin user will be prompted to select an event, and then the activity that he wishes. This will redirect him to the Check-in Registration page

Figure 4
Check-In Registration Page

In the Check-In Registration page, as shown in Figure 4, the admin user will ask the attendee for the confirmation code. After entering the confirmation code, the information about the user will be displayed, here the admin user can confirm that the attendee is the real person. To complete the check-in for the attendee, the admin user will click on the Check in button and an alert will notify the admin user that the attendee has been successfully check in. For security purposes, two different validations have been implemented in the Check in registration page. If the confirmation code provided by the attendee is invalid, an alert will notify the user admin. The second validation is if the confirmation code has already been used once, an alert will notify the admin user and he won't be able to check in the attendee. Once the event has ended, the user admin can navigate to the Events Summary page. In this page the admin user can view all the events and activities and the final result of the event. There is a table that shows the admin user how many people registered for each event and how many people attended the

event. This can be a very useful information to the admin user to know if the event was a success or if it needs some improvement.

Public Portal

The public portal is the web application where the users that want to attend an event will be using. When the users first access the website, they will be redirected to the home page where all the available events will be displayed. In this page the users can search for a specific event and for events available for a specific city.
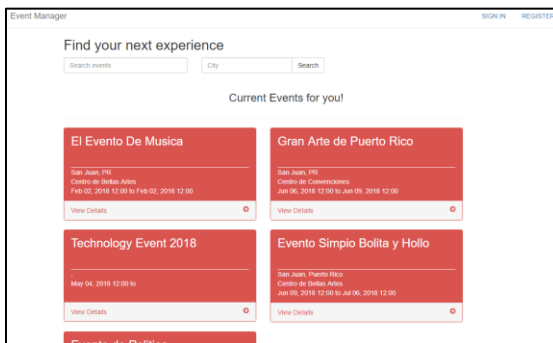

Figure 5
Public Portal Home Page

The public portal also has a navigation on top of the page. The user can navigate to the Registration page or to the Sign in page. If the user doesn't have an existing account, then he will go to the registration page and fill all the required information. After completing the registration form, a confirmation email will be sent to the entered email. The registered user will have to go to the email and click on the link to activate his account. Once activated the user can now click on the Sign in button and be redirected to the Login page. In the login page the user will enter his login credentials and if the server authenticates him, he will be logged on. Once the user is logged in, the top navigation menu will change, and only the account option will appear. In this account option the user will be able to access his profile information where he will be able to see his information and all the events and activities that he has registered in. Here the user will be able to look for his confirmation codes of the activities that he has been registered to.

When the user selects an event from the home page, he is redirected to an Event Description page. In this page the user can see the descriptions of the event like the date, hour, place and the different activities that will be done in the event. If the user is logged in, he will be able to select the activities which he wishes to attend. Once he selects the activities, he can click on the register button Once he click the register button, he will be registered to the activity that he selected and will be redirected to the Event Registration Confirmation page. He will also receive an email notifying him that he has been registered and the confirmation codes of each activity that he registered to.
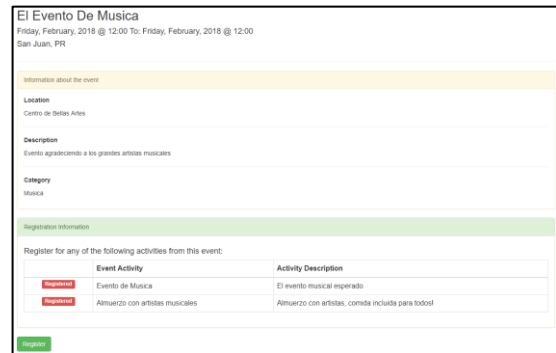

Figure 6
Event Registration Page

The user can now go to the home page and continue searching for other events and register to new events.

CONCLUSION

Creating an event manager web application will help a lot of people create and manage the events easily with the specifications that he prefers. Making these types of applications that have real world uses and that at the same time helps communities to organize events that will unite and strengthen them. With all the benefits that bring these types of applications always pushes for better innovations and can always be improved on. When using this application, one can clearly see how important is the usability. If an application is fun to use and doesn't cause many headaches, the users will gladly use it. So it is always important to keep in mind that

everything can always be improved and that it's a good practice to have normal testing users that will speak their mind so that the developers can improve on their work. Another important aspect highlighted in this project is the importance of security. When creating applications that will be accessed through the internet, there are many more threats that can affect the users or the application itself. One should always keep the security on high importance and never dismiss it. After keeping in mind all these things, a successful Event Manager Web application was created since it complies with the specifications that were were needed. But as everything, it can be improved and be given more functions.

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