"The Local" Web Application

by

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Submitted to
the Faculty of the School of Information Technology
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Technology

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University of Cincinnati
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April 2017

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Acknowledgement

We would like to express our gratitude to the University of Cincinnati Senior Design Class of 2017. Particularly, the teachers who spent hours teaching, revising, reviewing, helping, and commenting on each and every one of our projects and proposals. Without these contributions and the help of the faculty and peers, our project wouldn't be what it is.

Abstract

Finding local events and activities on the go can be extremely tough. People usually have to do extensive research through social media or ticket sale websites to locate local events. To attend these events, they have to plan ahead and make a schedule even though the event locations are only 15 minutes away from them. “The Local” solves the problem by providing a central location for users to find detail information on events in their area. By interacting with Google APIs, this event finder web application is built to provide our users with a centralized location for the users to discover local activities to participate in. The users have the ability to receive directions to the nearby events using integration into their smartphones. The users also receive customized suggestions based on their personal interests and can give rating and reviews for each event. Local event hosts can add their event to the website and make it available to the public.

Introduction

According to Cincinnati.com, this metropolitan area is the fastest growing city in the Midwest region. With the population growth of 0.4 percent, which is equivalent to 21,000 people (data from 2015), Cincinnati is booming with new, creative artists and small businesses. These artists generate thousands of events every year. However, these events are generally, not advertised due to the low budget of the hosts, which lead them to become neglected and forgotten. The primary form of advertisement for small businesses and local artists is social media. Social media is a free and quick way to host events, but not everyone will always see these events, on their feed. The events can also be hard to plan ahead for with the fast paced addition of new material on social media.

“The Local.” Web Application is being created as an on-the-go search engine for Cincinnatians to quickly find events they will be interested in near their location.

Project Description

This project is based on a responsive real-time web application that will allow users to search for, host, and receive suggestions for events they might be interested in their area. Primarily the application will serve as a tool to help connect users to events they might not have discovered otherwise.

Design Objective

This application should be able to scale to browsers on both desktop and mobile devices responsively. The major goal of this application is to connect people with local events they are interested in. To accomplish this, we will begin by determining the user's personal interests with a questionnaire. Once this has been completed, the user will obtain custom suggestions based on their interests.

Methodology

Our team decided on utilizing Agile Methodology with our project because it allowed us to work through features promptly on time. We divided the application into smaller pieces; each piece stood for a function, and each developer would implement one piece per week. By the end of the week, we will do a merge into the master branch and consider that a release.

The first phase of our project was the Research and Design Phrase. We spent five weeks to research and compared our idea with what is on the market. We also make practical and effective use of the Gantt Chart and use it as a timeline for our project release. The second phase of our project was the Development Phrase. We started off with a basic MVC project and

added content, features, and functionality. Testing will be done before each release, which is scheduled every week.

User Profile

We have determined that two users will be interacting with our application. See Figure 1 and 2 below for details.

1. The first user will be anyone who is constantly looking for nearby activities.
2. The second user will be hosts or venues that would like to promote their business.

User Profile Form 1
Application: Discovering Nearby Activities
Potential Users: End Users
Software and Interface Experience: Users should have experience with social networks and event applications
Experience with Similar Applications: Ticketmaster, Eventbrite, Facebook Events
Task Experience: Understanding of smartphone navigation
The frequency of User: Whenever the user wants to locate a nearby activity which could be daily, monthly, or yearly
Key Interface Design Requirements that the Profile Suggests:

Constant uptime and up to date information Easily accessible Positive user experience

Figure 1. Event Participant User Profile

User Profile Form 2
Application: Advertising local artists
Potential Users: Hosts and Venues
Software and Interface Experience: The user should have experience with event creation and advertisement.
Experience with Similar Applications: MyStar933, Facebook Events, Twitter Events
Task Experience: Technology Literate
The frequency of User: Whenever the user wants to host an activity which could be daily, monthly, or yearly
Key Interface Design Requirements that the Profile Suggests: Constant uptime and up to date information Easily accessible Positive user experience

Figure 2. Event Host User Profile

Use Case Diagram

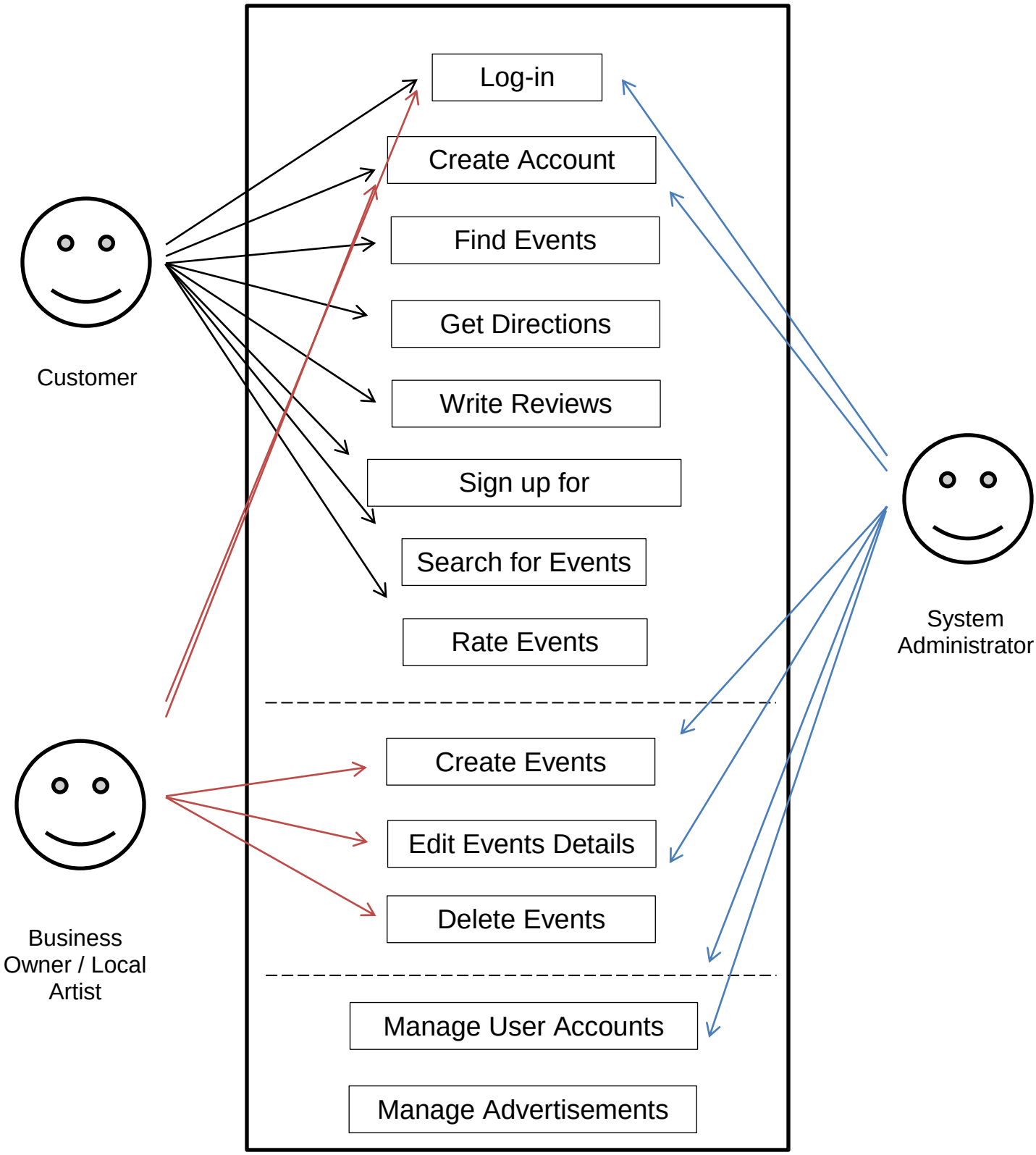

Figure 3. Use Case Diagram

Proposed Budget

We utilize open-source, and university provided tools for the beginning of our project:

- All the developers pre-own a device that they can use to work on. On each device, a licensed version of Microsoft Visual Studio, which is provided by the University, is installed and configured for .NET MVC development.
- The universities Github installation is used to share code and create releases.
- Labor and time allocated to programming and researching are zero dollars. As for labor costs, we are currently not being compensated monetarily by any company to develop this application. However, if we were being paid as entry level full stack developers, and we work at least 18 hours per week at a rate of 15 dollars per hour, the total labor cost will come out to be 3 (number of developers) x 15 (pay rate per hours) x 18 (number of working hours per week) x 16 (number of working weeks) = $12,960.

To go live with our web application and to be able to provide users with the ability to interact with the website, we will need to purchase a host and domain.

- EHost.com charges $2.75 monthly for a hosting service.
- GoDaddy.com charges $4.50 monthly for a domain.

Testing

Original Timeline Estimated

- Database - 11/7/2016
- Store data on events, users, favorites - 11/14/2016
- Connectivity - 11/31/2016
- API connections to obtain data regarding nearby shows - 2/1/2017
- Web Application - Prototype 11/14/2016, Final 3/1/2017
    - Front End:
        - Logo integration
        - Theme implementation
        - Responsive on web and mobile
    - Back End:
        - Favorite feature
        - Notification feature
        - Improve performance by caching
- Mobile Application Potentials (Xamarin) - 3/1/2017
    - iPhone
    - Android
    - Responsive website
    - Map integration
    - GPS location

- Security - 3/1/2017
    - User accounts information security
    - Login password encryption
    - Information of event secured
- Final Testing - 4/7/2016

Gantt chart

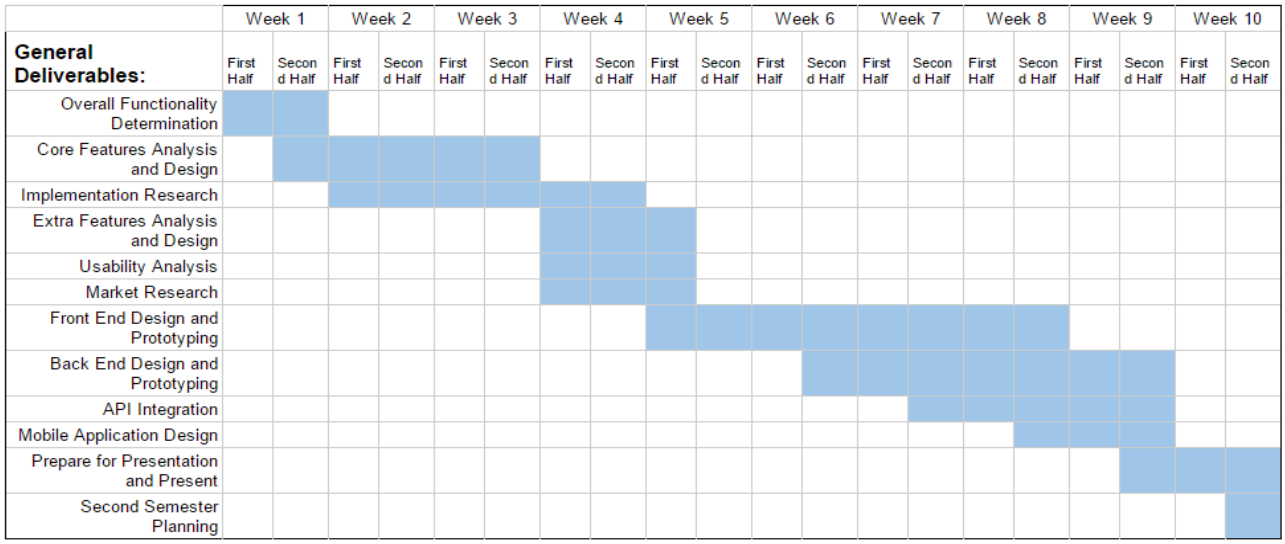

Figure 4. Fall Semester Gantt Chart

	Week 1		Week 2		Week 3		Week 4		Week 5		Week 6		Week 7		Week 8		Week 9		Week 10	
General Deliverables:	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half	First Half	Second Half
Groom the application and contact outside source for design help.																				
Obtain API connection and implement Search function.																				
Finalize on front end design.																				
Implement Review function																				
Implement Favorite function																				
Create testing plan																				
Improve website performance																				
Implement website security																				
Function Testing																				
Create Draft Tech Expo Poster																				
Prepare for Presentation and Present																				
Prepare for the Expo and Present																				

Figure 5. Spring Semester Gantt Chart

Test Plan

Following Agile Methodology, we test our web application every time we schedule a release. After each code merge, we will execute several test plans which will cover testing the basic functions of the application. Before the final presentation, we will recruit some volunteers to test our application.

Functional Requirements:

1. User's role must be recognized during log-in. Certain functions will not be available to all users depending on their roles (Host vs. Discover).
2. Customized events are displayed on the homepage and a map. These events are selected from user's questionnaire answers.
3. Users have the ability to search for events.
4. Users have the ability to give ratings and reviews.

Req. #	Input/Action	Expected Outcome	Actual Outcome	Pass/Fail	Explanation	Date
1	Create a new user and select “Event Participant” as their role.	A new user is created and is prompt for a questionnaire.				
	Create a new user and select “Event Host” as their role.	A new User is created and is redirected to event creation page.				
	Log-in as an “Event Participant” user.	The user is unable to locate the Event Creation Button on the navigation bar.				
	Log-in as an “Event Host” user.	The user is unable to give rating and reviews to events.				
2	Log-in as an “Event Participant” user.	The user is redirected to Home Page. A map is displayed with dropped pin represent events.				
	The user clicks on one of the dropped pins on the map.	Event Detail page is displayed, and the event categories match with user’s questionnaire answer.				

3	The user navigates to the search bar and types in reasonable keywords like “concerts.”	List of events is displayed.				
4	User log-in as “Event Host.”	The uFser is unable to navigate the rating and reviews function.				
	User log-in as “Event Participant.” Navigate to the Event Detail Page and click on rating and reviews	The user is redirected to Rating and Reviews page.				
	The user enters in proper information onto Rating and Reviews page. Click Save button.	The user is redirected to Event Detail Page. Information that user have just entered gets displayed.				

Figure 6. Test Plan

Test Result

1. User 1: Technology savvy, a mid-twenty office worker.

Req. #	Input/Action	Expected Outcome	Actual Outcome	Pass/Fail	Explanation	Date
1	Create a new user and select “Event Participant” as their role.	A new user is created and is prompt for a questionnaire.	New user is created	Pass	User successfully followed workflow of the website.	4/7
	Create a new user and select “Event Host” as their role.	A new User is created and is redirected to event creation page.	User skipped this step because user could not think of a situation that user would need to use this function.	NA	NA	4/7
	Log-in as an “Event Participant” user.	The user is unable to locate the Event Creation Button on the navigation bar.	Event Creation Button was not displayed.	Pass	The user did not have the appropriate authorization to access the button.	4/7
	Log-in as an “Event Host” user.	The user is unable to give rating and reviews to events.	User skipped this step.	NA	NA	4/7
2	Log-in as an “Event Participant” user.	The user is redirected to Home Page. A map is displayed with dropped pin represent events.	Home page was displayed	Pass	User input matched with the database.	4/7

	The user clicks on one of the dropped pins on the map.	Event Detail page is displayed, and the event categories match with user's questionnaire answer.	Events' categories matched with user's selection.	Pass	User selection matched with the database.	4/7
3	The user navigates to the search bar and types in reasonable keywords like "concerts."	List of events is displayed.	User typed "Cincinnati." List of events is displayed.	Pass	Search function fired API calls to retrieve data from both the APIs and the database.	4/7
4	User log-in as "Event Host."	The user is unable to navigate the rating and reviews function.	User skipped this step.	NA	NA	4/7
	User log-in as "Event Participant." Navigate to the Event Detail Page and click on rating and reviews	The user is redirected to Rating and Reviews page.	Rating and Reviews page was displayed.	Pass	The user had the appropriate authorization to access the function.	4/7
	The user enters in proper information onto Rating and Reviews page. Click Save button.	The user is redirected to Event Detail Page. Information that user have just entered gets displayed.	Information was saved after the user clicked the "Save" Button.	Pass	Data was stored in the database and was rendered back to display on the screen.	4/7

Figure 7. User 1 Test result

2. User 2: Fifth-year IT student.

Req. #	Input/Action	Expected Outcome	Actual Outcome	Pass/Fail	Explanation	Date
1	Create a new user and select “Event Participant” as their role.	A new user is created and is prompt for a questionnaire.	A new user is created.	Pass	User successfully followed workflow of the website.	4/6
	Create a new user and select “Event Host” as their role.	A new User is created and is redirected to event creation page.	A new user is created.	Pass	User successfully followed workflow of the website.	4/6
	Log-in as an “Event Participant” user.	The user is unable to locate the Event Creation Button on the navigation bar.	Event Creation Button was not displayed.	Pass	The user did not have the appropriate authorization to access the button.	4/6
	Log-in as an “Event Host” user.	The user is unable to give rating and reviews to events.	The function was not displayed when the user clicked on the Event Detail Page.	Pass	The user did not have the appropriate authorization to access the button.	4/6

2	Log-in as an "Event Participant" user.	The user is redirected to Home Page. A map is displayed with dropped pin represent events.	Home page was displayed	Pass	User input matched with the database.	4/6
	The user clicks on one of the dropped pins on the map.	Event Detail page is displayed, and the event categories match with user's questionnaire answer.	Events' categories matched with user's selection.	Pass	User selection matched with database.	4/6
3	The user navigates to the search bar and types in reasonable keywords like "concerts."	List of events is displayed.	User typed "Cincinnati." List of events is displayed.	Pass	Search function fired API calls to retrieve data from both the APIs and the database.	4/6
4	User log-in as "Event Host."	The user is unable to navigate the rating and reviews function.	The function was not displayed when the user clicked on the Event Detail Page.	Pass	The user did not have the appropriate authorization to access the button.	4/6
	User log-in as "Event Participant." Navigate to the Event Detail Page and click on rating and reviews	The user is redirected to Rating and Reviews page.	Rating and Reviews page was displayed.	Pass	The user had the appropriate authorization to access the function.	4/6

	The user enters in proper information onto Rating and Reviews page. Click Save button.	The user is redirected to Event Detail Page. Information that user have just entered gets displayed.	Information was saved after the user clicked the "Save" Button.	Pass	Data was stored in the database and was rendered back to display on the screen.	4/6

Figure 8. User 2 Test Result

3. User 3: Mid-forty local business Owner

Req. #	Input/Action	Expected Outcome	Actual Outcome	Pass/Fail	Explanation	Date
1	Create a new user and select "Event Participant" as their role.	A new user is created and is prompt for a questionnaire.	A new user is created.	Pass	User successfully followed workflow of the website.	4/7
	Create a new user and select "Event Host" as their role.	A new User is created and is redirected to event creation page.	A new user is created.	Pass	User successfully followed workflow of the website.	4/7
	Log-in as an "Event Participant" user.	The user is unable to locate the Event Creation Button on the navigation bar.	Event Creation Button was not displayed.	Pass	The user did not have the appropriate authorization to access the button.	4/7

	Log-in as an “Event Host” user.	The user is unable to give rating and reviews to events.	The function was not displayed when the user clicked on the Event Detail Page.	Pass	The user did not have the appropriate authorization to access the button.	4/7
2	Log-in as an “Event Participant” user.	The user is redirected to Home Page. A map is displayed with dropped pin represent events.	Home page was displayed	Pass	User input matched with the database.	4/7
	The user clicks on one of the dropped pins on the map.	Event Detail page is displayed, and the event categories match with user’s questionnaire answer.	Events’ categories matched with user’s selection.	Pass	User selection matched with the database.	4/7
3	The user navigates to the search bar and types in reasonable keywords like “concerts.”	List of events is displayed.	User typed “Plant Sale.” List of events is displayed.	Pass	Search function fired API calls to retrieve data from both the APIs and the database.	4/7
4	User log-in as “Event Host.”	The user is unable to navigate the rating and reviews function.	The function was not displayed when the user clicked on the Event Detail Page.	Pass	The user did not have the appropriate authorization to access the button.	4/7

	User log-in as "Event Participant." Navigate to the Event Detail Page and click on rating and reviews	The user is redirected to Rating and Reviews page.	Rating and Reviews page was displayed.	Pass	The user had the appropriate authorization to access the function.	4/7
	The user enter in proper information onto Rating and Reviews page. Click Save button.	The user is redirected to Event Detail Page. Information that user have just entered gets displayed.	Information was saved after the user clicked the "Save" Button.	Pass	Data was stored in the database and was rendered back to display on the screen.	4/7

Figure 9. User 3 Test Result

Problem Encountered

The development lifecycle is often prone to experience complications and issues. Since we are full-time students, other courses prevent us from being able to devote our full-time efforts to development. This can cause complications because, in a traditional working environment, the developers can concentrate their development efforts full-time. We have been overcoming this by dividing features amongst the developers, which we use one week, to develop. At the end of a development week, we take all of our completed features and combine them into a release. This allows us to work at our pace and convenience.

OWASP Top 10 Security Risk Analysis

1. Injection Attacks
    a. Utilize LINQ (Language Integrated Query) as a SQL querying tool in our application we protect ourselves from SQL injection attacks. User input is turned into parameter values instead of concatenating.
    b. Prevent returning any IQueryables which limits the risk of potential data leak.
    c. Encrypt web.config to hide connection string.
2. Broken Authentication and Session Management
    a. Hide session IDs from displaying in the URLs.
3. Cross-Site Scripting
    a. Razor uses HTML encoding by default.
    b. Encode JavaScript to prevent cross-site scripting vulnerabilities.
4. Insecure Direct Object References
    a. Use [Authorize] annotation where applicable to avoid insecure object references.
    b. Add multi-level access controls (Ex. in addition to [Authorize] checks, verify userId when retrieving user profile on AccountController.)
5. Security Misconfiguration
    a. Use up-to-date software with minimal known vulnerabilities.
    b. Error messages are not overly informative.
6. Sensitive Data Exposure
    a. Passwords fully encrypted using SHA-512.

7. Missing Function Level Access Control
    a. UI does not show navigation to unauthorized functions.
    b. In addition to [Authorize] tags, potentially deny by default and add roles or anonymous access where applicable.
8. Cross-Site Request Forgery (CSRF)
    a. Not Applicable to our application.
9. Using Components with Known Vulnerabilities
    a. Use up-to-date software with minimal known vulnerabilities.
10. Invalidated Redirects and Forwards
    a. Avoid using redirects and forwards.
    b. Prevent the use of user parameter in the calculation of the destinations. (This situation does not apply to our project.)

Conclusion

As a group, we learned how much of success could be done working collaboratively to build a web application. Since everyone in our group was not familiar with MVC ASP.NET, we implemented specifically assigned roles to get everyone involved in the time being until everyone was fully on board with the program chosen. When we started to brainstorm our idea of a local nearby event finder web application. One of our main concerns was where to pull API data from and whether it would be costly or not. The web application provides hosting ability for businesses and for guests to review the events that they attended. Users are delivered a short list of directions to the chosen event from their current location. Our idea of creating an on the go nearby event hub is proven to be useful and time-saving for our users. No more need to depend on different social media sites to find local events. Our web application will bundle events together and make it available in everyone's pocket with a mobile responsive implementation.

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The Local.

Spring 2017 Presentation

Our team

Mai Phuong Nguyen

Abdou Fall

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Agenda

- Problem Statement
- Technology Involves
- Deliverables
- DEMO
- Challenges Encountered
- Conclusion
- Question?


Problem!

Have you heard of … but what about …?

Have you heard of … but what about …?

Have you heard of … but what about …?

Solution!

The Local

Technologies

Deliverables

- Database Sharing
- API connections to obtain data regarding nearby shows
- Front End Improvement
- Back End Improvement
- Security Improvement

Demo

Challenges

Security

Hosting

Improve API Integration

Marketing

Additional Functionalities!

Conclusion

Question?