Review of Module 1-10

9/15/202

Introduction to Mobile Application Development

In this module, students are introduced to the concepts of design patterns and anti-patterns to inform the design and development of mobile applications. Students will also learn how to establish a mobile application development environment using contemporary software tools. Understanding how to develop a mobile application is equally important as properly designing the application. This module includes introductory information on mobile application design principles and serves as a starting point for establishing a mobile application integrated development environment. This environment will be used throughout the course to implement the design principles learned in the remaining modules.

Module One: Introduction to Mobile Application Development

Learning Objectives

- Evaluate the differences between good and poorly designed mobile applications
- Prepare a mobile application development environment

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 1
This chapter introduces design patterns and anti-patterns.

Website: Bad UI/UX Design
This blog features several apps with less-than-ideal user interfaces.

This resource supports the discussion activity.

Article: What Every App Developer Should Know About Android
This article provides an overview of the characteristics of successful apps.

This resource supports the discussion and final project review.

Tutorial: Building Your First App
This site walks you through the requirements of building an Android app.

This resource supports the final project review. Please note this resource illustrates the overall activity but may be shown in an older version of the software/tools that you are using for this course.

1-1 Discussion: Android App Design

For this first discussion, begin by introducing yourself to the class and explain your background.

Review the Bad UI/UX Design blog.

There are well over one million mobile apps on the market. It seems like every kind of app has already been created, but new apps continually surface and become successful. Reflect on mobile apps you use or have seen.

Respond to the following:

- Why do you think that, in a well-established mobile app market, there is opportunity for new apps?
- Highlight one UI element of an app featured at the Bad UI/UX Design blog, and explain why it is less than ideal.

In response to your peers, provide an approach or method to improve the featured app so the UI is more appropriate.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
30 / 30
A

Hi Dave -- The objective of Module One discussion was to explore the mobile application design principles by evaluating the differences between good and poorly designed mobile applications. I think you did well overall. You highlighted the bad design aspects of an app featured at the Bad UI/UX Design blog. You also discussed market opportunities for new apps. You said, "... When it comes to app development the sky is certainly the limit. With a great imagination anything could be executed. One of my favorite Apps to date is called "PREY." The purpose of the app is to track your device(tablet, cellphone, or laptop) if someone ever tries to steal it. What makes this app so cool is that it creates a police alarm, takes a picture of the person that has possession of the device, and then sends it to the cops. The process is very interesting; also, the alarm never stops once the device is tampered with." Good thoughts. You did an excellent job in your

response posts as well. Your responses were well detailed and thought-provoking. You demonstrated proper etiquette when responding to your peers. Overall, it was a good effort. Keep up the good work! Please refer to each section of the rubric for detailed comments.

1-3 Final Project Journal: Preparing for the Final Project
Assignment

For this assignment, you will access the Android Studio and Java SDK through SNHU's virtual desktop (VDI). Follow these instructions to access the VDI.

Once the development environment configuration is complete, follow the Build Your First App tutorial in the module reading and resources and modify the Hello World text to your name. Then, review the Final Project Part I and Part II Guidelines and Rubric documents and the Mobile Application Framework document.

The Mobile Application Framework document includes four mobile application frameworks and associated functionality sets for each one. Mobile application developers typically work in teams but are assigned a specific functionality to develop.

Select a mobile application framework and functionality set from that framework. This will be the framework and functionality set you use in your final project. Your instructor will provide you with a mobile application framework and a functionality specification document for your selection. You will use this information to develop your final project.

In your journal, detail the following:

- Screenshot of your modified Hello World App
- Any challenges you faced during the installation and configuration and how you overcame those challenges
- The functionality set you selected for the final project, including your justification for choosing that particular functionality set

For additional details, please refer to the Module One Final Project Journal Guidelines and Rubric document.

1-4 Explore Your Course Tools
Web Page

Throughout this course, you will be using the Virtual Desktop. Directions to download, install, and access the VDI are available here: VDI Instructions. For the assignments in this course we will be using Android version 6.0.1, as only Android 6.0.1, its build-tools and additional packages are installed in Android Studio via the Virtual Desktop.

MODULE 2

Designing Mobile Apps

In this module, students begin using the mobile application development environment they configured in the previous module to make progress on their final project. The discussion of mobile application design concepts is continued from the previous module with a focus on user-centric design. Students draft their graphical user interface mockups for their final project during this module. Project scope is introduced to inform future information systems managers and mobile application development project leaders about the techniques used to determine scope and control projects. In addition, pseudocode is used as a pre-development strategy. Students gain hands-on experience using pseudocode to illustrate algorithms and mobile application functionality.

ListenListen with ReadSpeaker

Learning Objectives

- Evaluate mobile application project scope issues
- Assess mobile application design factors that support human-computer interface challenges
- Translate a daily activity into pseudocode
- Develop a mobile application user interface with mockups based on business requirements

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 4
This chapter introduces user-centered design techniques and the mobile design process.

Textbook: *Android Application Development for Java Programmers*, *Chapter 3*
This chapter introduces screen layout and design configuration files. You will also gain experience with the Android emulator.

Presentation: PseudoCode
This SlideShare presentation provides an excellent overview and several examples of pseudocode.
This resource supports the short paper.

Article: Designing and Explaining Programs With a Literate Pseudocode
This article provides detail and examples of pseudocode.
This resource supports the short paper.

Website: Balsamiq Mockups
You can download the free software from this website to create mockups for mobile apps.
This resource supports module assignments.

Website: Moqups
This website offers more free software you can use to create mockups.
This resource supports module assignments.

Tutorial: Creating a Mobile Application
This website provides a step-by-step tutorial with text and videos for mocking up a mobile app using Balsamiq.
This resource supports the project journal.

2-1 Assignment: Project Scope and Pseudocode

Instructions

The objective of this assignment is to demonstrate your understanding of how to identify the scope of a mobile application design and development project and how to write pseudocode.

Part I

Identifying a mobile application design and development project's scope is critical to help ensure the allocation of sufficient resources and to establish realistic expectations. Given the concepts of context, persona, and vision, from the module readings, evaluate how the relative importance of these concepts might be affected when designing apps of a particular type or for a particular device. Justify your explanation, and discuss the benefits of this knowledge in your own design.

Part II

Writing pseudocode for your mobile application can result in great benefits, which include gaining a greater appreciation for a project's scope. The act of pseudocoding is relatively easy, with virtually no training required. You are simply writing down steps in sequential order. After you have gone through the process a few times, you will quickly become proficient.

Refer to the two pseudocode presentations and then briefly describe a simple daily activity you perform and write pseudocode for it. Examples include brushing your teeth, combing your hair,

eating cereal, and donning your shoes.

For additional details, please refer to the Module Two Assignment Guidelines and Rubric document.

Submissions

- 2-1 Assignment- Project Scope and Pseudocode_dave_hinds.docx(9.71 KB)

  Jul 1, 2020 10:07 PM

Upload Submission
Drop files here, or click below!

You can upload files up to a maximum of 1 GB.

Feedback
50 / 50
A

Hi Dave -- The objective of this assignment was to demonstrate your understanding on how to identify the scope of a mobile application design and development project and how to write pseudocode. You did well on both of these aspects! You demonstrated the knowledge of context, persona, and vision that helped to set up the scope for your project. You said, "... My application would be targeting everyone. The problem i'm attempting to bridge does affect both young and old; therefore, I will have a large audience that will be in dire need of this solution. Telenet will be affordable to all hospitals. Doctors will have an edge on how it works with proper training and guidance." You also wrote pseudocode for one of the activities you perform daily. In the next Module, you will use the knowledge gained from this activity to write pseudocode for your project. Nice work overall!

2-2 Final Project Journal: Graphic User Interface Mockups
Assignment

Developing mockups of mobile application user interfaces is an important component of mobile application design. This week, you will develop screen and dialog mockups for your final project. You will use the application framework and functionality set you selected in Module

One. If you have not previously selected a framework or functionality set, please refer to the Mobile Application Framework document and select a mobile application framework and functionality set from that framework.

Refer to the Creating a Mobile Application tutorial for examples.

The mockups you are creating simply display the way you want your app to look and how the UI is laid out. You can use one of the optional website tools, word processing software, presentation software, graphics programs, or even pencil and paper.

Submit your mockups in your journal and reflect on the process and any challenges you faced along the way.

For additional details, please refer to the Module Two Final Project Journal Guidelines and Rubric document.

MODULE 3

Fragmentation and Pseudocode

In this module, students will complete their work with pseudocode, learn the concept of fragmentation, review Android device trends, and explore Java classes for the implementation of user interface controls. The submission of the student's mobile application's pseudocode will be informed by the previous module and instructor feedback. After final review of the pseudocode, students will be ready to start the development phase of their final project. Learning about the concept of fragmentation and Android device trends will help students understand how their design choices impact the business and users. The final component of this module is the introduction to Java classes for the implementation of user interface controls.

Module Three: Fragmentation and Pseudocode

Learning Objectives

- Compare different Android operating system versions
- Examine trends with Android devices
- Integrate an appropriate approach to pseudocode to create algorithms for mobile application functionality

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 3
This chapter introduces to the concept of Android fragmentation. It also discusses Android device trends.

Textbook: *Android Application Development for Java Programmers*, Chapter 4
This chapter introduces various user interface controls. It also discusses Java classes to implement controls.

Website: Android History
This website features complete features and capabilities of each Android operating system version.
This reference supports the discussion activity.

Website: Sweet History of Android
This website details how Android was started, how it evolved, and how the hardware landscape changed over time.
This reference supports the discussion activity.

3-1 Discussion: Fragmentation

As you consider your own app development, discuss your approach to fragmentation. How would you weigh the balance of features and usability for the array of hardware devices available now?

In response to your peers, comment on their approach, specifically highlighting its potential impact on professional ethics.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
30 / 30
A

Hi Dave -- The objective of Module Three discussion was to compare different Android operating system versions and the trends with the Android devices to understand how your design choices would impact the business and users. You did well on this discussion! You discussed your approach to fragmentation for your own app development, and weighed the balance of features and usability for the array of hardware devices available now. You said, "... Fragmentation has been on the side of the consumer for quite some time, but it can also be very

complex for many devices. I will be working on the last app 'Healing Hospital.' There are a few things with regards to how fragmentation could affect both the hardware and software of an app, especially if its not carefully tested. (Beacon)." Good thoughts. You did an excellent job in your response posts as well. Your responses were well detailed and thought-provoking. You demonstrated proper etiquette when responding to your peers. Overall, it was a good effort. Keep up the good work! Please refer to each section of the rubric for detailed comments.

3-2 Final Project Journal: Mobile Application Pseudocode
Assignment

For your journal assignment this week, develop the pseudocode for each navigation component and all functionality of the mobile application project you chose for your final project. Each component and functionality should be on its own page.

For additional details, please refer to the Module Three Final Project Journal Guidelines and Rubric document.

3-3 Check-In Journal: Final Project (Part I)
Assignment

At this point in the course, you should have completed the following, which will assist you in completing both final projects:

- Reviewed the final project requirements
- Selected a mobile application framework
- Selected a functionality set
- Drafted mockups for your functionality and dialogs
- Drafted pseudocode for functionality and navigation

Write a brief summary in your journal of your final project status.

MODULE 4

Design Patterns and Anti-Patterns

In this module, students will complete their work with pseudocode, learn the concept of fragmentation, review Android device trends, and explore Java classes for the implementation of user interface controls. The submission of the student's mobile application's pseudocode will be informed by the previous module and instructor feedback. After final review of the pseudocode, students will be ready to start the development phase of their final project. Learning about the concept of fragmentation and Android device trends will help students understand how their

design choices impact the business and users. The final component of this module is the introduction to Java classes for the implementation of user interface controls.

Module Four: Design Patterns and Anti-Patterns

Learning Objectives

- Assess what is an effective and appropriate welcome experience
- Discuss what is an effective and appropriate home screen
- Define an approach to address functional requirements in a mobile application

Reading and Resources

Textbook: Android Design Patterns: Interaction Design Solutions for Developers, Chapters 5 and 6

Chapter 5 introduces the importance of creating a welcoming experience for users. It also discusses common traps to avoid.

Chapter 6 introduces the concept of telling a story with a mobile application's home screen.

Article: 30 Recent Inspirational UI Examples in Mobile Device Screens
This article features innovative and cleanly designed mobile welcome experiences and home screens. This resource supports the short paper.

Article: Bad Mobile Apps – UI Design Gone Wrong
This article features several examples of mobile design anti-patterns. This resource supports the short paper.

Tutorial: Building a Simple User Interface
This tutorial demonstrates how to create and program navigational controls using Android Studio. This resource supports the project journal.

Please note this resource illustrates the overall activity but may be shown in an older version of the software/tools that you are using for this course.

Website: 2015 Webby Awards for Best User Experience
This site features the 2015 Webby Award winners for best user experience in the Mobile Sites & Apps category. This resource supports the short paper.

4-1 Assignment: Welcome Experience and Home Screen
Assignment

The welcome experience is arguably one of the most important design challenges for mobile application designers and developers. The home screen can be considered the most important app screen. With just a quick glance, users should be able to determine what the app does and how it works.

For this assignment, support or argue the significance of the welcome experience. Provide an example from the 30 Recent Inspirational UI Examples in Mobile Device Screens article that illustrates your point.

Select one of the design patterns featured in Chapter 6 of the *Android Design Patterns: Interaction Design Solutions for Developers* textbook. Select an app from the Bad Mobile Apps – UI Design Gone Wrong article that follows one of these patterns. Provide recommendations on how to improve the app.

For additional details, please refer to the Module Four Assignment Guidelines and Rubric document.

MODULE 5

Designing With Search Patterns

In this module, students will examine mobile app design patterns and design anti-patterns regarding search functionality. With the pervasive use of mobile apps to search user and non-user data, the significance of properly designing search interfaces and functionality cannot be overstated. Whether the user is searching for local weather or presidential polling information, the user experience should follow one of the presented design patterns and avoid the related anti-patterns. The design patterns covered in this module will help students improve on their final projects.

Module Five: Designing With Search Patterns

Learning Objectives

- Critique an existing mobile application's search functionality for effectiveness and appropriateness
- Defend an approach to search functionality for mobile applications

- Evaluate the challenges inherent in creating search functionality for mobile applications
- Create a functioning mobile application based on requirements with an appropriate human-computer interface

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 7
This chapter introduces mobile application search patterns. It also examines the advantages and disadvantages of using voice recognition

Article: UI Patterns for Mobile Apps: Search, Sort and Filter
This article contains a thorough overview of search patterns for mobile apps and provides several implementation examples. This resource supports the short paper.

Article: Search Overview
This article provides an overview of the search framework for Android development. It also provides key information regarding protecting user privacy. This resource supports the short paper.

5-1 Assignment: Designing Search Functionality
Assignment

For this assignment, you will discuss the significance of UI patterns for mobile apps and techniques that can be used to create a great user experience with regard to search functionality. You will also include the significance of protecting user data.

For additional details, please refer to the Module Five Assignment Guidelines and Rubric document.

5-2 Final Project Part I Milestone One: Functioning Mobile Application
Assignment

For this assignment, submit your working mobile application to demonstrate all of the critical elements as described in the Final Project Part I Guidelines and Rubric document. This milestone consists of your completed and fully functioning (based on the function set you selected) mobile application. You will submit your work in two parts, the *.APK file and the compressed/zipped file of your raw project folders/files.

This will serve as a draft of the final version of your application, and you will apply your instructor's feedback on this assignment to complete your final submission.

The project journals in Modules One, Two, and Three will help you complete this milestone.

For additional details, please refer back to the Final Project Part I Guidelines and Rubric document and the Milestone Guidelines and Rubric document.

MODULE 6

Designing With Sort and Filter Patterns

This module continues to explore mobile application design and anti-design patterns. Search functionality was reviewed in the previous module, and key to that review was the need to "display the results in a meaningful way." In this module, that need is thoroughly examined to help ensure students are able to properly design mobile apps in regard to allowing users to sort and filter search results. Knowledge gained from this module will help inform final project designs and functionality.

Learning Objectives

- Evaluate effective and appropriate sorting and filtering functionality set in an existing mobile application
- Create a mobile application based on business requirements that demonstrates ethical and professional practices

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 8
This chapter provides insights into the importance of providing users with data management options. It also examines sorting and filtering design patterns.

Article: UI Patterns for Mobile Apps: Search, Sort and Filter
This article contains a thorough overview of search patterns for mobile apps and provides several implementation examples.
This article supports the discussion activity.

The concepts of sorting and filtering search results are not new. In many cases, users expect this type of functionality from the mobile apps they use. Not every mobile app will require this type of functionality, but for those that do, it is important to design the functionality with the user in mind. Specifically, the design should be intuitive and applicable for the application. While the concepts of sorting and filtering are inexorably linked, it is important to look at them individually.

Sorting

Often, users search for data and receive more results than they can handle. If students are searching classes to take in a future semester or term, they might type "computer" in a search box and receive page after page of search results. One method of making the data more usable is to sort the data by one of the data elements. In Table 6.1, the data consists of six columns: Course Identification (Course ID), Course Name, Upper Level / Lower Level (UL/LL), Credit Hours (Hours), Term, and Instructor. Imagine that several hundred results were returned from the user's

search request. That would make looking for the courses a very long task. Given the six columns, the user could make the data more manageable by clicking a column to sort. If the user knows the title of the course, she can sort by Course Name and then scroll through the data.

Course ID	Course Name	UL/ LL	Hours	Term	Instructor
IT-300	Introduction to OOP	UL	3	1503	J. Patterson
IT-301	Advanced Programming Fundamentals	UL	3	1504	K. Mobilat
IT-300	Introduction to OOP	UL	3	1505	T. Recoaster
IT-400	Artificial Intelligence	UL	3	1507	C. Bechedule
IT-395	Game Engines	UL	3	1502	R. Jayling
IT-200	Introduction to C++	LL	3	1502	D. Oport

Table 6.1: Sample Course Schedule

Filtering

Filtering is a design pattern used to narrow the amount of data displayed. For example, a user might be using a store's mobile app to shop for a table saw. She might start by selecting a department and then add additional filters until she sees the item she wants. Figure 6.2 illustrates how the data was filtered: by Department (Tools), then Power Tools and, finally, Saws. With the final filter in place, three types of saws (Miter, Table, and Band) were revealed.

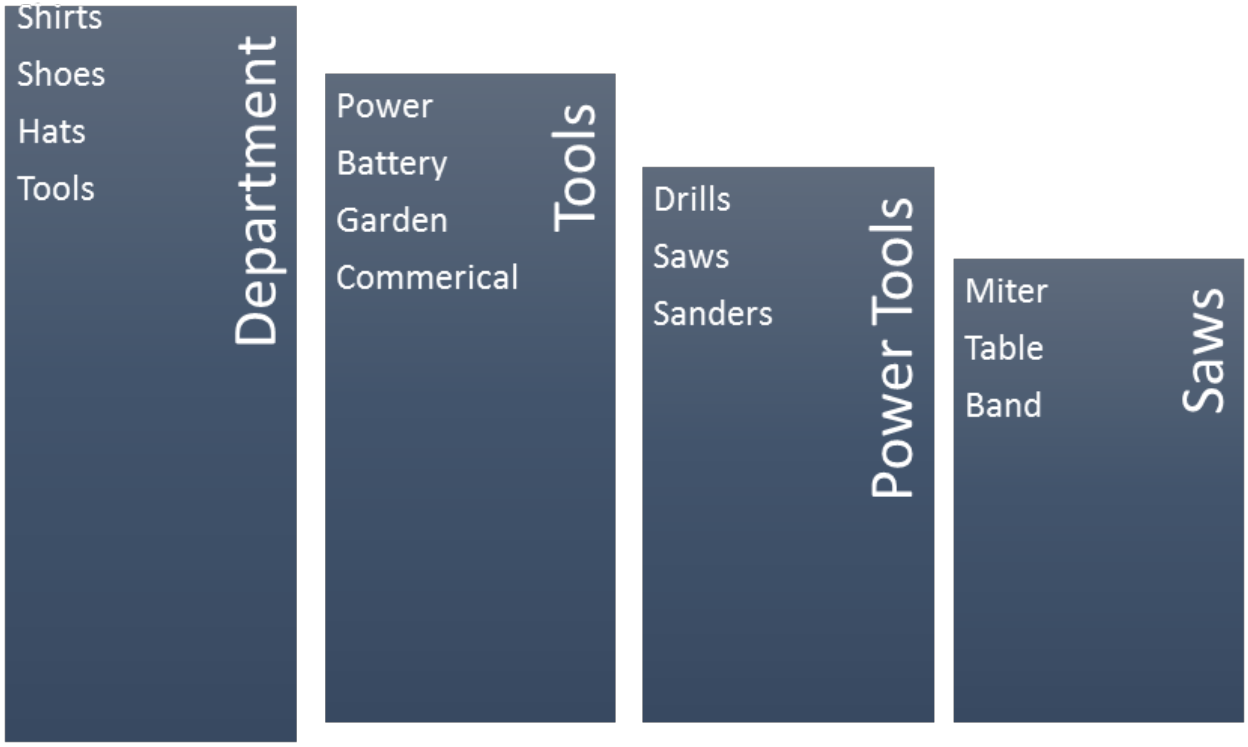

Figure 6.2: Filtering Example

This type of design pattern is meant to give users the power to look and find the data they desire. In Module Seven, students will learn the importance of ensuring the accuracy of search results. Moreover, students will learn design techniques to help ensure users' searches return accurate and contextual results.

6-1 Discussion: Sorting and Filtering Design Patterns

In the previous module, you reviewed and discussed the importance of search functionality in mobile apps. Once the data has been searched for, there is often the need to sort and filter the data. Select one of the design patterns featured in Chapter Eight of the Android Design Patterns: Interaction Design Solutions for Developers textbook. Using the UI Patterns for Mobile Apps: Search, Sort and Filter article, select a mobile app from the Google Play Store that follows one of these patterns poorly. Provide recommendations on how to improve the app. Try not to feature an app already featured by another student.

Analyze the recommendations from your peers. How effective will the recommended approach to implementing the design pattern be? Defend your assessment.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
28.2 / 30
A

Hi Dave -- In many cases, users expect the functionality of sorting and filtering search results from the mobile apps they use. Not every mobile app will require this type of functionality, but for those that do, it is important to design the functionality with the user in mind. Specifically, the design should be intuitive and applicable for the application. The objective of Module Six discussion was to select a mobile app from the Google Play Store that follows one of the patterns specified in Chapter Eight of the Android Design Patterns: Interaction Design Solutions for Developers textbook poorly. You did a good job on this discussion. You explained how the mobile app you chose follows anti-patterns, and provided your recommendation on how to improve the app. Overall, it was a good effort. There are some areas for potential improvement -- such as improving discussion engagement. Please refer to each section of the rubric for detailed comments.

6-1 Discussion: Sorting and Filtering Design Patterns
Discussion Topic

Starts Jul 25, 2020 11:59 PM

In the previous module, you reviewed and discussed the importance of search functionality in mobile apps. Once the data has been searched for, there is often the need to sort and filter the data. Select one of the design patterns featured in Chapter Eight of the Android Design Patterns: Interaction Design Solutions for Developers textbook. Using the UI Patterns for Mobile Apps: Search, Sort and Filter article, select a mobile app from the Google Play Store that follows one of these patterns poorly. Provide recommendations on how to improve the app. Try not to feature an app already featured by another student.

Analyze the recommendations from your peers. How effective will the recommended approach to implementing the design pattern be? Defend your assessment.

All discussion posts will be graded using the Discussion Rubric document.

6-2 Check-In Journal: Final Project (Part II)
Assignment

Post an update in your journal to your instructor regarding your progress in the Design Defense portion of your final project. This is an opportunity to obtain instructor help and feedback.

At this point in the course, you should have completed the Function and Requirements and Mobile Application Framework sections of Final Project Part II. You should have begun working on the Mobile Application Approach section.

Write a brief summary in your journal of your final project status.

This is a credit/no credit assignment.

MODULE 7

Ensuring Accurate Results

In the past few modules, students have studied design patterns and anti-patterns with a specific focus on search, sort, and filter functionalities. The goal has been to give users the ability to easily search for data and review, sort, and filter the results. In this module, students will learn the importance of ensuring the accuracy of search results. Moreover, students will learn design techniques to help ensure users' searches return accurate and contextual results.

Module Seven: Ensuring Accurate Results

Learning Objectives

- Evaluate the significance of avoiding missing or inaccurate search results
- Recommend modification to the design of an existing app to counter the anti-pattern
- Assess the challenges inherent in ensuring accurate results to search functionality in mobile applications

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 9
This chapter introduces user-centric, contextual mobile application design. It also covers how to make user-proof applications.

Tutorial: Creating a Search Interface
This tutorial provides detailed instructions on how to create a search interface in a mobile application. Following the presented steps will help ensure common pitfalls are avoided and search results are accurate.
This resource supports the discussion activity.

Please note this resource illustrates the overall activity but may be shown in an older version of the software/tools that you are using for this course.

Presentation: User Centered Design in Mobile App Development
This presentation illustrates the fundamentals of user-centered design regarding mobile app development.
This resource supports the discussion activity.

Presentation: User Centered Design
This presentation provides details on how to embed users into the design process.
This resource supports the discussion activity.

Mobile App: Meeting Calculator
This app is listed in the Google Play App Store and has sufficient screenshots to permit an effective UI review.
This resource supports the discussion activity.

Mobile App: Brew Blender
This app is listed in the Google Play App Store and has sufficient screenshots to permit an effective UI review.
This resource supports the discussion activity.

7-1 Discussion: Design Patterns and Anti-Patterns to Ensure Accurate Results

Discussion Topic

Starts Aug 1, 2020 11:59 PM

In the previous two modules, you explored the significance of search functionality and the importance of providing users with the ability to sort and filter their results. Select one of the design patterns or anti-patterns featured in Chapter Nine of the *Android Design Patterns: Interaction Design Solutions for Developers* textbook.

Review the screenshots from one of the mobile apps listed in the Module Seven reading and resources section, or one of your choosing. Post a screenshot that follows one of these patterns poorly or exhibits one of the anti-patterns. Provide recommendations on how to improve the app. Be sure not to feature an app already featured by another student.

Note: You can effectively evaluate an app by reviewing the screenshots in the app store. You do not necessarily need to download apps you review.

In response to your peers, critique their analysis and provide either additional support to their assessment or information to support the opposing assessment.

All discussion posts will be graded using the Discussion Rubric document.

7-2 Final Project Part I Final Submission: Mobile Application with Annotated Source Code

Assignment

For this task, you will submit your completed Android Mobile Application with Annotated Source Code. It should be a complete, polished artifact containing all of the critical elements of the final product. You will submit your work in two parts, the *.APK file and the compressed/zipped file of your raw project folders/files. It should reflect the incorporation of feedback gained throughout the course.

For additional details, please refer to the Final Project Part I Guidelines and Rubric document.

MODULE 8

Data Entry Design Patterns

In this module, students will explore common user interfaces used with data entry design patterns in mobile applications. The significance of permitting the user the ability to enter data is highlighted. Design patterns covered in this module build upon previously covered design patterns. Further, the use of data entry and the design of the requisite interfaces will provide students with a new perspective on their final projects.

Module Eight: Data Entry Design Patterns

Learning Objectives

- Evaluate the design fundamentals regarding data entry in mobile applications
- Assess the technical and ethical challenges inherent in data entry operations within mobile applications

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapters 10 and 11

Chapter 10 introduces the complexities involved with user input on mobile devices. It also explains how to strategically use various data entry patterns.

Chapter 11 introduces the challenges involved with implementing forms on mobile devices and how to overcome these challenges.

Tutorial: Text Fields
This tutorial provides detailed information on using text fields for data entry and how to implement them in an Android app.

This tutorial supports the discussion activity. Please note this resource illustrates the overall activity but may be shown in an older version of the software/tools that you are using for this course.

This module introduces the concept of data entry and design patterns to implement that functionality. Nearly every app requires some sort of user input. The input could be as simple as entering a zip code or city for a weather app, clicking on a level graphic for a game, or tapping the play button on a video. More complex apps require additional input, often in the form of text. The goals for data entry include:

- An intuitive design
- Helping the user prevent data entry errors

- Detecting data entry errors
- Processing the data entered

This module examines each of these goals. Figure 8.1 illustrates some of the most common user input interfaces. These interfaces will be referenced later in this module.

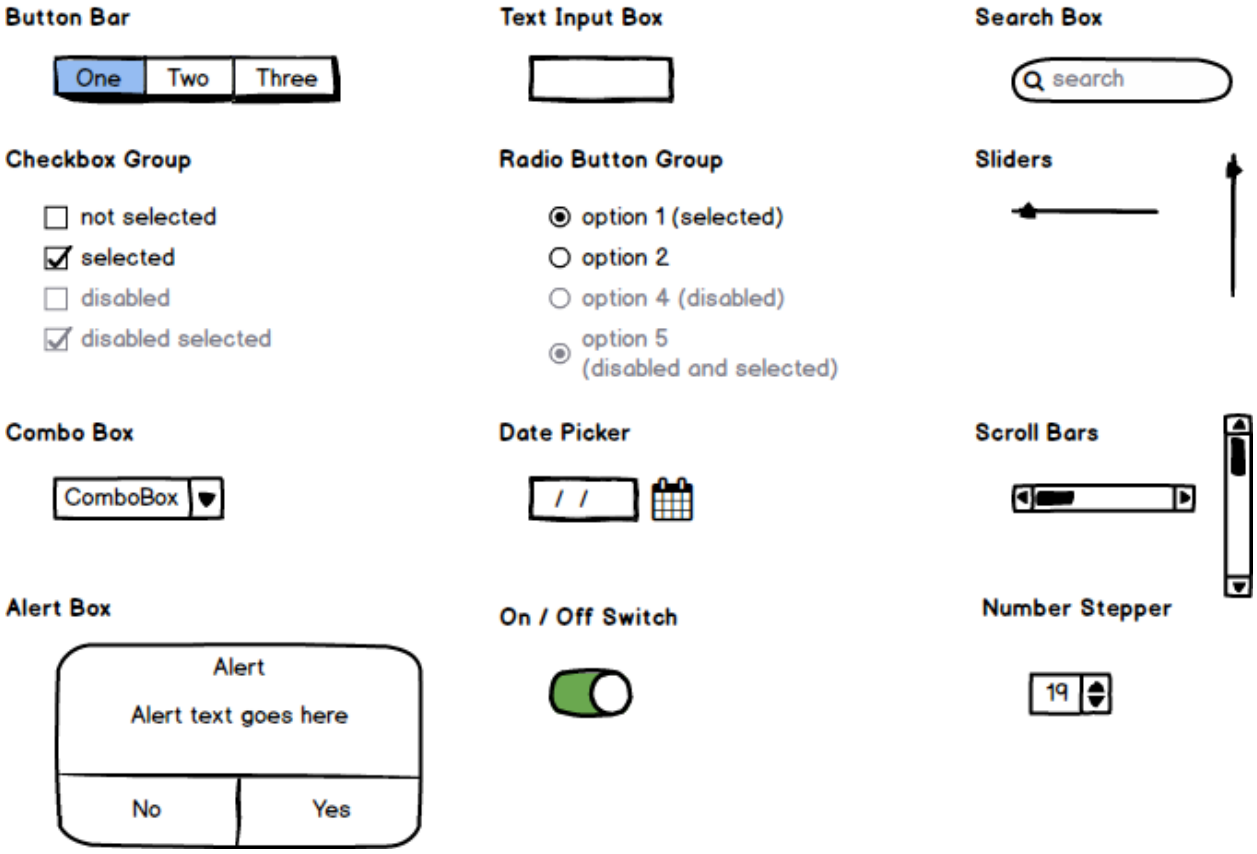

Figure 8.1: Common User Input Interfaces

Intuitive Design

The concept of intuitive design has been a theme throughout this course. It is applicable to all of the design patterns explored so far. When data entry is involved, mobile app designers should ask a series of questions to help inform the design process. What data is expected? What are the possible values or ranges of data? Is the data mandatory? How can the user best enter the data? The answers to these questions and more will help the designer make informed decisions regarding design patterns and interface layout.

There are a few easy techniques a designer can use to improve upon the intuitive nature of the design:

- Provide logical interface elements for the given data. For example, do not use a scroll bar to have the user indicate gender. In this case, you would likely use radio buttons.
- Ensure text input boxes are adequately sized to hold the expected information. This can be challenging on mobile devices, especially when longer text such as email addresses is required.

- Ensure all data entry elements are properly labeled. Users should know what is being expected in each element.
- When a digital keyboard is evoked, ensure it does not cover the data entry area.

Helping the User Prevent Data Entry Errors

The term "user-proof" is often used to refer to designing and developing an app in which the user cannot make mistakes or, in this data entry context, cannot enter erroneous data. There are three primary methods to achieve this.

1. **Interface Component Selection:** Select the appropriate user input interface component. For example, use a number stepper so the user can enter her age and a date picker for her date of birth.
2. **Limit Enforcement:** In certain circumstances, the designer can program the interface components to allow only certain values, thereby preventing incorrect information from being entered. An example would be a slider used to indicate a percentage range for income tax calculations. The slider would be configured to have a low value and high value of 0% and 100%, respectively. When appropriate, limits can also be enforced by selecting an interface component that simply has users select from a given list.
3. **Data Validation:** As users enter data, it can be checked for accuracy. For example, an email address can be checked to ensure it includes the "@" symbol and a .net, .com, .org, .edu, or other value domain extension.

Detecting Data Entry Errors

The goal of detecting data entry errors is an extension of the data validation solution to preventing data entry errors. Data integrity is an important issue, which is why it is a separate goal. Each piece of data we collect in our apps potentially has the ability to be incorrect. When possible, we can analyze the collected data against any rules we have set up to ensure the user provides what is expected. Including alert boxes is a common way to alert the user that the data entered was not what was expected. When informing the user, it is important to provide guidance instead of an error message. Figure 8.2 illustrates both methods.

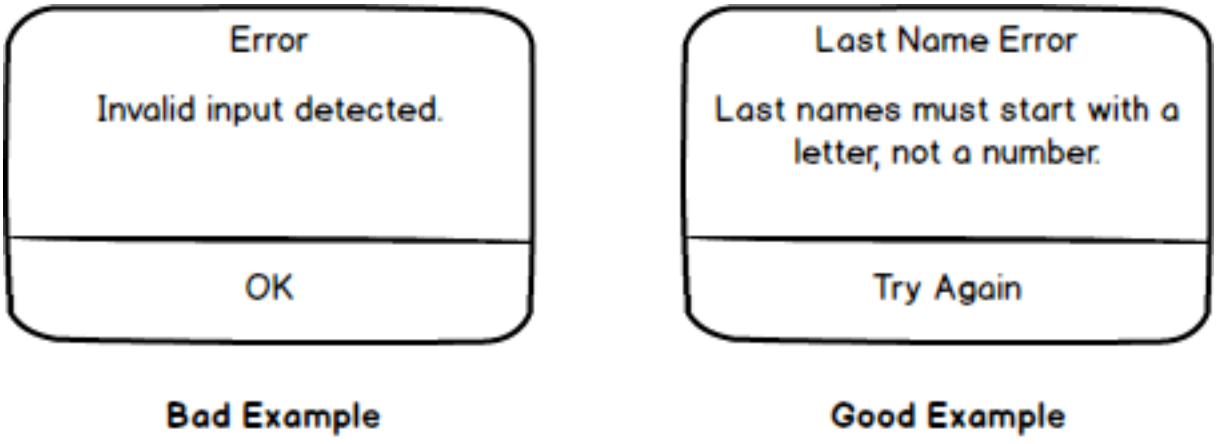

Figure 8.2: Alerting the User

Processing the Data Entered

After all the data is collected and, to the best of the app's ability, verified as correct, it needs to be processed. A few techniques can ensure this is done correctly.

1. For large data, store it locally on the device before uploading it to cloud-based servers. This is not always applicable, but when data is being exchanged between a mobile device and a cloud server, it can be beneficial to store, even if just temporarily, the data locally. This will help prevent the user from having to re-enter the data if there are problems.
2. Use encryption when applicable. Do not transmit user passwords or account information using open-text methods. Your users will want to know how their data is being protected.
3. If data is being stored on the mobile device, ensure users are aware of it. When appropriate, allow users the ability to password protect their stored data.

In Module Nine, students complete the exploration of mobile app design patterns and anti-patterns. They will learn how to implement navigation design patterns and how to avoid anti-patterns that can erode the user experience.

8-1 Discussion: Data Entry Issues

Data entry is a common functionality set for mobile applications. Ideally, data entry should be intuitive and easy for users. Users can also have multiple methods of inputting data. For this discussion, select one of the design patterns featured in Chapter 10 of the *Android Design Patterns: Interaction Design Solutions for Developers* textbook. Select a mobile app featured in the textbook that follows one of these patterns poorly. Provide recommendations on how to improve the app. Be sure not to feature an app already featured by another student.

Note: You can effectively evaluate an app by reviewing the screenshots in the app store. You do not necessarily need to download apps you review.

In your response to your peers, review their findings and recommendations and address the following:

- What are the ethical challenges regarding the mobile application they featured?
- How can the ethical challenges best be overcome?
- Provide an assessment of how the students' recommendations will improve the existing app.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
28.5 / 30
A

Hi Dave -- Data entry is a common functionality set for mobile applications. Ideally, data entry should be intuitive and easy for users. Users can also have multiple methods of inputting data. The objective of Module Eight discussion was to discuss data entry issues. You selected a mobile app featured in the textbook that follows one of the design patterns mentioned in the textbook.

You did a good job in your response posts. You demonstrated proper etiquette when responding to your peers. Overall, it was a good effort. Keep up the good work! Please refer to each section of the rubric for detailed comments. 8-2 Check-In Journal: Final Project (Part II)

Instructions

Post an update in your journal to your instructor regarding your progress in the Design Defense portion of your final project. This is an opportunity to obtain instructor help and feedback.

At this point in the course, you should have completed the following, which will assist you in completing Final Project Part II:

- Function and Requirements and Mobile Application Framework sections completed
- Mobile Application Approach section submitted for instructor feedback

Write a brief summary in your journal of your final project status. This is a credit/no credit assignment.

Submissions

- 8-2 Check-In Journal- Final Project (Part II)_davehinds.docx(10.31 KB)

  Aug 14, 2020 7:25 PM

Upload Submission
Drop files here, or click below!

You can upload files up to a maximum of 1 GB.

Feedback
10 / 10
A

This journal is for Part II. Hope you are on track towards completing the part II. I am looking forward to reviewing your design defense. In case you have any questions, please don't hesitate to contact me.

MODULE 9

Module Nine: Navigation Design Patterns

Learning Objectives

- Justify a modified approach to an existing mobile application
- Critique a mobile application's effectiveness in addressing human-computer interface challenges
- Synthesize human-computer interface challenges and associated resolutions

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapter 13
This chapter introduces navigation patterns and how to implement them.

Tutorial: Implementing Effective Navigation
This tutorial demonstrates how to implement effective navigation in mobile applications.

This resource supports the discussion activity. Please note this resource illustrates the overall activity but may be shown in an older version of the software/tools that you are using for this course.

Module Overview

This module introduces students to navigational design patterns and anti-patterns. Many of the previously examined design patterns were related to navigation. Nearly every app uses navigation. If an app lacked navigational controls, the user would launch the app and not be able to do much. It only takes a quick review of one's existing mobile apps to realize how heavily they rely on navigation. In the context of design patterns, navigation is initiated by user interaction, resulting in visual focus switching from one screen or screen area to another.

There are virtually an unlimited number of different user interface components that can be used for navigation. These include buttons, text links, icons, images, sliders, menus, and more. It is important to ensure the most common navigational components are understood in regard to good design patterns. It is equally important to know what pitfalls, or anti-patterns, to avoid. The six controls illustrated in Figure 9.1 are among some of the most commonly used navigational controls. Each is examined in the following sections.

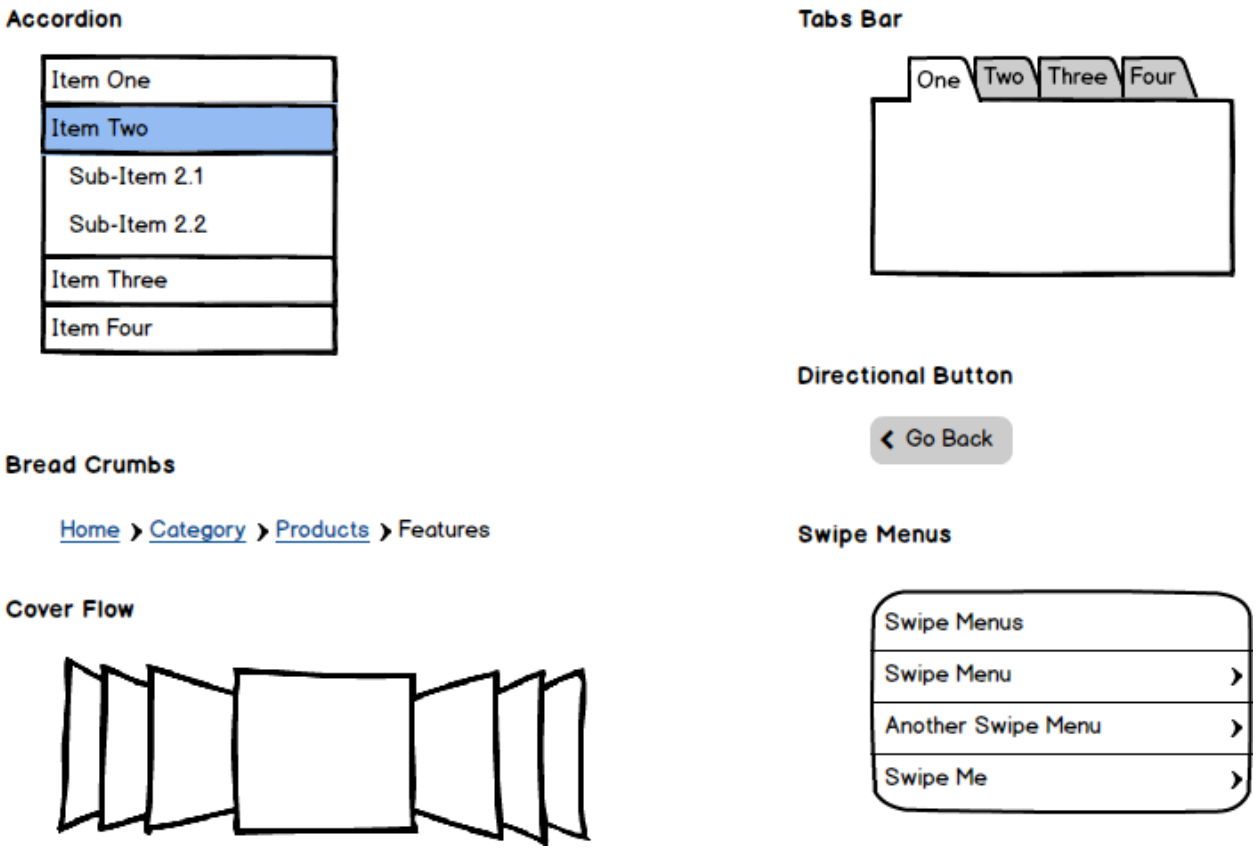

Figure 9.1: Common Navigation Interface Objects

Accordion

The accordion navigational interface is typically found more in web applications than mobile apps. However, with the growing popularity of tablets and large screen smartphones, the use of this interface is finding a new resurgence. Accordions are a good way of encapsulating hierarchical menu choices. When one top menu choice expands, all others collapse. Only one menu layer will display sub-items at a time. The best use case is that the entire accordion should be visible on a single screen without the need for scrolling. With smaller mobile devices, this can be challenging.

Bread Crumbs

The use of bread crumbs can provide the user with a text-based visual indication of where they are in the hierarchy of the app's content. This is a good alternative to using a "back" button that the user has to tap several times, not knowing where each tap will take her. With bread crumbs, the user can go back one level, all the way back home, or anywhere in between with a single tap.

Cover Flow

The cover flow interface started as an Apple-only interface used mostly for iTunes. Today, the interface has become somewhat standard for the web and some mobile applications. The concept is that thumbnail images are on a virtual carousel and the user can spin it in either direction. The

up-front and center image is displayed in its entirety with only partial visibility of remaining images. Tapping on the center image typically evokes navigation. Figure 9.1 provides a clear illustration of this interface.

Tabs Bar

The tabs bar can be presented with tabs horizontally on the top or vertically on the left. When there are just a few major areas of an app and it makes logical sense for the user to be able to switch between them quickly, this interface might be appropriate. It is important that all tabs are visible without the need for scrolling. Also, it should be clear to the user which tab is the active one.

Directional Button

Directional buttons are similar to regular buttons that have a visual indication of direction, typically left (back) or right (forward).

Swipe Menus

Swipe menus are sometimes referred to as swipe buttons. The user swipes them left, right, up, or down (as dictated by the app) to initiate an action. Ideally, there will be a visual indication regarding the direction to swipe, as illustrated in Figure 9.1.

In Module Ten, students will explore the future of mobile application development. A brief look at the history of mobile app development is followed by a cursory review of current tools and techniques used to develop mobile apps. Students will learn about the different mobile operating systems and compare development tools associated with each.

9-1 Discussion: Navigation Design Patterns and Anti-Patterns

Navigation is a critical component of mobile application design. Select one of the design patterns featured in Chapter 13 of the *Android Design Patterns: Interaction Design Solutions for Developers* textbook. Select a mobile app from the textbook that follows one of these patterns expertly or suffers from one of the anti-patterns. Defend or critique the app's approach based on your readings. Also, recommend and defend a different approach that also addresses human-computer interface considerations. Be sure not to feature an app already featured by another student.

Note: You can effectively evaluate an app by reviewing the screenshots in the app store. You do not necessarily need to download the apps you review.

In your response to your peers, critique their recommendations and predict how effective their recommendations are. Defend your prediction.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
30 / 30
A

Hi Dave -- There are virtually an unlimited number of different user interface components that can be used for navigation. These include buttons, text links, icons, images, sliders, menus, and more. It is important to ensure the most common navigational components are understood in regard to good design patterns. It is equally important to know what pitfalls, or anti-patterns, to avoid. The objective of Module Nine discussion was to research and critique an app based on one of the navigational patterns you selected from the textbook. You did well on this discussion! You selected a mobile app featured in the textbook that follows one of the design patterns mentioned and provided your critique. You recommended and defended a different approach that also addresses human-computer interface considerations. You did an excellent job in your response posts as well. Your responses were well detailed and thought-provoking. You demonstrated proper etiquette when responding to your peers. Overall, it was a good effort. Keep up the good work! Please refer to each section of the rubric for detailed comments.

MODULE 10

The Future of Mobile Application Development

In this module, students will explore the future of mobile application development. A brief look at the history of mobile app development is followed by a cursory review of current tools and techniques used to develop mobile apps. Students will learn about the different mobile operating systems and compare development tools associated with each. Building on the historical review and analysis of current tools, the future of mobile application development will be explored.

Module Ten: The Future of Mobile Application Development

Learning Objectives

- Synthesize specific design patterns with real-world analysis of the future of mobile application development
- Formulate an assessment of future ethical issues specific to a selected design pattern

Reading and Resources

Textbook: *Android Design Patterns: Interaction Design Solutions for Developers*, Chapters 12 and 14

Chapter 12 provides an overview of the Android operating system and hardware that includes how they are different from others available in the market.

Chapter 14 provides a review of design patterns and a unique look at tablet patterns.

10-1 Discussion: Reflection

Over the past nine weeks, you explored mobile application design and development with a specific focus on design patterns, requirements, and challenges. Take this time to share with your classmates what you have learned. In your initial post, respond to the following.

- Select one design pattern that you applied in your final project. Explain how you implemented the design pattern and why.
- Using the same design pattern, explain how its applicability could change in the future.
- Address any related ethical issues regarding use of this design pattern.

Respond to at least two classmates with comments on their predictions and reflection. Discuss how their predictions could impact your selected design pattern.

All discussion posts will be graded using the Discussion Rubric document.

Feedback
30 / 30
A

Hi Dave -- The objective of this discussion was to share with your classmates what you have learned over the past nine weeks. You did well on this discussion! You selected a design pattern that you applied in your final project and explained how you implemented the design pattern and why. You also addressed any related ethical issues regarding use of this design pattern. You did an excellent job in your response posts as well. Your responses were well detailed and thought-provoking. You demonstrated proper etiquette when responding to your peers. Overall, it was a good effort. Keep up the good work! Please refer to each section of the rubric for detailed comments.