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Assignment 3 – System Implementation and Evaluation

Introduction

In this report, I present the implementation and evaluation of the **Travel Agency System**, a project aimed at creating an interactive and user-friendly platform for managing travel bookings. Utilizing Java within the NetBeans integrated development environment (IDE), I applied design concepts learned throughout my coursework to develop a robust user interface (UI) that adheres to essential Human-Computer Interaction (HCI) principles.

The objectives of this project were to create a functional prototype that facilitates travel bookings and user interactions while also evaluating its usability against established heuristic principles. This report outlines the implementation process, heuristic evaluation results, and reflections on the system's strengths and weaknesses.

System Implementation

Project Setup

To initiate the project, I created a new Java project titled "TravelAgencySystem" in NetBeans. I opted for Java Swing as the GUI toolkit due to its capability to build desktop applications with a rich set of user interface components. This decision was pivotal as it allowed me to focus on developing an intuitive and aesthetically pleasing design. The project structure includes separate packages for the user interface, data management, and business logic, adhering to the principles of modular programming.

User Interface Design

Main Dashboard

The main dashboard serves as the primary interface, showcasing various travel options and features available to users. Key elements of this screen include:

- **Logo and Title**: The travel agency's name and logo are prominently displayed at the top, establishing brand identity and ensuring immediate recognition.

- **Navigation Bar**: A horizontal navigation bar includes links to various sections: Home, Destinations, Bookings, and Contact Us, enabling easy navigation. The navigation items are styled for clarity and consistency, adhering to established web design principles.

- **Featured Destinations**: The dashboard includes a carousel of popular travel destinations, each featuring high-quality images, brief descriptions, and "Book Now" buttons. This interactive element captures user attention and encourages exploration.

- **Search Functionality**: A search bar at the top allows users to quickly find specific travel packages or destinations. Autocomplete suggestions enhance usability by predicting user input, reducing search time.

This design emphasizes the HCI principle of visibility, ensuring users can quickly access the information they need.

Booking Screen

The booking screen allows users to book travel packages. It includes several essential components:

- **Destination Selection**: A dropdown menu for users to choose from available travel destinations. This menu dynamically updates based on the selected category (e.g., beach, mountain, cultural).

- **Date Picker**: An integrated calendar interface allows users to select travel dates easily. This functionality improves user experience by providing an intuitive and visually appealing way to choose dates.

- **User Information Form**: A structured form with fields for entering user details such as name, email, contact number, and special requests. Tooltips provide additional information, guiding users through the input process.

- **Submit Button**: Initiates the booking process, along with confirmation prompts. Upon submission, the system confirms the booking and provides a summary for review before final confirmation.

This screen focuses on user control and freedom, allowing users to make informed decisions easily.

Contact Us Page

The Contact Us page provides users with various ways to reach the agency. Key components include:

- **Contact Form**: A comprehensive form for users to submit inquiries, with fields for name, email, subject, and message. Input validation ensures that users provide necessary information, enhancing communication efficiency.

- **Contact Information**: Displays the agency's phone number, email address, and physical address, facilitating easy communication. Social media links encourage users to connect through preferred channels.

The design reflects the principle of error prevention, ensuring users can easily provide feedback or ask questions without confusion.

Error Handling and Input Validation

Error handling is integral throughout the application. In the booking screen, if users attempt to submit the form with missing fields, an error message appears, informing them of the required fields. Each error message is context-sensitive and provides clear guidance on how to rectify the issue.

Additionally, input validation is implemented for email fields and date selections to ensure proper formatting and logical consistency. For example, the system prevents users from selecting past dates for travel, enhancing the overall robustness of the application.

Dummy Functionality Stubs

To focus on user interface design, I incorporated dummy functionality stubs. For example, after clicking the "Book Now" button, a pop-up appears stating, "Booking functionality coming soon!" This approach allows me to demonstrate the interface's design while postponing backend functionality development.
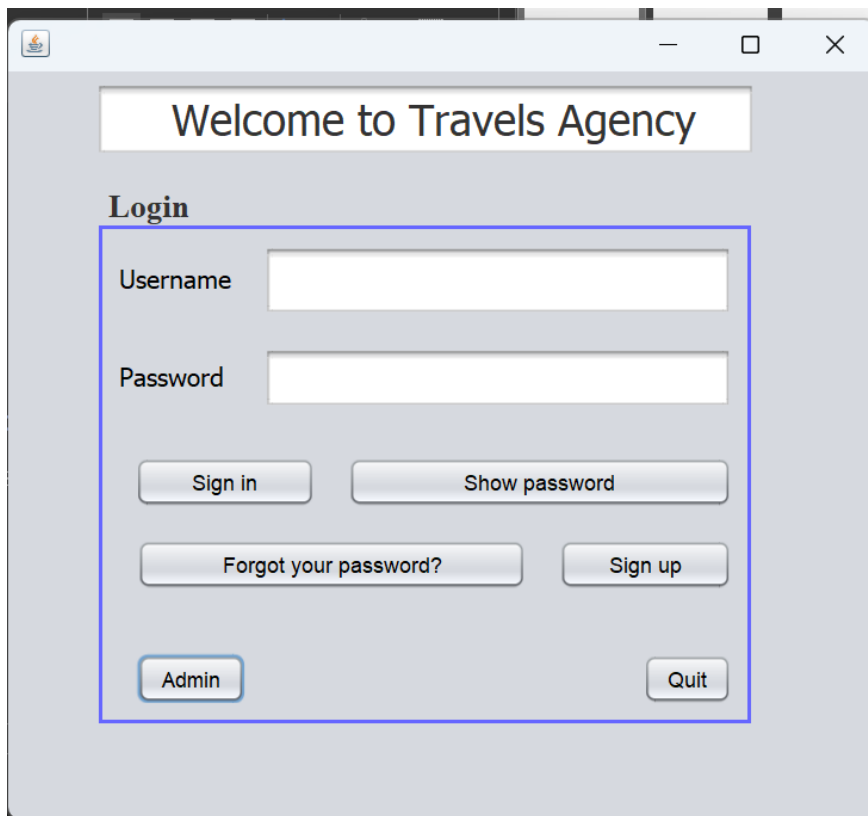
Robustness and Defaults

The interface is designed with robustness in mind. The application can handle unexpected inputs gracefully, such as providing descriptive error messages when a user submits an incomplete form. Default values are set for user information fields, ensuring a smoother experience upon initial use.
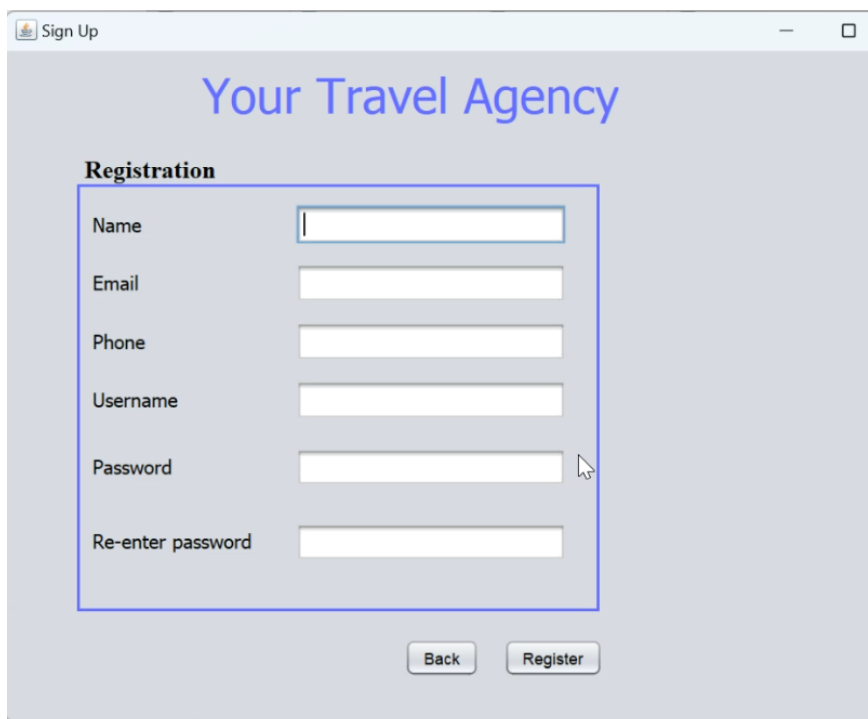
Implementation Technologies

The Travel Agency System was developed using the following technologies:

- **Java**: The primary programming language for developing the application, leveraging object-oriented principles for maintainability and scalability.

- **Java Swing**: Utilized for building the graphical user interface, providing a comprehensive set of components for creating a rich user experience.

- **NetBeans IDE**: The development environment used for coding, debugging, and testing the application, facilitating an efficient development process.
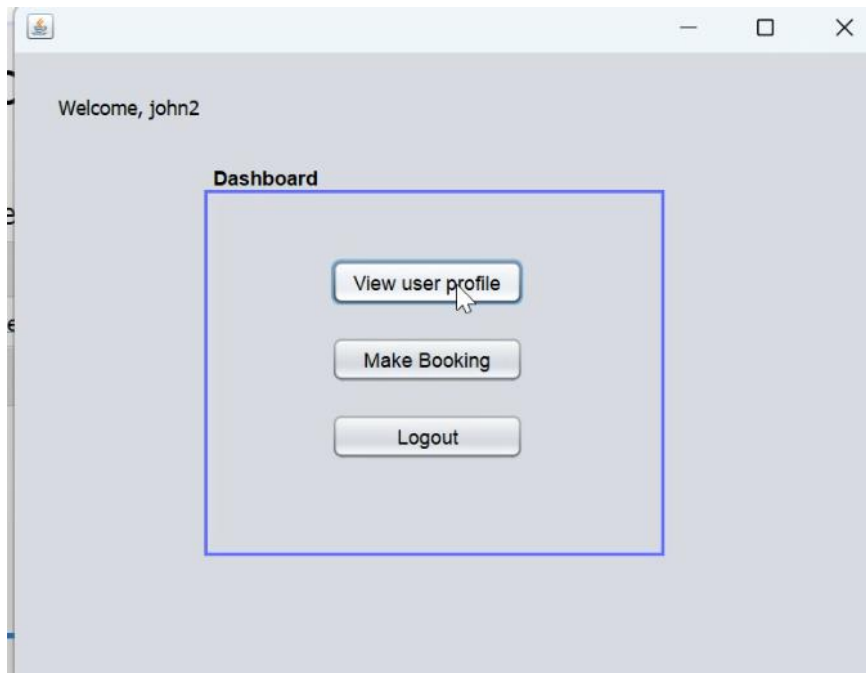

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Login Page

Sign up Page

Dashboard

User Profile

Make Booking – Selection Destination
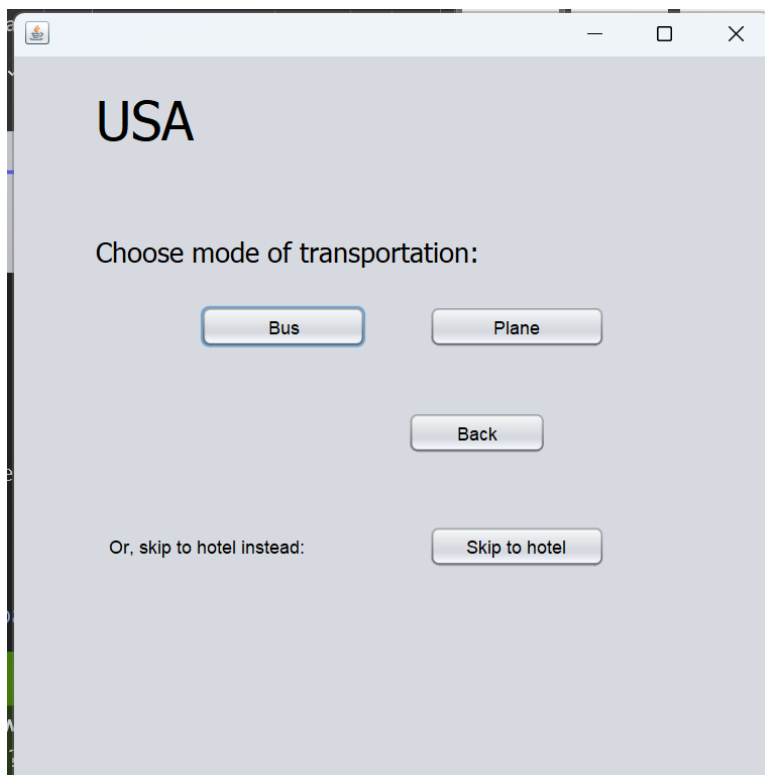
Select mode of Transport

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Select Airlines

Choose Seat

Booking

Name	john2
Destination	USA
Type	Air
Company	Alaska Airlines
Seatno	Econ-B2
Cost	5000

Back to main   Confirm

Confirm Booking

Your booking has been confirmed!

Continue to hotels   Finish

Rate your booking experie...   Rate us! ▼

Rate us!
5
4
3
2
1

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Heuristic Principles and Findings

Here are Nielsen's 10 usability heuristics along with the corresponding feedback from the evaluation:

User Feedback Table for User 1

Question	Response
How easy was it to navigate through the system?	"I found it very easy to navigate. The layout is clean, and the menu items are well labeled."
Did you encounter any issues while making a booking?	"No, the booking process went smoothly without any issues."
How clear were the available travel options?	"The travel options were displayed clearly, and I appreciated the filtering options."
Would you recommend any changes to improve the system?	"Adding a search bar would be beneficial for quickly finding specific destinations."

User Feedback Table for User 2

Question	Response
How easy was it to navigate through the system?	"The navigation was somewhat confusing at first. I had to look for a while to find certain features."
Did you encounter any issues while making a booking?	"Yes, I had trouble selecting the dates; the calendar interface could be more user-friendly."
How clear were the available travel options?	"They were clear, but I would like to see more details about each option before I select."
Would you recommend any changes to improve the system?	"I think a tutorial for first-time users would really help understand how to use the system."

User Feedback Table for User 3

Question	Response
How easy was it to navigate through the system?	"Overall, it was easy to navigate. I quickly found the features I needed."
Did you encounter any issues while making a booking?	"I did face a minor issue with payment processing; it took longer than expected."

How clear were the available travel options?	"The travel options were displayed well, but more images would enhance the experience."
Would you recommend any changes to improve the system?	"I think incorporating user reviews or ratings for travel packages would be a great addition."

1. Visibility of System Status

Definition: The system should always keep users informed about what is going on through appropriate feedback.

- Findings: Users appreciated the immediate feedback provided upon submitting forms, such as confirmation dialogs. However, they suggested adding loading indicators for processes that may take longer, such as when accessing external resources or loading data.

2. Match Between System and Real World

Definition: The system should use language and concepts familiar to the user, following real-world conventions.

- Findings: Users found the terminology easy to understand and felt it matched their expectations for a travel booking system. However, some suggested including a glossary for less common travel terms to help unfamiliar users.

3. User Control and Freedom

Definition: Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue.

- Findings: Users appreciated the ability to navigate back and forth between screens and to cancel actions easily. However, they expressed a desire for an "Undo" option for accidental submissions, particularly in the booking process, where users might need to revise their input.

4. Consistency and Standards

Definition: Users should not have to wonder whether different words, situations, or actions mean the same thing.

- Findings: The application maintained consistent terminology and design elements across different screens, which users noted as a strength. However, some inconsistencies in button styles and hover effects were pointed out, suggesting a need for uniformity.

5. Error Prevention

Definition: Even better than good error messages is a careful design that prevents a problem from occurring in the first place.

- Findings: Users appreciated the system's proactive error prevention measures, such as guiding them to complete necessary fields before submission. However, they suggested providing more specific error messages to clarify the issues encountered, such as indicating which fields are missing or incorrectly filled.

6. Recognition Rather Than Recall

Definition: Minimize the user's memory load by making objects, actions, and options visible.

- Findings: Users found the autocomplete feature in the search bar beneficial, enhancing usability. Some suggested expanding this feature to include suggested travel packages based on popular searches.

7. Flexibility and Efficiency of Use

Definition: The interface should cater to both inexperienced and experienced users, allowing them to tailor frequent actions.

- Findings: While users found the interface easy to navigate, they expressed interest in features that could enhance efficiency, such as bookmarking options for frequently searched destinations.

8. Aesthetic and Minimalist Design

Definition: Dialogues should not contain irrelevant or rarely needed information.

- Findings: Users appreciated the clean design, which avoided unnecessary clutter. However, they suggested the addition of visual hierarchy elements, such as font weight or color differentiation, to emphasize important information.

9. Help Users Recognize, Diagnose, and Recover from Errors

Definition: Error messages should be expressed in plain language, precisely indicate the problem, and constructively suggest a solution.

- Findings: While error messages were present, users felt they could be more specific, providing detailed guidance on how to resolve issues. For example, indicating which fields are incorrectly filled or missing.

10. Help and Documentation

Definition: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation.

- Findings: Users noted the absence of a help section or documentation, which could aid in understanding the system's features and processes. They recommended creating a dedicated help page with FAQs and contact options for support.

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Evaluation Summary

Heuristic	Feedback	Severity Rating (1-4)
Visibility of System Status	Suggestion for loading indicators	2
Match Between System and Real World	Glossary needed for uncommon travel terms	2
User Control and Freedom	"Undo" option for accidental submissions	3
Consistency and Standards	Inconsistencies in button styles	2
Error Prevention	More specific error messages needed	3
Recognition Rather Than Recall	Expand autocomplete for suggested travel packages	2
Flexibility and Efficiency of Use	Bookmarks for favorite destinations	3
Aesthetic and Minimalist Design	Need for visual hierarchy elements	2

Recommendations

Based on the heuristic evaluation findings, I propose the following recommendations for future improvements:

1. **Loading Indicators**: Implement loading indicators to inform users about ongoing processes, particularly for data-intensive actions.

2. **Glossary Addition**: Include a glossary or help section to define less common travel terms and concepts for users unfamiliar with industry jargon.

3. **"Undo" Option**: Introduce an "Undo" option for users to reverse accidental actions, particularly in the booking process.

4. **Uniformity in Design**: Standardize button styles, hover effects, and other UI components to enhance consistency across the application.

5. **Enhanced Error Messaging**: Improve error messaging by providing specific feedback on form input errors, indicating which fields require attention.

6. **Autocomplete Expansion**: Expand the autocomplete feature to include suggested travel packages based on common user queries.

7. **Bookmarking Features**: Develop bookmarking functionality to allow users to save favorite destinations and packages for quick access.

8. **Visual Hierarchy Elements**: Introduce visual hierarchy elements such as varying font weights or colors to highlight important information within the interface.

Conclusion

The Travel Agency System effectively demonstrates the principles of user-centered design and usability in its implementation. The project meets its primary objectives of creating an interactive platform for travel bookings while adhering to fundamental HCI principles. Through heuristic evaluation, I identified both strengths and areas for improvement within the application. By implementing the recommended enhancements, the system can achieve even higher usability standards, ultimately leading to a better user experience.

This project not only reinforces my technical skills in Java programming and UI design but also deepens my understanding of usability principles essential for developing interactive systems. As I continue to refine my skills in software development, I aim to incorporate user feedback and evaluation methods consistently, ensuring that future projects align with best practices in HCI.

Video

https://youtu.be/MbHmdHQpNdE

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