Review Article

Hotel Administration Application Design Using Delphi and UI/UX Designer

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Abstract: The need for attractive and interactive Web Design is the dream of all service providers to get more customers. However, building the UI / UX Design requires software that can collaborate with the database, as well as having an interactive and attractive design, one of the software desired by Web Developers is Open-Source and can be developed for free and can be developed freely by the Web developer community. As developed here is using the Penpot App. In the Penpot App, we can build a Web design that is used as an easy display for web developers such as Layers and Assets. These layers talk about the appearance that will be used or the layout of some of the required components, while these Assets contain all Web components that can be dragged and dropped on the web layer that is being and will be built. Another component is Design and Prototype, these two components are to choose the right design as used to build the Hotel Website. In this Design we can use a Canvas background to determine the right color, hopefully with the UI/UX Designer use of Penpot can be perfect and follow the expectations of making the Hotel website, so that the percentage of visitors can increase by seeing the performance of the website built, other than UI/UX Designer. And administration system can use the Graphical User Interface Delphi by using the latest version.

Keywords: UI/UX designer; Web designer; Web developer; Open source web; Web component; Borland Delphi

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1. Introduction

Website-based systems, currently continue to grow rapidly, especially for UI / UX Design for interactive and attractive websites. Websites that do not have components such as UI/UX designers [1,2,3,4] are classified as unattractive websites, so getting potential customers or visitors will be very difficult. Now the website is combined with various tools and databases that are easy to integrate and develop. Moreover, using open source applications. In the case of this article, we will try to build a Website-based system using Penpot App. From this UI/UX Design Application we will build all the components needed to organize and create a web design for Hotel. Some things that need to be built besides design are connectivity with databases. The three main components in building a complete website are frontend, backend, and databases. Frontend includes HTML, CSS, JavaScript, and frameworks such as React, Vue.js, and Angular. The backend includes Server-side scripting languages (PHP, Python, Ruby, Node.js), frameworks (Express.js, Django, Laravel). and Databases used include SQL databases (MySQL, PostgreSQL), NoSQL databases (MongoDB, Firebase). In the case study of booking hotel rooms through the website that we will build, there are 2 essential parts, namely the Booking Form and the room page, in the booking form there are components including the name and date of booking, then these 2 parts are stored in the database, then in the room section, information in the room section includes price information, room photos, and a complete and comprehensive description.

Other components include forms for ordering and price checkout and the payment process, what needs to be emphasized again here is the payment factor or code for making payments that can be connected to the bank to be addressed.

2. Theory

2.1 Background Color on Website

One of the essential components of building a web design is the accuracy or suitability of colors. So it is necessary to understand in detail the coloring and code used to build an attractive and interactive website. Figure 1 shows the use of color based on the color code and is also shown in the background color directly to simplify and speed up the process of making UI/UX design on the website that we will build. To find out the complete background, you can use the various options like the circle in Figure 2.

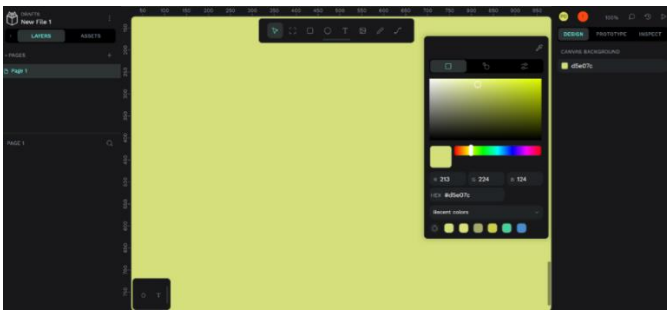

Figure 1. Start Coloring on the Background using Penpot UI/UX Designer

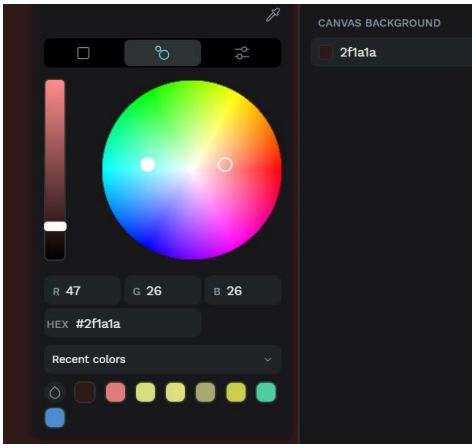

Figure 2. Choose a more complete range of other background colors on Penpot UI/UX Designer

2.2 Components of UI/UX Website Design

An essential component of UI/UX Design App [5,6,7,8,9]. This is how we can be creative using all the components provided in the UI/UX Design App. Which is combined with all the needs of research. For example, for a hospitality website. We can freely arrange rectangles or squares with the right size, as shown in Figure 3. Moreover, Figures 1, 2, and 3 are examples of making App design, this paper does not discuss in detail, the concept and how to connect with the database, UI / UX Design [10,11,12,13,14,15,16], and also some other essential parameters. In detail can be seen in the Block Diagram.

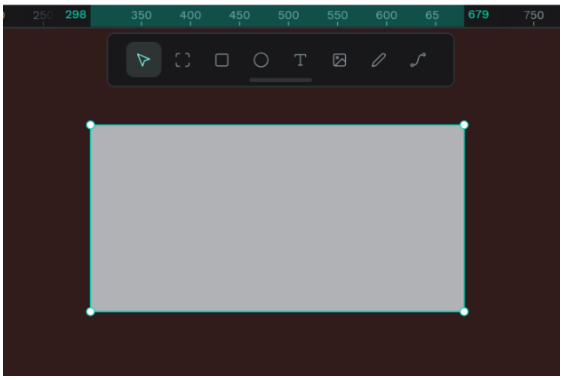

Figure 3. Using Rectangle in UI/UX Design App.

Furthermore, in designing UI/UX Design for a Website, we need to look at many factors, including equations such as scaling, padding, margins, color theory, and Typography. We can calculate it with the following equations 1 to 12.

$$Column\ Width = \frac{Container\ Width}{Number\ of\ Columns} \quad (1)$$

For example, Column Width is $\frac{1200\ px}{12} = 100\ px$.

The next component is Gutter, we can use the formula for Column Width with Gitter, as in equation 2.

$$Column\ Width = \frac{Container\ Width - (number\ of\ Column - 1)x\ Gutter\ Width}{Number\ of\ Columns} \quad (2)$$

Next is Aspect Ratios, we can use formula 3, the aspect ratio is a proportion element, and we can call it a pixel comparison. For example, an aspect ratio of 400 px/300 px is 4:3.

$$Aspect\ Ratio = \frac{Width}{Height} \quad (3)$$

Meanwhile, responsive design is used to maintain the aspect ratio in responsive design, as shown in Formula 4.

$$Height = \frac{Width}{Aspect\ Ratio} \quad (4)$$

Furthermore, Typography is a Line Height that shows help so that those who enter the Website will easily understand the design very well. Letter spacing is used for the space between characters, as shown in the formula 6 equation.

$$Line\ Height = font\ size\ x\ Line\ Height\ Ratio \quad (5)$$

$$Letter\ Spacing = \frac{Total\ Width\ of\ Text - (Number\ of\ Characters\ x\ Character\ Width)}{Number\ of\ Characters - 1} \quad (6)$$

The next formula is Contract Ratio, which is used so that text and other components can be read well, including the Background. The formula is as in equation 7.

$$Contrast\ Ratio = \frac{L1 + 0.05}{L2 + 0.05} \quad (7)$$

Besides Contrast, there is Luminance, for example, in RGB, we use formula 8.

$$L = 0.2126\ x\ R + 0.7152\ x\ G + 0.0722\ x\ B \tag{8}$$

Meanwhile, the formula for responsive design, which is the viewport used for responsive design, uses formulas 9 and 10.

$$vw\ (viewport\ width)\ :\ 1vw = 1\%\ of\ viewport\ width \tag{9}$$

$$vw\ (viewport\ height)\ :\ 1vh = 1\%\ of\ viewport\ height \tag{10}$$

The next component is the Scaling Factor which is an essential component, as shown in equation 11.

$$Scaled\ Size = Original\ Size\ x\ Scaling\ Factor \tag{11}$$

And another important component as shown in equation 12 is Padding and Margin. To calculate the component element of padding and border, you can use equation 12. For example, the Total Width is 200 px + 10 px + 10 px + 2 px + 2 px = 224 px

$$Total\ Width = Content\ Width + Left\ Padding + Right\ Padding + Left\ Border + Right\ Border \tag{12}$$

3. Method

The complete design built using the UI/UX Design App can follow the Flowchart in Figure 4. This is the design that will be built.

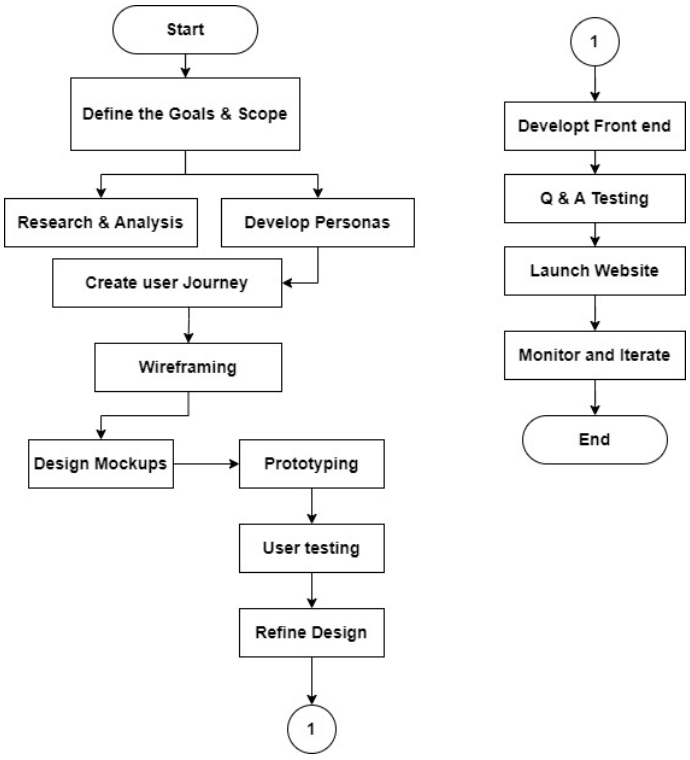

Figure 4. Using Rectangle in UI/UX Design App.

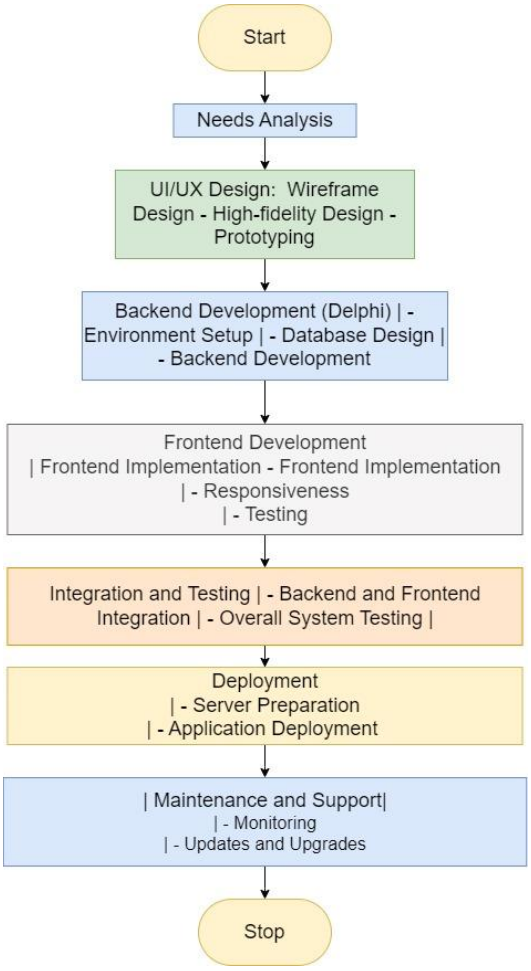

Figure 5. Website Development based on UI/UX Designer

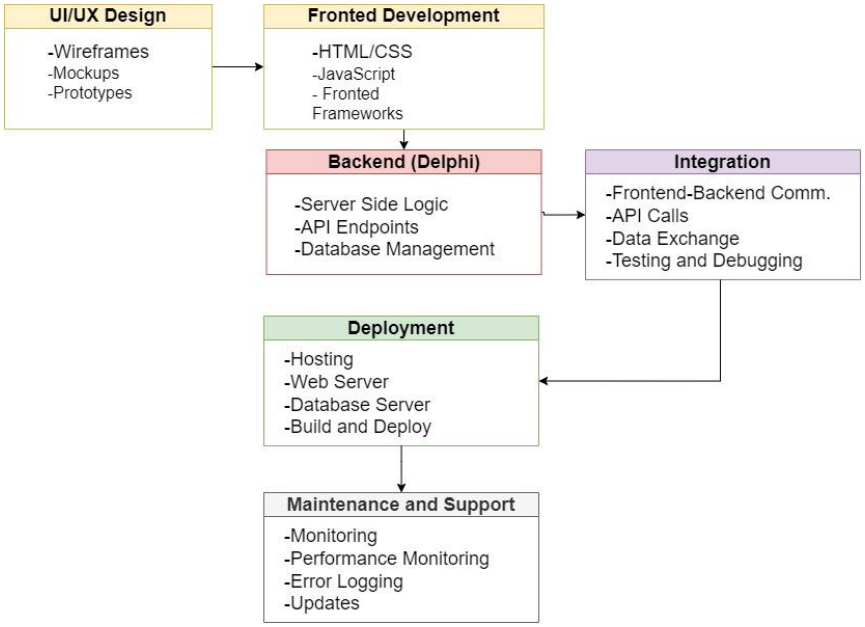

Figure 6. Block Diagram Component in building Web-based on UI/UX Designer and Delphi

Figure 4 shows the details of the Website system built, using UI/UX Design, starting from the initial goal to the end, there are analyses and also several components such as Design Mockups and Prototyping. Finally the Website Launching and also the monitoring system. This monitoring is useful if there are errors in the website design that was built, can fix it again. While Figure 5 is the development of a UI/UX Design-based system, this system shows a detailed analysis of UI/UX Design, building a backend system, database, and backend management, on the frontend, there is frontend implementation, responsiveness, and testing, as well as deployment, server preparation, application deployment, maintenance, monitoring, updates, and upgrades.

Moreover, while Figure 6 is the important components of UI/UX Design, namely Wireframes, Mockups, and Prototypes, the development uses HTML/CSS, JavaScript, Fronted, and Frameworks, while the backend (Delphi) such as Server Side Logic, API Endpoints, and Database Management, the integration system, using Frontend-Backend Comm, API Calls, Data Exchange, and Testing and Debugging, then the Deployment process is Hosting, Web Server, Database Server, and Build and Deploy, while Maintenance and support consist of System Monitoring, Performance Monitoring, Error Logging, and Updates.

4. Discussion

Some essential parts in the process of designing a hotel room booking website based on UI / UX design [17,18,19,20], we see from several main components, namely Header, Hero Section, Room, Booking, and Footer. In this section, we will discuss XML code comprehensively and make buttons to be able to navigate appropriately, as well as a combination of colors that can provide attractiveness for customers. The 2 main parts that need to be managed are the design side, and also databases, for example using HTML, XML, CSS, and other components that are connected to MySQL databases for example, and a detailed and thorough connection between tables is needed. In this section, we will discuss each component along with the programming language or coding program used to create a hotel room booking web design.

Moreover, In this discussion, we will discuss in detail, components using Pseudocode UI/UX Designer in building a Hotel Room Booking Website. Some of the components that we will discuss include the home Page - Hotel Search Page - Hotel Detail Page - Booking Form - Booking Confirmation Page - Login/Registration Page, and - My Bookings Page.

```
BEGIN
    DISPLAY header with navigation bar (Home, Search Hotels, My
Bookings, Login)
    DISPLAY welcome message
    DISPLAY search bar with fields for location, check-in date,
check-out date, number of guests
    DISPLAY featured hotels or promotions
    IF user is logged in
        DISPLAY user profile link
    ELSE
        DISPLAY login/register button
    END IF
    DISPLAY footer with contact information and links to privacy
policy, terms of service
END
```

---------- Home Page Pseudocode ----------

```
BEGIN
   IF search form is submitted
      VALIDATE input fields (location, check-in date, check-out
date, number of guests)
      IF input is valid
         PERFORM search query in database
         DISPLAY search results with hotel listings
            FOR each hotel
               DISPLAY hotel name, image, rating, price, and brief
description
               PROVIDE "View Details" button
            END FOR
         DISPLAY pagination controls
      ELSE
         DISPLAY validation error message
      END IF
   END IF
END
```

---------- **Hotel Search Page Pseudocode** ----------

```
BEGIN
    IF user selects a hotel from search results
        RETRIEVE hotel details from database
        DISPLAY hotel name, images, detailed description, room types,
amenities, and pricing
        DISPLAY availability calendar with selectable dates
        DISPLAY "Book Now" button
    END IF
END
```

---------- **Hotel Detail Page Pseudocode** ----------

```
BEGIN
    IF user clicks "Book Now"
        DISPLAY booking form with fields for personal details (name,
email, phone number)
        DISPLAY booking summary (room type, check-in/check-out dates,
total price)
        DISPLAY "Confirm Booking" button
        IF form is submitted
            VALIDATE input fields (personal details, payment
information)
            IF input is valid
                PROCESS payment
                SAVE booking details in database
                SEND confirmation email to user
                DISPLAY booking confirmation page with booking details
            ELSE
                DISPLAY validation error message
            END IF
        END IF
    END IF
END
```

---------- **Order Form Pseudocode** ----------

```
BEGIN
   IF booking is confirmed
      DISPLAY booking reference number
      DISPLAY booking details (hotel name, room type, check-
in/check-out dates)
      DISPLAY thank you message
      PROVIDE link to download booking confirmation or view in PDF
format
   ELSE
      DISPLAY error message if booking failed
   END IF
END
```

----------Order Confirmation Page Pseudocode -------------

```
BEGIN
   IF user clicks "Login" or "Register"
      DISPLAY login/registration form
         FOR login
            PROVIDE fields for username/email and password
            DISPLAY "Login" button
            IF form is submitted
               VALIDATE credentials
               IF credentials are valid
                  AUTHENTICATE user
                  REDIRECT to homepage or previous page
               ELSE
                  DISPLAY error message
               END IF
            END IF
         FOR registration
            PROVIDE fields for username, email, password, confirm password
            DISPLAY "Register" button
            IF form is submitted
               VALIDATE input fields
               IF input is valid
                  CREATE user account
                  SEND verification email
                  DISPLAY registration success message
               ELSE
                  DISPLAY error message
               END IF
            END IF
   END IF
END
```

----- Registration/Login page Pseudocode-------

```
BEGIN
   IF user is logged in
      RETRIEVE user's booking history from database
      DISPLAY list of past and upcoming bookings
      FOR each booking
         DISPLAY booking details (hotel name, room type, check-
in/check-out dates, status)
```

```
            PROVIDE option to cancel or modify booking (if applicable)
        END FOR
    ELSE
        DISPLAY message prompting user to log in
    END IF
END
```

----------My Booking Page Pseudocode ----------

Pseudocode-Pseudocode shows specifically the components needed in building a UI/UX Design-based Website, starting from Home Page Pseudocode, Hotel Search Page Pseudocode, Hotel Detail Page Pseudocode, Order Form Pseudocode, Order Confirmation Page Pseudocode, Registration/Login page Pseudocode, and My Booking Page Pseudocode.

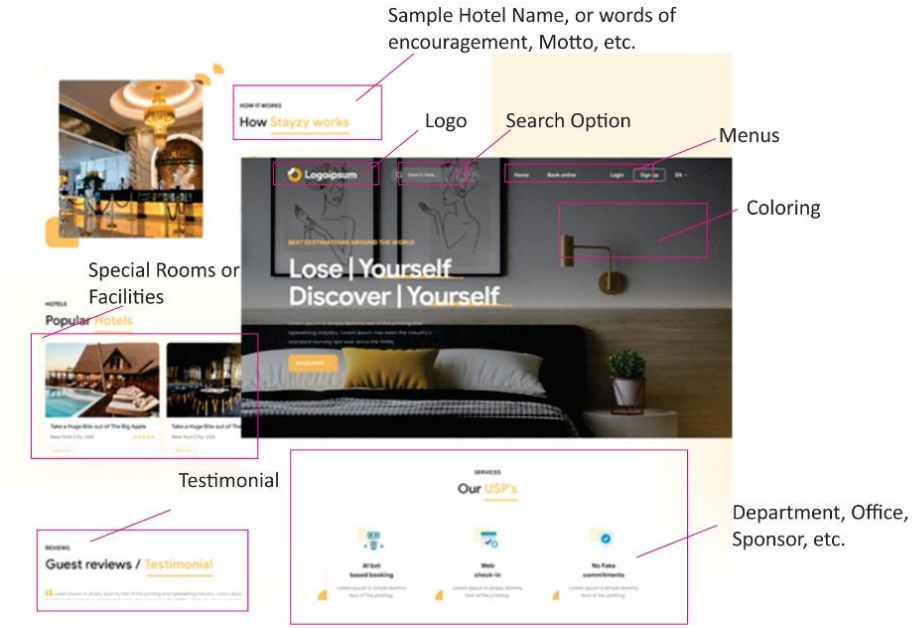

Figure 7. Design Example for Hotel using UI/UX Designer and Component from Dribble

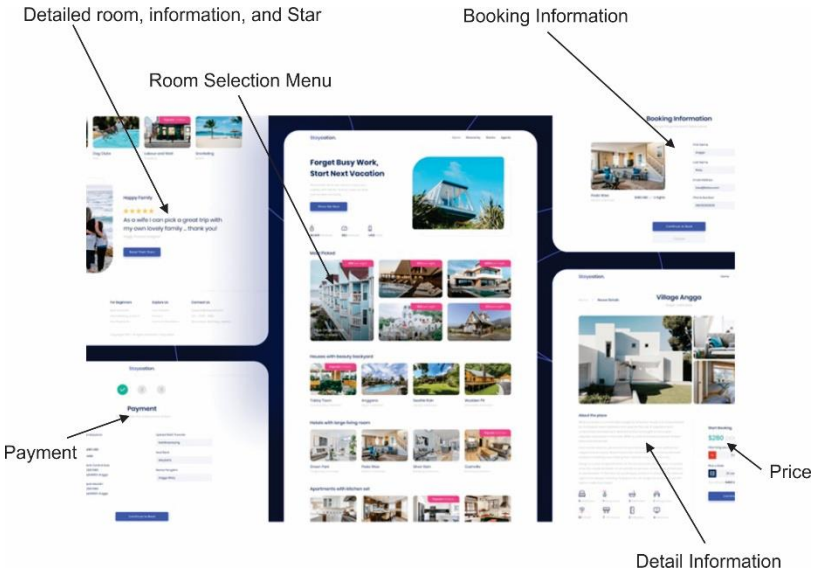

Figure 8. Various examples of Hotel room booking interface using UI/UX Designer

5. Conclusion

Hotel booking websites designed by UI/UX Designers generally have a responsive and intuitive interface. A good design ensures that users can easily navigate the site, find the necessary information, and complete the booking process without any confusion. UI/UX Designer focuses on visual consistency and functionality across website pages. This includes the consistent use of colors, typography, and design elements, which helps users feel more comfortable and familiar with the interface. Websites with good UI/UX design tend to result in higher user satisfaction levels. The effective design reduces friction in the user experience and allows users to complete tasks, such as hotel reservations, more efficiently. Good design often gets positive feedback from users, including better reviews and ratings. Users appreciate a clean interface, easy navigation, and a booking process.

6. Suggestion

To maximize the benefits of UI/UX design on hotel booking websites, it is recommended to Continuously Improve Based on Feedback: Always collect feedback from users and iterate the design based on it to improve the user experience. Use Data Analytics: Monitor performance metrics such as conversion rate, time spent on site, and bounce rate to gauge the effectiveness of the design and make necessary adjustments. Focus on Accessibility: Make sure the website is accessible to all users, including those with special accessibility needs, to ensure an inclusive experience.

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