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User-Centered UX/UI Design of a Mobile Flight Search Application

ABSTRACT

The growing adoption of mobile applications has transformed access to travel-related services, increasing the demand for intuitive and clearly structured digital products. This paper presents a user-centered UX/UI design process for a mobile flight search application prototype. The research combined an analysis of existing flight search platforms with two surveys conducted at different stages of the design process. The first survey comprised 24 questions and involved 50 respondents. It examined travel habits, expectations of flight search services and preferences regarding the presentation of information, informing functional requirements and a low-fidelity prototype. The second survey comprised 20 questions and involved 35 respondents. It examined preferences for navigation, interface components, colour palettes and typography, guiding the high-fidelity prototype developed in Figma. In the first survey, 48 of 50 respondents rated information clarity as important or very important, and 46 assigned these ratings to the visibility of additional costs. In the second survey, 28 of 35 respondents preferred bottom navigation and 24 preferred colour changes as button feedback. The resulting prototype combines persistent navigation, structured flight information, card-based results and consistent visual components across search, booking and ticket management screens. The findings support an emphasis on clear information architecture and restrained visual complexity within the surveyed samples. They provide a traceable rationale for interface decisions, while improvements in task performance, satisfaction and cognitive load remain to be established through task-based usability testing. The case study illustrates how staged preference research can inform the design of travel-related mobile applications.

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KEY WORDS
User experience, user interface, mobile application, flight search, user-centered design

1. Introduction

Flight search interfaces must communicate several interdependent choices within a small display: origin and destination, travel dates, connections, schedules, fares and optional services. A visually simple screen is insufficient if users cannot identify the information needed to compare offers or understand the consequences of a booking decision. The design problem therefore concerns both the organisation of the search process and the visual presentation of its individual steps.

Human-centred design provides a framework for considering users throughout the development of interactive systems (International Organization for Standardization, 2019). For flight search, this raises a practical question: how can reported user needs and interface preferences be translated into a coherent mobile prototype? The present paper addresses this question through a mobile flight search application prototype, connecting two stages of survey research to the resulting information architecture and visual design.

2. Methods

2.1. Study design and research context

The process comprised an examination of existing services, a first user survey, the definition of user needs and a representative persona, low-fidelity prototyping, a second survey of interface preferences, and high-fidelity prototyping. Wizz Air, eSky, Kiwi and Skyscanner were examined as reference services. Their interfaces informed the exploration of search, booking and information presentation. This examination supplied design context rather than a controlled benchmark or a ranking of current commercial products.

2.2. Survey instruments and respondents

The first questionnaire contained 24 questions organised into three parts: demographics; travel habits and experience with flight search services; and ratings of existing website displays. It included categorical choices, five-point ratings and an open question about sources of dissatisfaction. The second questionnaire contained 20 questions. Five concerned demographics and mobile use, while 15 examined preferences for navigation, feedback, content organisation, visual emphasis, notifications, colour, typography and icons.

Table 1 summarises the samples. The first survey included 50 respondents and the second 35. Recruitment procedures and respondent overlap between stages were not documented sufficiently to support a longitudinal analysis. Consequently, the surveys are treated as separate descriptive datasets, and their sample sizes are not added to infer a number of unique participants.

Table 1
Sample characteristics and questionnaire scope

Characteristic	Survey 1	Survey 2
Number of respondents	50	35
Number of questions	24	20
Women, n (%)	40 (80.0)	26 (74.3)
Men, n (%)	10 (20.0)	9 (25.7)
Aged 18–25, n (%)	43 (86.0)	33 (94.3)
Aged 26–45, n (%)	6 (12.0)	1 (2.9)
Aged 46–65, n (%)	1 (2.0)	1 (2.9)

2.3. Analysis and prototyping

Responses were analysed descriptively using reported frequencies and percentages. Percentages in the tables are recalculated from documented counts and rounded to one decimal place; totals may differ slightly from 100% due to rounding. For selected five-point importance items, ratings of 4 and 5 are combined explicitly.

The first survey guided the functional structure and low-fidelity screens. The second informed visual and interaction choices in the high-fidelity Figma prototype. The logo was created in Adobe Illustrator. No controlled task experiment, performance baseline or standardised post-use usability score was made. The output is therefore an interactive design prototype, without demonstrated airline inventory, payment or check-in system integration.

3. Results

3.1. Flight search needs and information priorities

The first survey identified information visibility and control over bookings as prominent concerns. On the five-point scale, where 1 indicated “not important at all” and 5 “very important”, 42 respondents selected 5 and 6 selected 4 for information clarity. For clearly displayed additional costs, 34 selected 5 and 12 selected 4. For a cancellation option, the corresponding counts were 26 and 14. Table 2 reports these combined ratings alongside selected categorical responses.

Table 2
Selected requirements from Survey 1 (n = 50)

Requirement or preference	Response criterion	n	%
Clear presentation of information	Rating 4 or 5	48	96.0
Visible information on additional costs	Rating 4 or 5	46	92.0
Option to cancel a booking	Rating 4 or 5	40	80.0
Availability on multiple platforms	Selected preference	37	74.0
Availability in Serbian and English	Selected preference	36	72.0
Notifications of flight price changes	Positive response	44	88.0
Discounts for regular users	Positive response	45	90.0

These responses support treating essential information as a primary design requirement. In particular, clarity should include the visibility of costs that may alter the apparent attractiveness of a fare. Cancellation is a related control requirement: users need

to find the relevant action and understand its conditions. The data establish the importance respondents attached to these features, rather than the effectiveness of any particular implementation.

When asked which listed flight search service they used most frequently, 27 respondents selected Wizz Air (54.0%), ten Skyscanner (20.0%), two eSky (4.0%) and two Kiwi (4.0%); nine selected non-use (18.0%). These figures describe the sample's choices among the offered categories. They do not estimate market shares. The inclusion of non-users also means that expectations of flight search should not be interpreted as evaluations based uniformly on extensive experience.

Open responses described problems with organisation and the visibility of relevant information. Among the requested improvements were clearer cancellation options and a calendar that makes prices easier to inspect. These comments were used as qualitative design input; no formal coding scheme or theme frequency analysis was documented. In the flight-choice importance item, 25 respondents assigned the highest rating to the number of connections, providing a reason to make connection information easy to locate during comparison.

3.2. From requirements to a low-fidelity structure

The requirements were translated into a sequence covering search, comparison, flight details, booking and subsequent ticket management. A representative persona and a user journey were constructed to support design decisions. The persona was a design aid rather than a statistically established user segment. Low-fidelity screens then defined the placement of controls and the links between screens before colour and typography were finalised.

The structure included entry and account screens, a home screen, flight search and results, flight details, booking steps, e-tickets, notifications and account settings. Ancillary choices such as insurance, baggage and seats were represented as successive booking steps, with access to further information. This creates an opportunity to explain optional services in context, although comprehension of those explanations requires subsequent observation of users completing booking tasks.

3.3. Interface preferences in the second survey

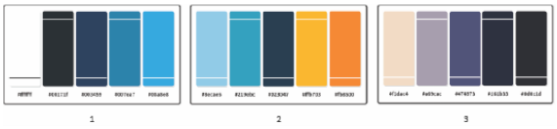
The second survey provided more specific input for navigation and visual components. Bottom navigation was selected by 28 of 35 respondents (80.0%), compared with seven who selected a side menu. Colour change was the preferred form of button feedback for 24 respondents (68.6%); seven selected a shadow and four selected a size or shape change. These responses guided the persistent bottom navigation and interactive button variants in the prototype.

Table 3

Selected interface preferences from Survey 2 (n = 35)

Interface decision	Preferred option	n	%
Primary navigation	Bottom navigation	28	88.0
Button feedback	Colour change	24	68.6
Content presentation	Cards with detailed information	19	54.3
Colour scheme	Palette 2	21	60.0
Body typeface	San Francisco	21	60.0
Emphasis typeface	Poppins	16	45.7
Icon style	Filled icons	19	54.3

For content presentation, 19 respondents preferred cards with detailed information, ten preferred an image-based presentation with minimal text, and six preferred a tabular presentation. Cards therefore received a narrow majority, rather than a unanimous preference. The layout adopted cards to group the attributes of each offer, while retaining textual details needed for comparison. The preference for clear separation of content sections further informed the organisation of the screens. Figure 1 shows the offered color palettes.



» **Figure 1:** *Color Palettes 1, 2 and 3*

Palette 2 was selected by 21 respondents (60.0%), compared with nine selecting Palette 1 and five selecting Palette 3. For body text, San Francisco received 21 selections, ahead of both Inter and Open Sans. For emphasis text, Poppins received 16 selections (45.7%), Inter 11 and Montserrat eight. Poppins was therefore the most frequently chosen option, but did not obtain an absolute majority. This distinction matters when describing the strength of the design rationale.

The difference between icon preferences was also small: 19 respondents selected filled icons and 16 selected outline icons. Filled icons were incorporated into the design, but this result does not justify a general claim that they are superior. Their interpretation still depends on the task, accompanying labels and the familiarity of individual symbols. A visual preference provides a starting point for design, not a substitute for checking whether users recognise a control.

3.4. Translating preferences into a visual system

Mobile flight search application prototype identity combined a cloud and aircraft symbol with a Montserrat wordmark. The application palette used blue tones as primary colours and yellow and orange as secondary accents, with black and white used for text and backgrounds. San Francisco was used for body text and Poppins for emphasis. Rounded buttons, grouped content and filled icons supplied a consistent set of visual elements across the main screens.

This translation was selective. Stronger preferences, such as bottom navigation, shaped the main interaction structure, while weaker differences, such as the filled-icon result, informed a provisional style choice. The design rationale is thus traceable without treating every selected option as an independently validated usability improvement. Consistency across screens is a design objective; its effects on learning and error rates were not measured in this study.

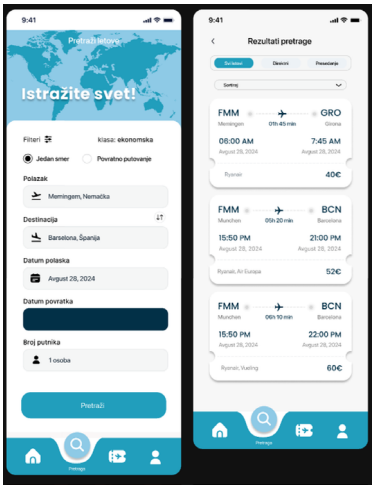
3.5. High-fidelity search and comparison screens

The high-fidelity prototype implemented the screen structure and visual choices in Figma. Its bottom navigation connects the home screen, flight search, e-tickets and profile. Secondary functions are available through additional menus and settings. The home screen contains destination and flight suggestions in card sections, and a notification entry provides access to updates. The presence of suggestions supports exploration, while the dedicated search section provides a direct route for users with a specific journey in mind.

Figure 2 shows the original search and results screens. The search form collects the journey type, origin, destination, dates and passenger information. The results screen groups flight attributes within cards and provides options for changing the presentation of results. In this arrangement, each offer has a recognisable visual boundary, supporting the intended comparison of route, time and price information. Screen content, dates and prices are illustrative prototype data.

The results screen operationalises the preference for cards, while the search form separates input choices from the comparison stage. This separation reduces the amount of content that must be presented at one time, but it also requires users to move between stages when revising a query. The design therefore creates a testable question: can users modify their travel criteria and compare alternatives without losing their place or overlooking a relevant fare condition?

The prototype retains a visually prominent header and destination imagery. Its interpretation of simplicity is therefore based mainly on grouping and hierarchy, rather than the complete removal of decorative content. Whether those elements help orientation or occupy space better used for fare information remains an issue for usability evaluation on mobile devices.



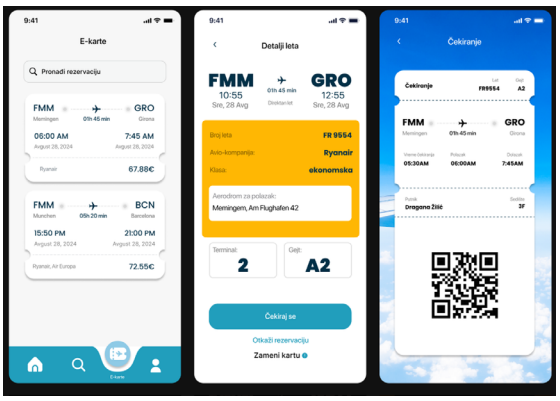
» **Figure 2:** *Search and results screens with the original Serbian interface*

3.6. Booking and ticket management

Selecting a flight opens its details and a route into booking. The represented sequence covers insurance, baggage and seat selection, passenger information, payment selection and confirmation. Supplementary information is accessible during relevant booking steps. These screens express the intended interaction flow; the prototype does not demonstrate real financial transactions or a live reservation service.

Figure 3 shows e-ticket access, flight details and the check-in representation. The e-ticket section presents booked flights and a search option. A selected flight leads to details with check-in, cancellation and ticket-change actions, followed by a screen containing a QR code. This sequence connects the search and purchase concept with later travel tasks. The QR code is part of the prototype visualisation and is not evidence of an operational boarding credential.

The notification and profile screens represent additional requirements from the first survey. Notifications provide a place for price and travel updates, while the profile includes collected points and available discounts. Such functions were motivated by stated interest in alerts and loyalty benefits. Their inclusion does not establish that respondents would enable notifications, return more often or complete more bookings in actual use.



» **Figure 3:** *E-ticket and check-in screens with illustrative booking data*

3.7. Interaction behaviour and implementation scope

Figma components and variants were used to define navigation states and button feedback. The bottom navigation remains fixed during scrolling and changes its active state between sections. Buttons change colour on interaction, while selection controls use a coloured outline. Centred overlays represent supplementary messages and can be dismissed by clicking outside them. The design also specifies transitions between screens, with 300 ms timing.

The implemented component behaviour makes the prototype suitable for examining screen-to-screen navigation. However, interface simulation does not establish the reliability of a deployed application. Price monitoring, multilingual content, cross-platform delivery, cancellation rules and payment processing would require further implementation and validation. The case study's result is the documented design and its interactive representation, rather than a production flight booking system.

4. Discussion

The main contribution is the explicit connection between two types of evidence and two levels of design. Survey 1 identified what respondents wanted to find or control, including prices, additional costs and booking changes. Survey 2 informed how the interface could present those functions, including navigation position, feedback and typographic choices. Treating these stages separately helps prevent a preferred visual treatment from being mistaken for a functional requirement.

The resulting emphasis on grouping, consistent components and visible feedback is compatible with established usability heuristics (Nielsen, 1994). In this case, however, that compatibility is an interpretation of the design, not the result of a formal heuristic evaluation. Similarly, participants' preference for an interface element cannot establish its effect on task performance. Nielsen (2001) stresses the importance of observing actual use when evaluating interfaces; this is the necessary next step for a mobile flight search application.

Several limitations restrict generalisation. Both samples were small and concentrated among respondents aged 18–25, with women forming the majority. Self-reported preferences may differ from behaviour during time-sensitive travel tasks. The study does not support inferential comparisons between demographic groups or an estimate of preferences among the wider travelling population.

A subsequent evaluation should observe participants searching for a specified route, comparing total costs, changing baggage choices and finding cancellation conditions. Completion rates, time, errors and post-task assessments could then be compared across design alternatives. Recruitment should include less frequent travellers and a wider age range. Accessibility checks should address text legibility, contrast, touch targets, motion and assistive technology support. Such work would test the expected benefits without assuming them from preference data.

5. Conclusions

Mobile flight search application prototype case demonstrates a structured way to translate flight search needs and interface preferences into an interactive mobile design. The first survey highlighted information clarity, visible additional costs and booking control; the second informed bottom navigation, button feedback, cards, colour and typography. The resulting prototype connects search, comparison, booking and ticket management through a consistent visual structure. These findings support the design rationale within the surveyed samples. Claims of improved usability, lower cognitive load or greater satisfaction require direct evaluation of the completed interaction flow.

6. Acknowledgment

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