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Gender-Inclusive User Interface Guidelines

Provided by

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Introduction

This document is based on the findings of our user study. It presents user interface (UI) design guidelines, interaction design guidelines, programming guidelines and booking application specific guidelines that we derived from these findings. All findings that could not be transformed into a specific guideline are listed in the policy guidelines section and are intended to facilitate decision finding for policy makers in governmental and non-governmental associations. The majority of our guidelines support established usability principles [5, 6] and guidelines / style guides (e.g., [1, 2, 4]), which we could additionally assign to specific gender attributes, based on our empirical data. In the following, we will define five terms that we use in our guidelines.

- **Widget:** A widget is a generic component of a graphical user interface (GUI). Examples are buttons, labels, date and time pickers.
- **Menu:** A menu is a widget that allows for the selection of a predefined set of values (e.g. drop-down widget for selecting a month).
- **Search Field:** A search field is a widget that allows for the input of characters (e.g. full-text search).
- **Mask:** A mask combines menus and search fields to collect specific data (e.g. payment information input at online shopping websites).
- **Navigation Bar:** A navigation bar is a special kind of menu that facilitates the navigation on a website.

For more information please visit our project website (`http://genuine.ict.tuwien.ac.at`).

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1 Design Guidelines

This section presents guidelines for interaction and UI designers. We put them together in the same chapter as interaction and UI design have a strong interplay.

1.1 Interaction Design Guidelines

- **Define the navigation clearly.** A clear navigation structure facilitates the user to orientate. The user should always know why and how s/he ended up where s/he currently is and what s/he can expect next. An example would be a stepwise structured booking process that could also be supported through a wizard.
- **Structure your interaction.** Make clear what belongs together. Navigating through your website will be "intuitive" for the user if your navigation structure reflects content relations clearly. An example is to collect all data that belongs together (e.g., personal information) in the same search mask instead of more than one.
- **Start with the essentials and end with the details.** For example, on booking websites ask for data related to *"when, where and who"* before asking about additional requirements like swimming-pool or sauna.

1.2 UI Design Guidelines

- **Structure your UI.** The use of your UI will be intuitive if its behavior matches the user's expectations. Make clear for the user which information belongs together (e.g., which information is sent by which button).
- **Place Menus on the left side of the UI.** The user expects a menu to be placed left-aligned in the UI.
- **Place search-fields/masks on top of the UI and/or centered.** The user expects search-fields/masks on top of the UI or additionally centered.
- **Place search results prominently.** It is important to place the search results prominently (i.e., on top of a new page, or immediately beneath the search field), so that the user finds them at once. Otherwise s/he will be confused and think that the system failed to process her request.
- **Place recurring widgets consistently.** Widgets that re-appear on different pages should be placed in the same position. Recurring structures boost a user's confidence, as s/he already knows how to handle them. Making incremental changes gradually leads the user from known to unknown issues and therefore does not demand much reorientation.
- **Provide a navigation bar, especially on mobile devices.** Mobile devices have a limited amount of screen real estate. Two-dimensional scrolling makes it difficult for the user to orientate because of her tunnel-view. Fitting large screens on small devices requires screen splitting. The evolving

navigation structure is deeper than the original one. This problem can be partly remedied through a navigation bar.

- **Use intuitive and consistent wording.** Ambiguity as well as inconsistency in wording can cause cognitive effort for the user. Therefore, use a clear and unambiguous terminology and do not change verbal labels for the same items or functions.
- **Use images.** The use of images leads to a positive user experience.
- **Use icons that are clear and easy to understand.** People can grasp the meaning of icons quicker than they can read words that convey the same meaning. Such icons must, however, be clear in what they convey, otherwise the lead to confusion and decrease the usability. It is also crucial that their style fits the overall visual style and content of your GUI.
- **Less is more.** Do not overload your UI regarding functionality, information and visual design. Using pictures, videos and sounds is tempting, as they typically lead to a positive user experience. Too much audio visual input, however, blurs the message that the website shall convey and deteriorates its usability.
- **Tailor the UI to the used device (e.g., desktop, tablet or smartphone).** Using websites that have been designed for high-resolution desktop PCs on smaller devices makes it hard for the user to orientate, because in order to read it, they have to navigate it scrolling in two dimensions (i.e., tunnel-view). Splitting pages remedies this problem. One dimensional scrolling on touch devices is fine, because the swiping gesture is part of such a UIs user experience.
- **Avoid scrolling on desktop UIs.** Scrolling is a physical and not very intuitive effort with a mouse device. Furthermore, the user might feel disoriented if widgets that s/he expects are not immediately visible.

2 Programmer Guidelines

The here presented guidelines for programmers are on a higher level of abstraction than source code and, therefore, language independent. They are on widget, rather than on code level and thus applicable in every programming language.

- **Make clear which input is processed with which action.** It is important to give the user feedback on whether her input data has been processed or ignored. If not all data is processed by a certain action it is vital to communicate the user which data has been processed and which not.
- **Make sure that all UI widgets work correctly on all supported devices.** Special widgets (e.g., calendar widget) shall be tested thoroughly before they are integrated. Mal- or non-functioning widgets seriously deteriorate the usability of websites, especially if they are required to perform recurring tasks (e.g., enter the date on a booking website).
- **Make page loading times for Web-pages as short as possible, especially on mobile devices.** Page loading times on desktop devices with a fixed Internet connection should be as short as possible, because if the user gets bored s/he will most probably leave your website. The quality of the internet connection on mobile devices is beyond the control of a programmer. On such devices it is even more important to keep the page loading times as short as possible, so that they are still acceptably long in case of a "weak" connection.

3 Policy Maker Guidelines

This section contains all findings that could not be mapped to guidelines, but rather provide information that should facilitate the decision finding for policy makers in governmental and non-governmental organizations. We explicitly state user groups (e.g., men, women, old, young, educated, uneducated, experienced or inexperienced people) that are particularly strongly affected by a certain guideline. We distinguish **four characteristics** to describe a user:

1. **Sex - Male / Female.**
2. **Age – Digital Native / Digital Immigrant.** The rise of the World Wide Web took place in the early 1990's. With regards to the history of the Internet we created two distinct age groups in order to clearly separate people who experienced a world before the Internet and people who grew up in a "technically modern" society. Participants attributed to be between 18 and 24 years old ("digital natives") and "digital immigrants" (i.e. minimum 40 year olds) were invited to participate in the study.
3. **Education – With and Without Diploma.** About one quarter (24,27%) of the Austrian population (beginning at the age of 15) holds a university entrance diploma (called the "Matura") [3]. This proportion seemed appropriate to us to choose the "Matura" as a distinctive variable for our 80 participants in order to create an educational divide.
4. **Technology Pre-Experience – Smartphone Possession.** Considering whether previous experience with modern technologies (ICT products) affects people's website handling another variable of interest was the possession of a smartphone. So half of the sample consisted of smartphone owners, the other half did not own a smartphone. This distinction was also of interest as half of our sample performed the usability study on a desktop PC and the other half on a smartphone (counterbalanced for all criteria).

We use the notion *user* to express that all user groups are affected equally.

- **The first impression of a UI is important.** This is especially true for women.
- **Users prefer to be guided through a certain process rather than exploring different ways to achieve the same goal.** Users like a step-wise, guided process, which accounts especially for experienced users and on smartphones.
- **Experienced men like map-widgets for geographical data visualization.**
- **Experienced users like step-wise structured search masks.** Be careful to reflect semantic relationships between your data in the layout of your search mask.
- **Educated users like text search fields.**

- **Age has a major impact on how a person experiences the usability of a UI.** In particular, young users care less about usability problems than older users.
- **Uneducated users do not care so much about icon design.**
- **Users prefer desktop PCs to mobile devices to access Web-pages that are not optimized for such small devices.**
- **Desktop UIs and UIs for elderly or less educated users should avoid scrolling.**
- **Previous experience with computing devices directly influences a user's attitude towards them.** Users with previous experience have a more positive attitude towards computing devices.
- **Experienced users do not care so much whether (calender) widgets work correctly or not.**
- **Men rate their abilities concerning the work with computing devices systematically better than women (especially regarding more demanding tasks).**
- **Young users tend to rate their abilities concerning demanding tasks on computing devices better than old users.**
- **Experienced users tend to be more self-confident than inexperienced users, especially concerning less demanding tasks.**

4 Booking UI specific Guidelines

This section provides guidelines that are specific for booking UIs.

- **Provide price information.** 10% of the users want to get price information on booking sites.
- **Offer maps.** Experienced men like maps.
- **Use calender widgets, especially on mobile devices.** It is easier to select a value from a predefined set of values on a touch-device than inserting text. Calender widgets support such a selection with the additional advantage that the selected date already has a valid format.

5 Adding Gender to UI Guidelines

This section highlights which guidelines are *especially but not exclusively* relevant for which user characteristics.

Guideline	male	female	young	old	experienced	in-experienced	educated	un-educated
Define the navigation clearly (provide wizard support).	x							x
Start with the essentials and end with the details.					x			
Place Menus on the left side of the UI.				x				
Place search-fields/masks on top of the UI and/or centered.		x						
Place recurrent widgets consistently.							x	
Provide a navigation bar, especially on mobile devices.			x		x			
Use intuitive and consistent wording.		x		x				
Less is more.		x					x	
Tailor the UI to the used device (e.g., desktop, tablet, or smartphone).		x					x	
Avoid scrolling on desktop UIs.				x				x
Make clear which input is processed with which action.		x						
Make page loading times for Web-pages as short as possible, especially on mobile devices.			x				x	
The first impression of a UI is important.		x						
Experienced men like map widgets for geographical data visualization.	x				x			
Educated users like text search fields.							x	
Uneducated users do not care so much about icon design.								x
Experienced users do not care so much whether (calender) widgets work correctly or not.					x			

Figure 5.1: Gender Characterisitcs for Guidelines

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