The Human Side of Service Engineering, Vol. 143, 2024, 231–234
https://doi.org/10.54941/ahfe1005102

Localizing Graphical User Interfaces for Right-to-Left Languages: A Practical Study

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ABSTRACT

This article delves into the complexities of crafting seamless User Experiences (UX) for Right-to-Left (RTL) languages, such as Arabic and Hebrew, emphasizing that more than merely reversal of layout is needed. It explores challenges in UX design, language, font selection, and cultural values, offering insights gleaned from hands-on projects. Discussions include nuances like numeral representation in Arabic, the impact of language on UI transition, the importance of font selection for brand identity, and the need for culturally sensitive design decisions. The article underscores the significance of considering language and cultural factors in creating inclusive interfaces by addressing layout adaptation, color choices, typography, and spatial perception.

Keywords: User interface localization, Human-centered design, Hands-on UX/UI design, User experience design

INTRODUCTION

Crafting a seamless User Experience (UX) for Right-to-Left (RTL) languages is a multifaceted process that extends beyond a mere reversal of the screen's layout. It's a widespread misbelief that transforming from Left-to-Right (LTR) to RTL entails merely mirroring design components. However, in reality, even a slight alteration in layout direction could significantly affect the user's physical interaction with the screen, depending on the project and medium. Additionally, cultural values and design preferences must be thoughtfully considered while making design decisions.

Recent years have witnessed a significant shift in the global innovation landscape, with software innovation outside the West accelerating at an unprecedented pace. For instance, Chinese electric vehicle brands have begun to outpace Western brands in terms of both cost and innovation (Gan, 2021). Such developments, along with the globalization of software and technology, have underscored the importance of software localization as an essential aspect of software development.

Developing culturally and linguistically appropriate User Interfaces (UIs) for RTL languages, such as Arabic and Hebrew, poses unique challenges and requires specific design approaches compared to LTR languages. As the

global market of RTL-speaking users continues to grow, it is critical for organizations to consider these factors when localizing Graphical User Interfaces (GUIs). This study examines the complexities associated with UI localization for RTL languages, offering valuable insights and solutions for interested organizations. The authors leverage their experience from a series of hands-on projects, during which they had to create best practices from scratch due to their limited availability.

DISCUSSION AND IMPLICATIONS

Based on our findings, we have divided the discussion into four key areas of areas that we will address:

- UX design
- Language
- Font
- Cultural values

UX Design: The authors encountered various design challenges that affected the user experience (UX) and user interface (UI) design in their projects. In the current era of rapid expansion of digital screens across various domains such as handheld devices, transportation, sports, aviation, and more, selecting an appropriate operating system for language support is crucial for effective system design. It can contribute to a better user experience for local customers. Additionally, other UX considerations, such as providing the option to switch between numeric systems (ex., Western Arabic Numerals vs Eastern Arabic Numerals), date/time format, measurement system (temperature, distance,...), and customizing the calendar or numerical separation format, are essential factors that need to be considered while designing for a better UX.

Language: To design a proper UI translation, the designers must be familiar with the language and the script or receive supervision from local experts. The major Western software companies now offer UI translation and localization. For example, the human interface guidelines by Apple Inc. ("Right-to-left language support," n.d.) emphasize the importance of accommodating right-to-left languages in digital interfaces, and Google Material Design ("Mirroring elements," n.d.) has also dedicated a chapter in their online design manual to this topic. However, a universal standard for RTL layout and text handling seems necessary for the rapidly growing market—for example, various tech-ups, automakers, and airlines.

Font: Properly selecting a typeface plays a crucial role in creating a brand identity that resonates with its target audience. The right font can become synonymous with a brand, creating a visual identity that differentiates it from its competitors. Font design (selection) is particularly important when designing an RTL screen, as it presents unique challenges in maintaining the essence of its LTR origin. Many Middle Eastern designers have explored the concept of designing Arabic typefaces that visually can pair with Western origins. The concept of typographic matchmaking has been explored in the work of many designers from the Middle East and Europe, yet such attempts

require careful cultural exploration. "Since printing with movable type originated in Europe in a Latin-scripted environment, other scripts still tend to be treated as a complement to Latin script, and their measurements normalized accordingly. The challenge that designers are facing is to create computer typography that does justice to all scripts and culture, according to their own standards" (Milo, 2011, p. 239). Major software companies like Apple and Google have released Western typefaces with diverse sub-lingual counterparts in digital product GUI design to carry a seamless brand design. However, for tech startups and new players in the tech market, it is often necessary to hire type designers to custom-match the brand type in other languages.

Cultural Values: The consideration of visual elements and values across various cultures is critical in ensuring the proper translation of user experience and user interface. Cultural nuances have a significant impact on user behavior, preferences, and emotional responses. Therefore, designers must be aware of these sensitive cultural-sub-layers to create inclusive interfaces. When designing multilingual products, design decisions such as white space, font choice, and layout flexibility should be informed by language-specific characteristics, as text expansion may occur when translating from the source language to the target language. For instance, the Arabic translation of the English sentence "The cat is playful" is "القطة لعوبة", which is shorter text due to the compactness of the Arabic script. Similarly, sensitivity to cultural differences is essential when designing haptic and hand gestures, as certain hand gestures, such as the thumbs up or the "OK" gesture, could convey different and potentially offensive meanings in different cultures.

The user interface design is primarily driven by information architecture, which emerges from user experience design. It is important to note that more than language proficiency is needed to deliver a fully localized product. Both Apple and Google have issued standard guidelines for the RTL design of their products. However, the manuals need more nuanced details unique to the Arabic language. For example, the human interface guidelines by Apple Inc. recommend that "To visually balance Arabic or Hebrew text with Latin text that uses all capitals, it often works well to increase the RTL font size by about 2 points." ("Right-to-left language support," n.d.). This suggestion may be a basic pragmatic approach to solving the RTL design challenge. However, it oversimplifies the complex nature of Arabic and Hebrew cultures, which originated in calligraphy. Choosing the right typeface that matches the visual expectations of local users is more complex than just adjusting the font size. This detail would significantly impact the visual interpretation of design when RTL and LTR text are displayed together on the screen, such as in Arabic and English or Hebrew and English. In cases where a fully localized-native user interface is required, a custom-designed font may be necessary to ensure proper match-making between the Western interface and the translated subsidiaries. This approach would lead to a fully "localized" user interface instead of a functionally "justified" interface design.

When designing user interfaces for Arabic and Hebrew languages, several critical considerations come into play. First, the layout must adapt to the unique right-to-left (RTL) flow of these scripts. This impacts navigation,

alignment, and overall visual hierarchy. Secondly, color choices matter. Different cultures associate colors with varying emotions and meanings. For instance, blue signifies trust globally, but red can be offensive or lucky depending on the context. Thirdly, typography plays a vital role. Arabic and Hebrew scripts have distinct ligatures and calligraphic traditions. Selecting appropriate fonts ensures both legibility and cultural resonance. Lastly, spatial perception is affected by RTL scripts. Designers must allocate screen space wisely, consider icon placement, and maintain a balanced layout. By understanding these nuances, we can create inclusive and effective interfaces that resonate across languages and cultures.

CONCLUSION

The rapid expansion of technology and interfaces beyond desktop computers into vehicles, airplanes, digital kiosks, and more presents a new opportunity to create excellent, localized experiences. However, despite all the work in this space, RTL in UX presents a significant challenge in getting right in these situations. Moreover, a "one-size-fits-all" solution leads to localized experiences that are sub-par to their Western counterparts. With the increasing globalization of technology development, it is time to dive deeper into visual and cultural studies for localization purposes. Doing RTL adaptations well involves significant complexity across UX, language, and typography. Perhaps most crucial are the cultural contexts and the fact that many Middle-Eastern users are used to their software's patterns and Latinisms, which leads to the question of what to adapt and what should be left alone. Also, the issue of text expansion in translation, truncating text, and the UI handling of extended Arabic letters (*kashida*) are other important technical challenges to factor in. Against the backdrop of shifts in the global innovation landscape away from the West, one can expect the space of RTL adaptation to take an even more central stage in the coming years. While great strides have been made by companies such as Apple and Google in this space, it is clear that there is still significant work to be done to create best-in-class, culturally appropriate user experiences that meet or exceed their Western counterparts.

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