

## Evaluation of a conceptual model for digital interfaces for garment composition labels: an integrated approach to Information Design and Inclusive Design

*Avaliação de um modelo conceitual de interface digital para etiquetas de composição de vestuário: uma abordagem integrada ao Design da Informação e ao Design Inclusivo*

Rodrigo Diego de Oliveira, Kelli Cristine Assis Silva Smythe,  
Maria Lucia Leite Ribeiro Okimoto

information design,  
inclusive design, user experience,  
textile label, clothes

This article researches the effectiveness of a conceptual model for digital clothing composition labels, designed for both domestic and professional users, by integrating principles of information design and inclusive design. Through an interaction analysis and the application of a satisfaction questionnaire with eight participants, the authors conducted a quantitative and qualitative evaluation to assess improvements in the understanding of information related to composition, washing care, symbols, and additional guidance, such as risk alerts, dimensions, and descriptions of the garment's visual characteristics, among other aspects. The results indicate that digital interfaces can overcome the limitations of physical labels identified in previous studies, particularly regarding difficulties in reading, understanding, and accessibility for individuals with blindness, low vision, color blindness, and deafness, offering a more satisfying and accessible experience for diverse user profiles.

*design da informação,  
design inclusivo,  
experiência do usuário,  
etiqueta têxtil, vestuário*

*Este artigo investiga a eficácia de um modelo conceitual de etiqueta de composição de vestuário em formato digital, voltado para usuários domésticos e profissionais, integrando princípios do design da informação e do design inclusivo. Por meio de uma análise de interação e a aplicação de um questionário de satisfação com oito participantes, os autores realizaram uma avaliação quanti-qualitativa para verificar melhorias na compreensão das informações relacionadas à composição, cuidados de lavagem, simbologia e outras orientações, como alertas de riscos, dimensões e descrição das características visuais da peça, entre outros aspectos. Os resultados apontam que as interfaces digitais podem superar as limitações das etiquetas físicas identificadas em estudos anteriores, especialmente em relação à dificuldade de leitura, compreensão e acessibilidade para pessoas com cegueira, baixa visão, daltonismo e surdez, proporcionando uma experiência mais satisfatória e acessível para diferentes perfis de usuários.*

## 1 Introduction

Composition labels on textile products are mandatory in Brazil, as established by Inmetro Ordinance No. 118/2021, which defines minimum requirements for their production and use (Brasil, 2021). The symbols follow the ABNT NBR ISO 3758 standard, which standardizes care and maintenance instructions for fabrics (ABNT, 2013). These labels are intended for both professionals (laundries and specialized companies) and the general public, providing technical information for proper handling and greater durability of garments. In Brazil, where 99% of people wash their clothes at home (Sindlav, 2024), the labels serve as a practical guide.

Despite standardization, understanding textile symbols, fabric composition, and accessibility issues remain challenges. Studies such as those by Garcia (2013), Nunes (2016), Santos & Schneider (2016), Schneider (2016, 2017), Alves (2022), and Turcatto et al. (2020) highlight problems such as the complexity of symbols, difficulty reading labels, erroneous information, lack of accessibility, and environmental impacts, such as increased waste due to reduced garment lifespan. The fashion industry, one of the world's largest sources of pollution, exacerbates this scenario with low-quality dyes and plastic waste (Yamada, 2023).

This article evaluates a conceptual model for a digital interface for garment composition labels, aiming to address gaps in understanding symbols, fabric composition, and accessibility. The model includes detailed information, such as washing processes, usage tips, and product dimensions, to enhance the perceived value of the labels. Accessibility features ensure the inclusion of people with visual impairments, color blindness, and deafness, while also benefiting other groups.<sup>1</sup>

The interface was developed in HTML (HyperText Markup Language), following the Web Content Accessibility Guidelines (WCAG) to ensure accessibility and usability (WCAG, 2023). The information and interface design contributed to the model's clarity and efficiency, adopting inclusive design principles to meet the needs of diverse user profiles (Gomes & Quaresma, 2018).

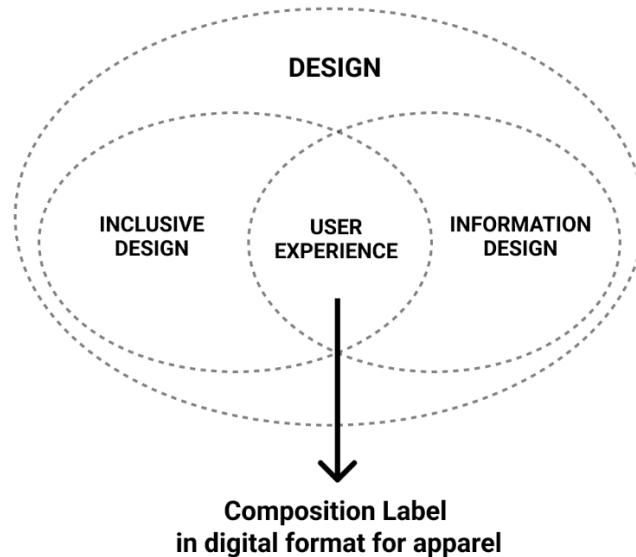
This article is organized into the following sections: 1) Introduction, contextualizing the topic; 2) Theoretical foundation, addressing textile labels, information design, inclusive design, and user experience; 3) Method, detailing data collection and analysis; 4) Results, presenting findings; and 5) Conclusion, offering reflections and final insights.

## 2 Theoretical foundation

This section examines textile composition labels through the combined lenses of information design and inclusive design, emphasizing their interdependence in promoting accessibility, usability, and user experience. Rather than defining each discipline in isolation, the discussion highlights their intersections and applicability to the development of digital garment labels. Complementary themes, such as interface design and accessibility

<sup>1</sup> This study is part of a doctoral research project at the Graduate Program in Design at the Federal University of Paraná (UFPR), focused on creating recommendations for digital labels.

guidelines, are integrated to show how these domains collectively frame the scope of this research. Figure 1 synthesizes these relationships within the study's context.



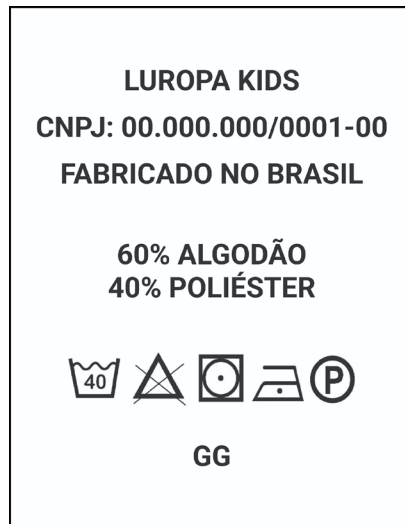
**Figure 1** Relationship between the disciplines addressed in this study.  
Source: The authors (2024).

### 2.1 Textile composition labels in Brazil

Inmetro Ordinance No. 118/2021 regulates the manufacturing, importation, and commercialization of textile products in Brazil, following the Consumer Protection Code (CDC) which mandates clear and accurate information on characteristics, composition, origin, care instructions, and size (Inmetro, 2021; Brasil, 1990). Labels must include the corporate name or trademark, manufacturer or importer tax ID, country of origin, fiber content and percentages, care instructions, and size or dimensions, when applicable (Brasil, 2021).

They must be permanently affixed, clearly visible, and printed in at least 2 mm font height, using durable materials to last throughout the product's life (Inmetro, 2021). Products with embroidery or non-textile components may require additional information, while labels in other languages must accompany the original without obscuring it. Care instructions follow ISO 3758:2013, using standardized symbols for laundering, bleaching, drying, ironing, and professional cleaning, with or without captions (ABNT, 2013).

Enforcement is handled by Inmetro and RBMLQ agencies via inspections and laboratory analysis, with fines from R\$ 100 to R\$ 1,500,000 for violations (Etiqueta Certa, 2024). These rules currently address only physical labels; no regulations exist for digital formats such as QR Codes, although a bill is in progress to mandate them (Fraga, 2023).



**Figure 2** Example of a textile composition label for clothing in its physical format in Brazil. Source: The authors (2024).

This research aims to assess a conceptual interface model for digital labels, offering both professional and domestic users a more inclusive and satisfying interaction. Within this framework, information design and inclusive design are not parallel concerns but complementary forces that shape solutions addressing accessibility, usability, and user experience requirements.

## 2.2 Information Design, Inclusive Design, and User Experience in digital garment labels

Information design ensures that data is organized, structured, and presented for optimal clarity and usability across diverse audiences (Pettersson, 2012). Within digital interfaces, this process involves defining a conceptual model, structuring information architecture, mapping interaction logic, specifying interface components, and applying a coherent visual style (Cybis, Betiol, & Faust, 2015). These elements are interdependent: visual hierarchy, contrast, and iconography, central to Pettersson's framework, influence both architecture and style; conceptual models guide user pathways; and interaction logic shapes navigation and content discovery. In the context of digital garment labels, information design defines the sequencing, grouping, and visual characteristics of data such as fiber composition and care symbols. It also extends to the accessibility of information through QR Codes, NFC chips, and responsive layouts. By integrating legibility, intuitive navigation, and meaningful visuals, information design provides the foundation upon which inclusive design can expand reach and equity.

Inclusive design, in turn, seeks to ensure equitable access for users with diverse physical, sensory, and cognitive abilities (Gomes & Quaresma, 2018). Rather than being conceived as a separate stage, it operates within the same decision-making process as information design, applying principles such as offering equivalent experiences, ensuring consistency, granting users control, and prioritizing essential content (Swan et al., n.d.). In digital garment labels, this implies that information architecture must anticipate multiple modes

of access, including screen readers, high-contrast displays, and simplified layouts, while maintaining coherence across visual and interaction elements. Accessibility, defined by Sasaki (2009) as a quality that should be embedded in all human activities, thereby becomes a key criterion of design success. While information design provides logical clarity, inclusive design ensures that such clarity is perceivable and actionable by all, extending usability to audiences often excluded by conventional labeling practices.

At this point of convergence, user experience (UX) integrates the perceptual, cognitive, and emotional outcomes of system interaction (Norman, 2008; Reis, 2022). Within the scope of digital garment labels, UX represents the intersection between the structural clarity of information design and the equitable access fostered by inclusive design. Clear, responsive, and adaptable interfaces thus become not merely the by-product but the active objective of the design process. By aligning data organization, interaction design, and inclusive principles, UX transcends its role as a measure of efficiency and satisfaction, establishing itself as a central design goal. The outcome is a labeling system capable of delivering accurate and accessible composition and care information, thereby strengthening confidence, autonomy, and engagement among all users.

### 3 Method

This study can be classified as exploratory, aiming to deepen the understanding of issues related to digital interfaces of garment composition labels (Santos, 2018). It is applied research, focused on solving specific issues related to comprehension, usability, and accessibility of digital composition labels. Regarding the approach, a predominantly abductive logic was used, combining qualitative and quantitative data, resulting in an enriched analysis contributing to more robust results (Prodanov & Freitas, 2013).

The study employed interaction testing followed by a satisfaction questionnaire based on the SUS (System Usability Scale) model. Both procedures aimed to evaluate the conceptual model of the digital garment composition label, emphasizing comprehension of textile composition, care, maintenance, textile symbols, and complementary information, aiming to enhance accessibility and provide detailed data such as dimensions, visual descriptions, and risk alerts.

The interaction test involved observation and semi-structured interviews, simulating practical use. Participants were asked to locate the label, scan the QR Code and/or NFC chip with a smartphone, open the HTML page of the digital label, and read or listen to the information. Depending on the user's profile, they were asked to adjust font size, use high contrast, the LIBRAS translator, language translator, or audio description. After each of four evaluation rounds, user feedback was implemented, allowing subsequent evaluators to test an improved interface, explaining participation variation. Screens of the digital label interface evaluated by users are shown in Figure 3.

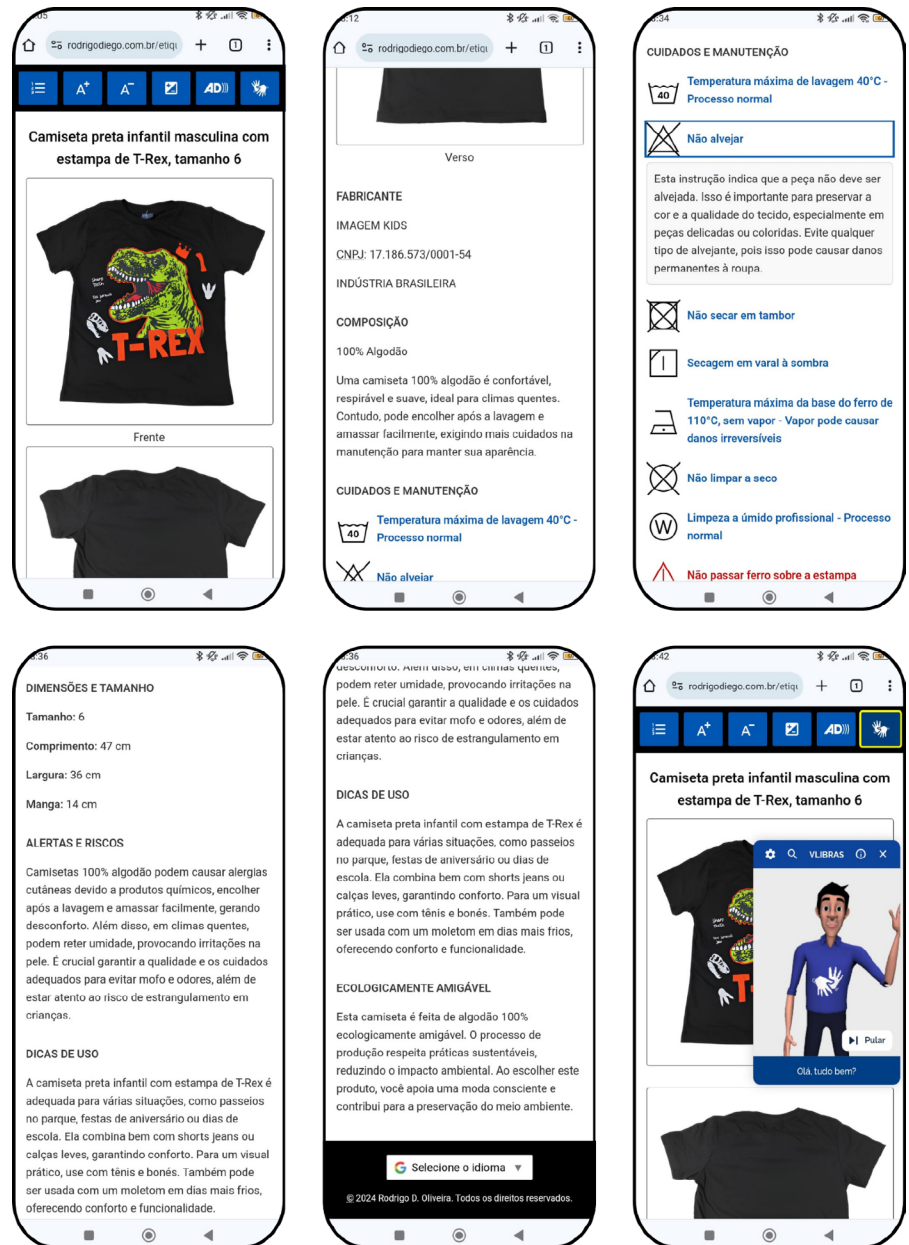


Figure 3 Digital composition label interface. Source: The authors (2024).

The questionnaire assessed user experience and satisfaction with traditional labels. Composed of twelve questions adapted from sus, it measures effectiveness, efficiency, and satisfaction (Schneider, 2017). Users responded on a five-point Likert scale from “strongly disagree” to “strongly agree.” Full questions are in the Results section.

Given the study’s inductive nature, participatory observations and in-depth interviews were prioritized for qualitative data. The Likert scale questionnaire complemented quantitative feedback; however, the small sample size and mixed participant conditions require cautious interpretation. This study served as an exploratory pilot for a larger investigation.

Eight users participated: five non-professionals and three professionals. Non-professionals included two blind individuals, one with low vision, one without disability, and one deaf person. Professionals were one laundry professional and two fashion designers/professors, providing a diverse and qualified sample. The sample was established based on the premise that five users can identify 80% of issues (Nielsen & Landauer, 2000), considered sufficient for an initial pilot validation.

All participants signed a Free and Informed Consent Form detailing research objectives, risks, data privacy, and other information. This study corresponds to a validation phase of a larger research project, with this phase approved by the UFPR Human Research Ethics Committee under CAAE No. 75099223.7.0000.0214.

## 4 Results

The interaction analysis was initially conducted with two blind users to verify whether they could locate the label using the tactile indicator or the NFC chip, whether the digital label was compatible with the smartphone screen reader, and whether the information was useful, clear, and understandable, especially regarding the description of the garment's visual characteristics and usage tips. Although all the information was evaluated, these aspects are particularly valuable for this audience, providing greater autonomy for dressing and choosing pieces.

The first blind participant (P1), a 31-year-old man, used an Android phone with the TalkBack screen reader and highlighted the effectiveness of the tactile indicator for locating the QR Code. He praised the clarity of the descriptions, particularly regarding the composition and maintenance instructions, mentioning that this information would prevent damage to his clothes. P1 experienced initial difficulties with the NFC function, requiring additional instructions, which revealed the need for improvements in chip signaling.

The second blind participant (P2), a 27-year-old woman, used an iPhone with VoiceOver and also found it easy to use the tactile indicator to access the QR Code. P2 emphasized the importance of descriptions of the product's visual characteristics (colors, patterns, and writing) and maintenance instructions, suggesting that information about the release of dye from clothing would be valuable. Similarly to P1, P2 encountered difficulties with the NFC functionality but was able to use it after activation. In the end, both participants expressed great enthusiasm for the potential of digital labels, suggesting their widespread implementation, with P2 even proposing the future integration of these labels with washing machines. The photos of the interaction test conducted with P1 and P2 are shown in Figure 4.

The third participant (P3), a 34-year-old woman without visual impairment and responsible for washing clothes in her home, had no difficulty scanning the QR Code and accessing the digital label information. She positively highlighted the explanations about the fabric composition, mentioning that many people are unaware of these details. When reading



**Figure 4** Interaction test conducted with visually impaired users.

the care instructions, she paused at the guidance “Do not tumble dry” because she did not know its meaning. After being informed that she could tap for more details, she suggested making the hyperlinks more noticeable. Overall, p3 considered the content excellent and easy to understand, and did not encounter any issues with the NFC functionality, as she was already familiar with the feature.









The fourth participant (p4), a 30-year-old woman from the fashion industry, evaluated the digital label positively, praising its functionality with smartphones. She had no difficulties using it but suggested that the measurements be more specific, such as relating to bust, waist, or hips. p4 also noted that the interface could be improved, recommending more space between photos to avoid confusion with captions, and emphasized the importance of accurate translations for technical terms, pointing out small errors in Google Translate. Furthermore, she commented that sustainability information could be used as a marketing strategy, criticizing the lack of real commitment from large retail chains.

After four interaction evaluations with the users, four improvements were made to the digital label interface: the repositioning of the audio description button to facilitate access for visually impaired people; the care and maintenance caption now displays underlined links to make them more recognizable; the “front” and “back” captions were grouped more explicitly with the photos; and guidelines about the dimensions were added, such as indicating that the width corresponds to the chest height (Table 1).

In the evaluation of the refined version, p5, a 30-year-old woman with low vision and color blindness, had slight difficulty finding the label with the QR Code, initially looking for it on the collar of the T-shirt. However, this did not impact her overall experience. She easily scanned the QR Code and used the NFC functionality. p5 praised the typography, highlighting that the sans-serif fonts and bold titles made reading easier. She tested the font enlargement and high contrast features, stating that the contrast was excellent and that the enlargement was essential. Although she considered the label to be complete, she felt the lack of details about the colors, as, in addition to her low vision, she could only see shades of gray or very saturated colors. The description of the colors would be important for giving her more autonomy and avoiding the embarrassment of asking

for help when buying clothes. At this point, the need to create a new section on the composition label dedicated to visual characteristics (Figure 5) was identified, benefiting people with low vision, color blindness, and similar conditions. The interface had already been planned to include this description, but only when accessed through a screen reader.

**Table 1** Interface adjustments after four validations, in Brazilian Portuguese. Source: Authors (2024).

Initial version of the interface (Before)	Enhanced version highlighted in red (After)
 <p>Camiseta preta infantil masculina com</p>	
 <p>Frente</p> 	 <p>Frente</p> 
<p><b>DIMENSÕES E TAMANHO</b></p> <p>Tamanho: 6</p> <p>Comprimento: 47 cm</p> <p>Largura: 36 cm</p> <p>Manga: 14 cm</p>	<p><b>TAMANHO E DIMENSÕES</b></p> <p>Tamanho: 6</p> <p>Comprimento: 47 cm (Medida do topo da camiseta até a parte de baixo)</p> <p>Largura (peito): 36 cm (Medida da largura da camiseta na altura do peito)</p> <p>Manga: 14 cm (Medida desde a costura do ombro até a extremidade da manga)</p>
 Não secar em tambor	 Não secar em tambor

**CARACTERÍSTICAS VISUAIS**

Camiseta preta com estampa na frente: a cabeça de um Tyrannosaurus Rex verde em perfil, com a boca aberta e dentes brancos. Acima, há marcas de mãos brancas e uma pegada vermelha. À direita, um osso branco e parte da caixa torácica. Abaixo, em letras vermelhas com contorno branco, está escrito 'T-REX'. O design é divertido e energético, perfeito para quem ama dinossauros.

**VISUAL FEATURES**

Black t-shirt with a front print: the head of a green Tyrannosaurus Rex in profile, with its mouth open and white teeth. Above, there are white handprints and a red footprint. On the right, a white bone and part of the ribcage. Below, in red letters outlined in white, it says "T-REX." The design is fun and energetic, perfect for dinosaur lovers.

**Figure 5** Section of visual characteristics (in Portuguese and English). Source: The authors (2024).

The sixth participant (P6), a 27-year-old woman who is deaf and a specialist in Brazilian Sign Language (Libras), considered the interface and the displayed information to be complete and excellent. As a representative of the deaf community, she focused her evaluation on the Libras translator. P6 highlighted that the VLibras translator is efficient but could be improved in the display of the alert signal. As it is currently displayed, the signal gives the impression of “be careful, or you’ll get in trouble with your mother.”

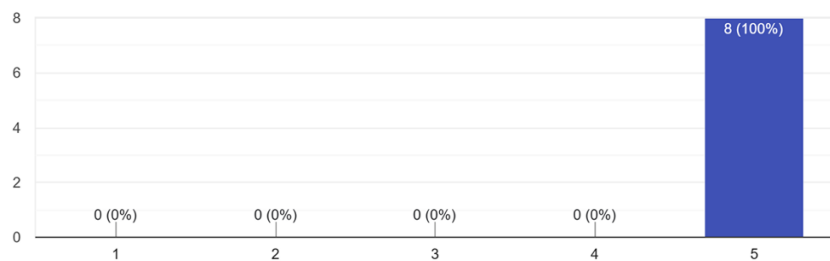
The seventh participant (P7), a 46-year-old woman, a designer, and a fashion professor, had no difficulty scanning the label with her smartphone. She pointed out that the label was “well complete” with details that made it easier to understand the composition and washing processes. P7 mentioned that, even in classes where she discussed composition labels, she noticed that students had some difficulty understanding, and that the digital version would be a great help in this regard.

The last participant (P8), a 57-year-old businesswoman and laundry professional, was very enthusiastic about the digital label, emphasizing its importance, especially since she had already worked with people with visual impairments. She even asked if the label was available for purchase. P8 praised the clarity and completeness of the information and mentioned that, although many people remove labels, the NFC chip would ensure continued access to the data. Despite some initial difficulty with the NFC, which was new to her, she was able to use it easily after a brief explanation, with the device provided by the researcher.

After the interaction session with the users, a satisfaction questionnaire was applied, consisting of twelve statements evaluated on a scale from 1 to 5, where 1 corresponded to “strongly disagree” and 5 to “strongly agree.” The results are presented below:

**1. Digital labels are better than traditional labels in general**

8 answers



**Figure 6** Comparison between physical and digital labels. Source: The authors (2024).

All participants fully agreed that digital labels are better than physical labels because, in general, they are easier to use, offer more information, and can be updated more easily than traditional labels.

### 2. I believe I will use this digital label frequently

8 answers

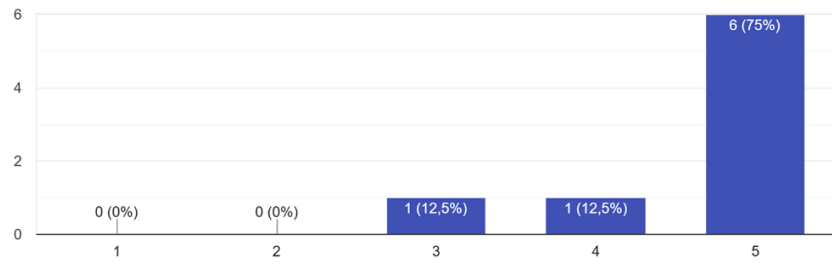


Figure 7 Frequency of label usage. Source: The authors (2024).

Most users indicated that they would increase the frequency of use if the labels were in digital format. Only one respondent marked as neutral, stating that they would use it when in doubt about washing processes.

### 3. I had difficulty locating and scanning the QR Code

8 answers

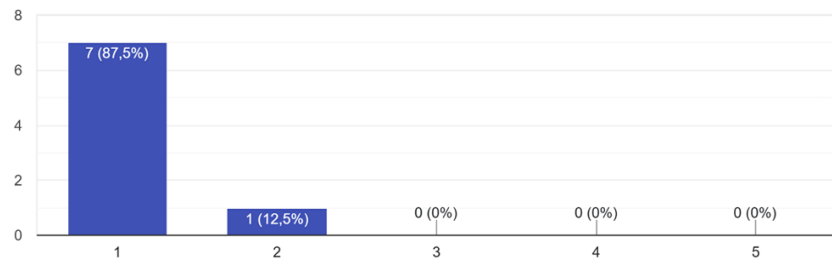


Figure 8 Difficulty in locating and using the QR Code. Source: The authors (2024).

Most users did not experience difficulty in locating and scanning the QR Code, as they had previous experience with this type of technology.

### 4. I had difficulty locating and using the zoom function (NFC)

8 answers

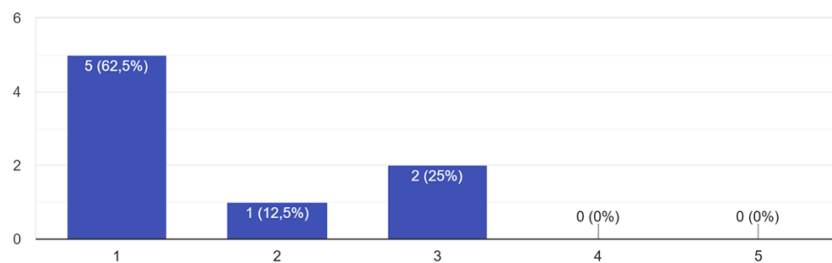


Figure 9 Difficulty in locating and using NFC. Source: The authors (2024).

Most users disagreed with the statement that they had difficulty locating and using the proximity function. However, users unfamiliar with the technology experienced some difficulty activating the NFC feature on their smartphones, especially those with visual impairments.

### 5. Information about the composition of the fabric has become clearer

8 answers

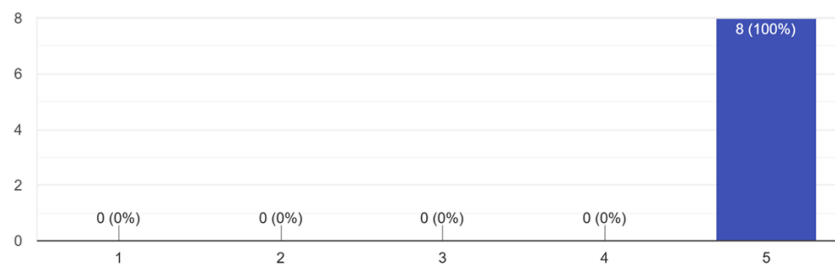


Figure 10 Understanding composition information. Source: The authors (2024).

All users agreed that the information was clearer.

### 6. Product care and maintenance information has become clearer

8 answers

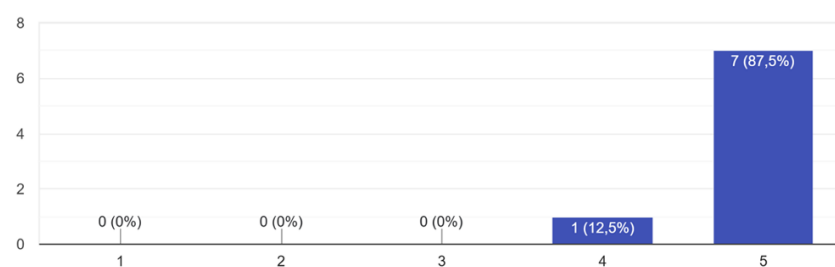
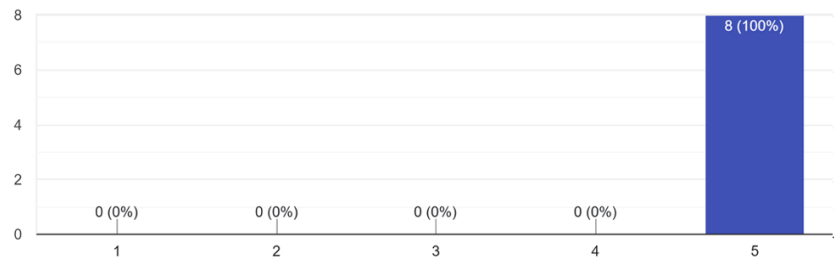


Figure 11 Understanding of care and maintenance. Source: The authors (2024).

Almost all participants agree that the information regarding care and maintenance was clearer compared to previous experiences with physical clothing labels. However, one participant pointed out that improvements could be made to the LIBRAS translator.

**7. I believe digital label is more accessible for people with disabilities**

8 answers

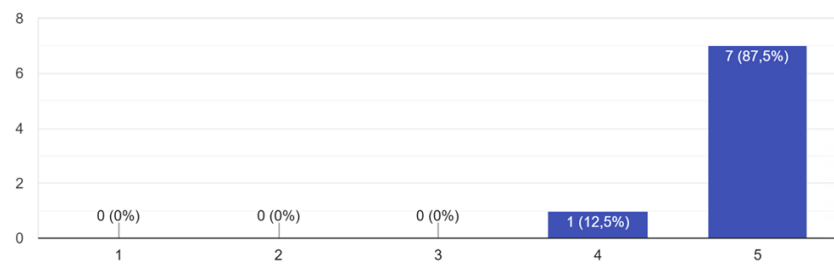


**Figure 12** Accessibility of the digital label. Source: The authors (2024).

Everyone agreed that the digital clothing label became more accessible.

**8. The digital label provides all the information I need about the product**

8 answers

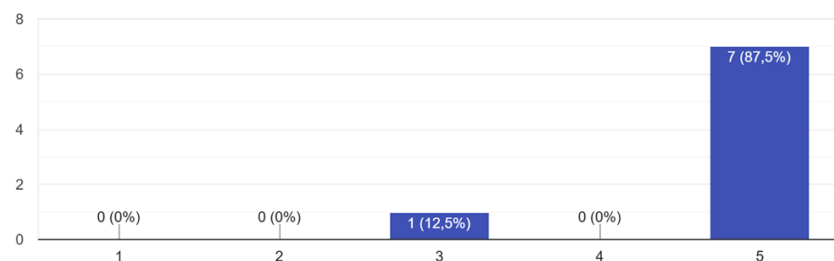


**Figure 13** Information presented on the digital label. Source: The authors (2024).

Almost all participants agree that the labels provide all the necessary information for both domestic and professional users. However, one participant pointed out that details about the visual characteristics were missing, which was corrected during the interaction analysis.

**9. I imagine people will learn to use this tag quickly**

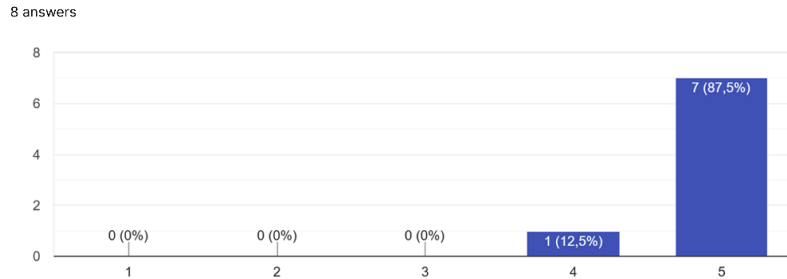
8 answers



**Figure 14** Ease of learning. Source: The authors (2024).

Almost all participants agreed that the labels are easy to learn. Only one participant noted that older people who are not familiar with technology might face difficulties.

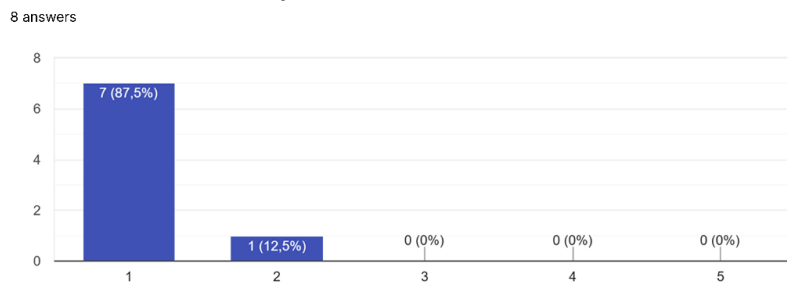
**10. Label design is easy to use and visually pleasing**



**Figure 15** Design and aesthetics of the interface. Source: The authors (2024).

Almost all participants found the interface aesthetically pleasing and easy to use.

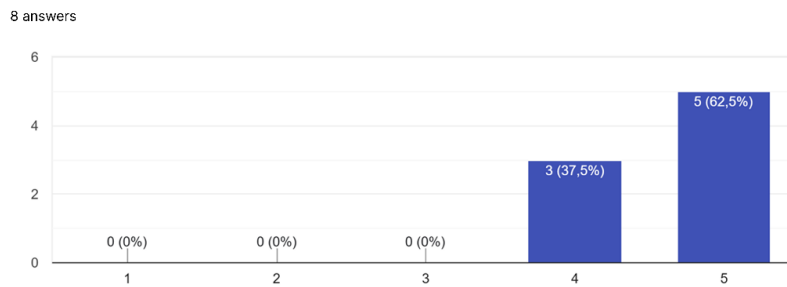
**11. I found the label too complex**



**Figure 16** Complexity of the digital label. Source: The authors (2024).

Almost all respondents disagree that the digital label is something complex.

**12. I am extremely satisfied with this digital label**



**Figure 17** Level of satisfaction with the digital label. Source: The authors (2024).

Most participants expressed satisfaction with the digital clothing label. Only three raised specific considerations, which were addressed during the interaction analysis. It can be concluded that user participation was essential in identifying both improvements in the organization of information and the inclusion of new data, such as the visual detailing of garments and their measurements. Users' perception of increased accessibility was positive, especially for people with visual impairments, who previously did not have access to this information. Regarding the difficulties in understanding the symbolism and the composition and maintenance information pointed out by Garcia (2013), Nunes (2016), Santos & Schneider (2016), Schneider (2016, 2017), Alves (2022), and Turcatto et al. (2020), the study demonstrated that the level of detail provided by the digital interface significantly improved the understanding of these details. A perspective of the final interface can be seen in Figure 18 below.



Figure 18 Final perspective of the interface in Portuguese. Source: The authors (2024).

## 5 Final considerations

This study evaluated a digital interface model for clothing composition labels, focusing on inclusive design and user experience. The findings demonstrated notable improvements in readability, comprehension, and satisfaction, supported by participants' positive feedback and questionnaire responses. Features such as visual descriptions, measurements, alerts, and usage tips enhanced user engagement, while QR Code and NFC technologies were generally well received despite minor challenges in initial NFC activation. Accessibility resources, including font enlargement, high contrast, LIBRAS translation, audio description, and WCAG-based organization, effectively supported users with visual and hearing impairments. Moreover, the semantic structuring of information and adaptation for screen readers proved successful, reinforcing that principles of information and inclusive design can be applied to textile labeling to benefit both disabled and non-disabled users.

As this was an exploratory pilot with a limited and heterogeneous sample, further research should expand testing cycles and refine methodological approaches. Future studies may include larger and more diverse groups in order to compare the perspectives of specialists such as designers and laundry professionals with those of non-specialist users in domestic contexts. Such comparisons could reveal differences in comprehension, expectations, and interaction patterns that were only partially captured in this initial phase. In addition, lessons learned from the limitations observed here, including the need for clearer NFC signaling, enhanced visual detail for color-blind users, and refinements in LIBRAS translation, point to concrete avenues for prototype evolution. Addressing these aspects in subsequent iterations will contribute to more robust guidelines for digital garment labels, strengthening both practical applicability and theoretical contributions to information design, inclusive design, and user experience.

## References

- ABNT, Associação Brasileira de Normas Técnicas. (2013). NBR NM ISO 3758: Têxteis – Códigos de cuidado usando símbolos. Rio de Janeiro.
- Agner, L. (2006). *Ergodesign e arquitetura de informação: Trabalhando com o usuário*. Ed. Quartet.
- Alves, M. A. F. (2022). *Design para etiquetas do vestuário: Compreensão e usabilidade da simbologia têxtil por profissionais brasileiros autônomos de lavagem e passadoria* [Tese de doutorado, Universidade de Lisboa]. Repositório Científico de Acesso Aberto da ULisboa. <http://hdl.handle.net/10400.5/28033>
- Brasil. (1990). *Lei n. 8.078, de 11 de setembro de 1990*. Código de Defesa do Consumidor. Brasília, DF. <http://bit.ly/3KIrNmy>
- Brasil. (2021). *Portaria n. 118, de 11 de março de 2021*. Aprova o Regulamento Técnico Mercosul sobre etiquetagem de produtos têxteis. <http://sistema-sil.inmetro.gov.br/rtac/RTAC002713.pdf>
- Cybis, W., Betiol, A. H., & Faust, R. (2015). *Ergonomia e usabilidade: Conhecimentos, métodos e aplicações* (3. ed.). São Paulo: Novatec.

- Etiqueta Certa. (2024). *Guia de simbologia têxtil*. <https://materiais.etiquetacerta.com/ebook-guia-simbologia-textil>
- Fraga, A. (2023). *Projeto de Lei n. 5518/2023*. Altera a Lei n. 5.956, de 3 de dezembro de 1973, para incluir obrigatoriedade de informação de origem em produtos têxteis e permitir a substituição de etiquetas informativas por código do tipo “QR” ou equivalente de domínio público que converta dados em texto, e dá outras providências. [https://www.camara.leg.br/proposicoesWeb/prop\\_mostrarintegra?codteor=2360074&filename=PL%205518/2023](https://www.camara.leg.br/proposicoesWeb/prop_mostrarintegra?codteor=2360074&filename=PL%205518/2023)
- Garcia, L. J., Fernandes, C. A., Sala, S. M. F., Merino, E. A. D., & Braviano, G. (2013). Design e usabilidade: Análise da eficiência de etiquetas de roupas com base na percepção dos usuários. *Educação Gráfica*, 17(3), 148–161.
- Gomes, D., & Quaresma, M. (2018). *Introdução ao design inclusivo*. Curitiba: Appris.
- Inmetro, Instituto Nacional de Metrologia, Qualidade e Tecnologia. (2021). *Produtos têxteis*. <https://www.gov.br/inmetro/pt-br/centrais-de-conteudo/publicacoes/cartilhas/cartilha-produtos-texteis-2021.pdf>
- Memória, F. (2005). *Design para a internet: Projetando a experiência perfeita*. Rio de Janeiro: Elsevier.
- Nielsen, J., & Landauer, T. K. (1993). Um modelo matemático para encontrar problemas de usabilidade. In *Anais da Conferência ACM INTERCHI'93* (pp. 206–213). Amsterdã: ACM.
- Norman, D. A. (2008). *Design emocional: Por que adoramos (ou detestamos) os objetos do dia a dia*. Rio de Janeiro: Rocco.
- Nunes, T. B. de O. (2016). *Avaliação de componentes informacionais de etiquetas de roupas: O caso de etiquetas de roupas infantis de 0 a 7 anos em São Luís – MA* [Dissertação de mestrado, Universidade Federal do Maranhão]. Sistema de Publicação Eletrônica de Teses e Dissertações. <http://tedebc.ufma.br:8080/jspui/handle/tede/1684>
- Padovani, S., & Schlemmer, A. (2021). Ensaio de interação ou teste de usabilidade... afinal, do que estamos falando? In *Anais do 10º Congresso Internacional de Design da Informação* (pp. 1154–1171). <https://doi.org/10.5151/cidicongic2021-089-357556-CIDI-Tecnologia.pdf>
- Pettersson, R. (2012). *It depends: ID – principles and guidelines* (4. ed.). Tullinge.
- Prodanov, C. C., & Freitas, E. C. (2013). *Metodologia do trabalho científico: Métodos e técnicas da pesquisa e do trabalho acadêmico*. Novo Hamburgo: Feevale. [eBook].
- Reis, G. (2022). *Fundamentos de UX*. Rio de Janeiro.
- Santos, A. (2018). *Seleção do método de pesquisa: Guia para pós-graduandos em design e áreas afins*. Curitiba: Insight.
- Santos, C. T. D., & Schneider, J. (2016). Etiquetas técnicas e sua importância para os usuários profissionais na prestação de serviços de cuidados têxteis especializados: Uma análise exploratória. *e-Revista LOGO*, 5(2), 120–145. <https://incubadora.periodicos.ufsc.br/index.php/erevistalogo/article/view/4258/4824>
- Sanches, E. C. P., & Bueno, J. (2022). Uso da linguagem aimples como prática no design da informação e design inclusivo. In C. G. Spinillo, J. Bueno, M. F. Catapan, & R. O. Corrêa (Eds.), *Novos horizontes da pesquisa em Design: Coletânea de estudos do PPGDesign/UFPR* (pp. 231–246). São Paulo: Blucher. <https://doi.org/10.5151/9786555502312-14>
- Sasaki, R. K. (2009). Inclusão: Acessibilidade no lazer, trabalho e educação. *Revista Nacional de Reabilitação (Reação)*, Ano XII, 10–16. São Paulo. <https://bit.ly/3nKxerV>

- Schneider, J. (2016). *Elaboração de requisitos para o aperfeiçoamento de projeto de etiquetas técnicas de manutenção e conservação têxtil: Um estudo fundamentado na ergonomia e na usabilidade* [Tese de doutorado, Universidade do Estado de Santa Catarina].
- Schneider, J., Ferreira, M. G. G., Ramirez, A. R. G., & Santos, C. T. (2017). Etiquetas têxteis em braille: Uma tecnologia assistiva a serviço da interação dos deficientes visuais com a moda e o vestuário. *Estudos em Design*, 25(1), 65–85. <https://doi.org/10.35522/eed.v25i1.435>
- Schneider, C. (2017). *Moodle Mobile (M-learning Moodle): Avaliação de usabilidade com o uso do SUS – System Usability Scale* [Trabalho de conclusão de curso de especialização, Universidade Federal de Santa Maria]. Repositório Digital da UFSM. <https://repositorio.ufsm.br/handle/1/15318>
- Sindilav, Sindicato Intermunicipal de Lavanderias no Estado de São Paulo. (2024). *Panorama do Mercado de Lavanderias*. <https://sindilav.com.br/mercado-panorama/>
- Swan, H., Pouncey, I., Pickering, H., & Watson, L. (n.d.). *Inclusive Design principles*. <https://inclusivedesignprinciples.info/pt/>
- Turcatto, A. S., Silveira, I., & Rech, S. R. (2020). A acessibilidade dos deficientes visuais com o vestuário por meio das etiquetas têxteis. *Projetica*, 11(1 supl.), 195–218. <https://doi.org/10.5433/2236-2207.2020v11n1supl195>
- Yamada, D. R. (2023). Moda e o direito à sustentabilidade. *Revista de Direito Socioambiental – ReDiS*, 1(2), 18–30. <https://www.revista.ueg.br/index.php/redis/article/view/12774>
- WCAG. (2023). *Web Content Accessibility Guidelines 2.2*. <https://www.w3.org/TR/WCAG22/>

## About the authors

### Rodrigo Diego de Oliveira

rodrigodiego@ufpr.br

Universidade Federal do Paraná

Curitiba, PR

### Kelli Cristine Assis Silva Smythe

kellicas@ufpr.br

Universidade Federal do Paraná

Curitiba, PR

### Maria Lucia Leite Ribeiro Okimoto

lucia.demec@ufpr.br

Universidade Federal do Paraná

Curitiba, PR

Submission date/Artigo recebido em: 7/12/2024

Approval date/Artigo aprovado em: 2/10/2025