GuideAut: A Collaborative Platform Web to Support the Prototyping of Application Interfaces for Autistic People

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Abstract. *GuideAut is a collaborative web platform that supports the development of accessible interfaces for people with autism by organizing and validating inclusive design recommendations. Its main features include sharing and evaluating recommendations. The current version focuses on collaboration through sharing and validating content. An evaluation with 14 participants, based on the Technology Acceptance Model (TAM), showed positive results: 100% approval of the recommended features, 86.7% agreement that the design improved understanding, and 80% positive usability rating, indicating the potential of GuideAut as a collaborative accessibility tool.*

1. Introduction

The increasing prevalence of Autism Spectrum Disorder (ASD) highlights the need for technological solutions to enhance the accessibility and digital inclusion of autistic people. Studies estimate that approximately 1 in 59 children in the United States is diagnosed with ASD [Baio et al. 2018], and this number continues to rise. Autistic individuals face significant challenges related to communication, social interaction, and sensory processing [American Psychiatric Association 2013], reinforcing the importance of developing interfaces tailored to their specific needs. Technology plays a key role in this context, especially through interactive applications, augmentative and alternative communication, and adaptive user interfaces [Parsons et al. 2006; Ramdoss et al. 2011]. However, despite advances in digital accessibility, there is still a lack of centralized guidelines for designing interfaces for this audience, making it difficult for developers to consistently adopt best practices. These recommendations remain fragmented across literature and often lack structured validation processes, limiting their practical applicability [Melo 2021]. Addressing this gap requires organized systems for storing, sharing, and validating such artifacts.

This study presents GuideAut, a collaborative web platform designed as a dynamic repository of guidelines and artifacts to support the prototyping of application interfaces for autistic people. GuideAut organizes recommendations, personas, and empathy maps while structuring the phases of ProAut [Melo 2021], facilitating access to

inclusive design practices and promoting the reuse of validated knowledge. Conceptually grounded in the 3C Collaboration Model (Communication, Coordination, Cooperation) proposed by Ellis et al. (1991), GuideAut enables users to share and evaluate recommendations and contribute artifacts such as personas and empathy maps. However, the platform does not yet offer direct communication mechanisms between users, such as discussion threads or comment sections. This limitation has been identified as a priority for future development, with planned features including integrated discussion tools, voting mechanisms with feedback justification, and communication channels to foster collective engagement.

Although GuideAut promotes cooperation through the exchange and evaluation of design recommendations, it has not yet achieved active co-creation or direct user interaction. By offering a structured repository that supports the reuse and validation of recommendations, the platform seeks to bridge the gap between theoretical guidelines and practical application, contributing to research on collaborative systems and digital accessibility. Future enhancements aim to strengthen co-creation and community-driven innovation, empowering designers, developers, and researchers to create more inclusive digital solutions for autistic people.

2. Methodology

The development of the GuideAut platform followed an incremental and iterative process structured into four phases: preliminary studies, definition of requirements and features, platform development, and validation. This methodological approach combined literature review, requirements engineering, architectural design, and usability evaluation to ensure the platform's effectiveness as a collaborative repository for inclusive interface recommendations targeted at autistic people.

The first phase focused on understanding autism-related characteristics, investigating accessible interface design approaches, and analyzing the ProAut process as a reference for structuring inclusive design workflows [Melo et al. 2021]. This stage also involved reviewing similar platforms to support the conceptualization of GuideAut. Two types of studies were conducted: exploratory studies, including a literature review on autism and interface design guidelines to identify best practices and recommendations; and comparative studies, analyzing related platforms to identify gaps and opportunities for innovation, particularly in structured recommendation sharing and validation. Based on these studies, the platform's requirements were defined and categorized into functional and non-functional requirements. The MoSCoW prioritization technique [Clegg and Barker 1994] was applied to identify the essential features for the initial version of the platform. A strategic decision was made to prioritize the implementation of the recommendation repository and artifact sharing features before introducing direct communication mechanisms between users, given the complexity of the domain and the need to first establish a solid knowledge base to support inclusive design practices.

The development phase began with the architectural design of the platform, including the database structure, system architecture, and module interactions. An incremental and iterative development model was adopted to ensure flexibility, scalability, and continuous refinement. Implementation was organized into three sprints, covering the deployment of the basic infrastructure and recommendation repository, the

development of the user interface and artifact visualization, and the implementation of the recommendation evaluation system. Web technologies were employed to enable future expansions, including the planned integration of collaborative features.

After the first version was developed, the platform underwent a preliminary validation process focused on assessing usability, perceived usefulness, and the relevance of its implemented functionalities. The evaluation involved 14 undergraduate students from the fifth semester of the Computer Engineering program at the Universidade do Estado do Amazonas (UEA), all with previous experience in software development and interface design. Participants interacted with the platform's features, including recommendation access, evaluation mechanisms, and artifact navigation. Prototype creation was not required, as the validation concentrated on the platform's current functionalities. Quantitative data were collected using the System Usability Scale (SUS) [Brooke 1996], while qualitative feedback was obtained through semi-structured interviews. This approach allowed the identification of usability issues and opportunities for improvement. It is important to note that this initial validation did not address direct communication or co-creation mechanisms, which remain planned for future development stages. The focus of the current evaluation was to verify the usability and effectiveness of GuideAut as a structured environment for recommendation sharing and validation, laying the groundwork for subsequent enhancements in collaborative engagement.

3. Background and Related Works

Developing accessible interfaces for autistic people requires a multidisciplinary approach integrating assistive technology, digital accessibility, and collaborative, inclusive design. GuideAut fits into this context as a collaborative web platform focused on sharing and continuously improving guidelines to support the prototyping of accessible interfaces. This section presents the conceptual foundations and related works that underpin the platform's development.

3.1 Collaborative Systems and Knowledge Sharing

Technology-mediated collaboration has been extensively studied in Collaborative Systems, encompassing tools for communication, coordination, and user cooperation [Ellis et al. 1991]. These systems are commonly analyzed along two axes: the temporal dimension, which distinguishes synchronous and asynchronous collaboration, and the spatial dimension, which differentiates co-located from distributed environments.

GuideAut operates as an asynchronous and distributed cooperative system, allowing developers, researchers, and designers to share and validate inclusive design recommendations regardless of location or time constraints. Rather than focusing on active co-creation, the platform emphasizes knowledge sharing and structured evaluation processes for continuous improvement [Wang and Noe 2010].

A widely recognized framework for analyzing collaborative systems is the 3C Collaboration Model [Ellis et al. 1991], which defines collaboration through three interconnected pillars: communication (the exchange of information), coordination (the organization of user contributions to ensure validation and categorization), and cooperation (the collective effort to maintain and enhance shared knowledge over time). GuideAut adopts this model as a conceptual basis but currently emphasizes coordination

and cooperation, as direct communication mechanisms are not yet implemented. Figure 1 illustrates how the 3C Model applies to GuideAut's current structure.

Recent studies on collaborative design tools, such as Figma and Miro, highlight the importance of shared environments that support both asynchronous and synchronous interaction [Figma 2024; Miro 2024]. While these platforms offer robust collaborative workflows, they do not address the specific challenges of inclusive design for autistic people. GuideAut seeks to fill this gap by providing a structured repository dedicated to accessibility recommendations and artifacts focused on this audience.

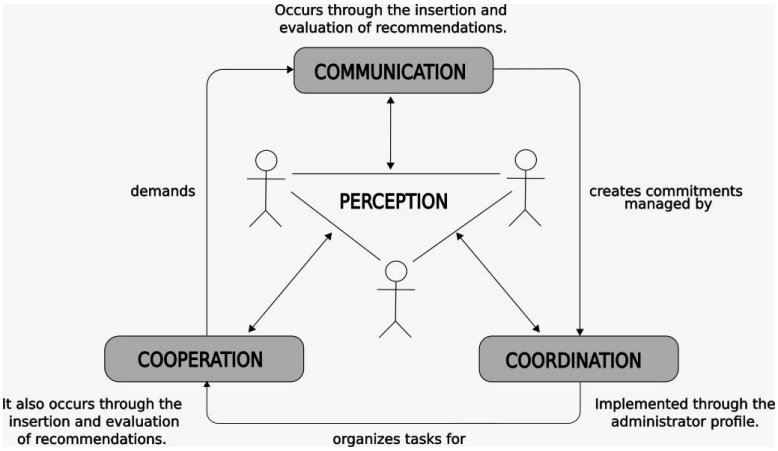

Figure 1: 3C model applied to the current version of the GuideAut.

3.2 Related Works

Several frameworks have been proposed to support digital accessibility and inclusive interface prototyping. However, few initiatives incorporate structured collaboration mechanisms that enable users to access and actively contribute to developing and validating recommendations. Gaia, developed by Britto and Pizzolato (2018), is an open-source repository that centralizes web accessibility guidelines for autistic users. Although Gaia provides detailed recommendations based on established standards, its guidelines remain static, without mechanisms for community-based validation or refinement. In contrast, GuideAut fosters continuous engagement through recommendation submission, evaluation, and refinement based on practical experiences.

AccessibilityUtil [Bittar et al. 2011] is a collaborative tool for sharing web accessibility experiences using the Design Rationale (DR) methodology to document design decisions. Despite its collaborative focus, the framework lacks a systematic process for validating and updating shared guidelines. While AccessibilityUtil addresses web accessibility broadly, GuideAut specializes in accessibility for autistic people, offering a dynamic repository with mechanisms for recommendation evaluation and the sharing of inclusive design artifacts such as empathy maps and personas.

Complementing these initiatives, recent systematic reviews on collaborative systems emphasize the importance of mechanisms that support the aggregation, visualization, and organization of distributed knowledge [Vasquez-Bermudez et al., 2021]. Such approaches reinforce the need for environments that facilitate knowledge sharing and structured refinement, aligning with GuideAut's proposal to enhance inclusive design practices through community-driven contributions.

When comparing these initiatives with GuideAut, it becomes evident that it incorporates elements typical of collaborative systems based on collective intelligence, where the Framework 's value increases as more users actively participate in building and refining information [Malone et al. 2010]. This approach aligns with contemporary trends in collaborative support systems, in which the aggregation of distributed knowledge leads to more effective and adaptable solutions [Ellis et al. 1991].

4. GuideAut

GuideAut is a collaborative web platform that supports prototyping accessible interfaces for autistic people. Its main objective is to centralize and organize inclusive design recommendations and artifacts, fostering knowledge sharing and continuous improvement among developers, designers, researchers, and other professionals involved in developing accessible technological solutions. Figure 2 presents the main interface of GuideAut, highlighting the initial navigation options and access to key features such as the ProAut tutorial, artifacts, recommendation repository, and design patterns (DPAut) [Gomes et al. 2021].

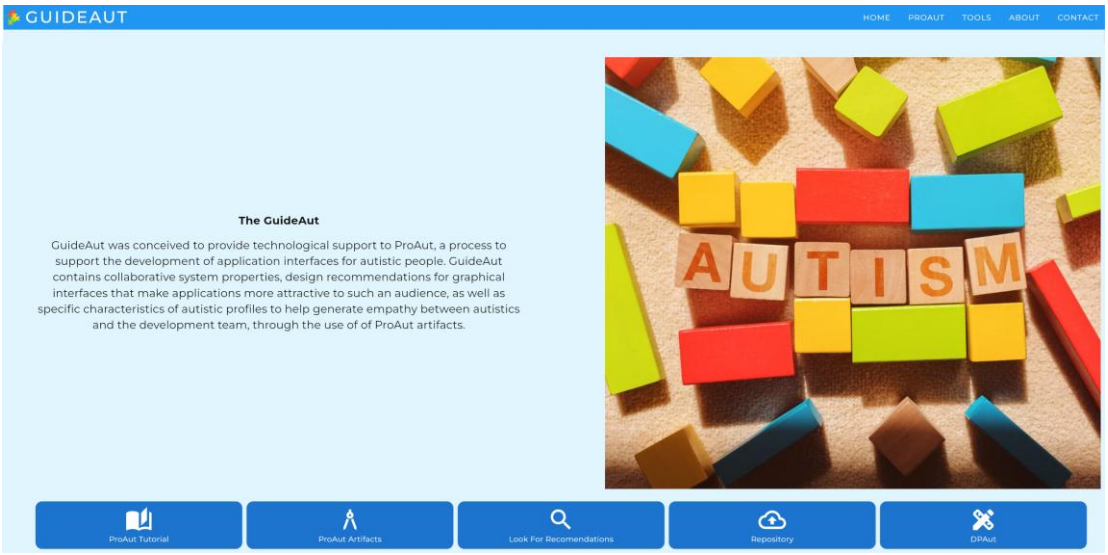

Figure 2. GuideAut home page showing the main navigation and access to platform features.

GuideAut was designed to integrate ProAut artifacts, including EmpathyAut [Melo et al. 2020a], PersonAut [Melo et al. 2020b], and the Autism Characterization Form [Melo et al. 2021], presented initially as independent theoretical models. The platform is expected to evolve into a complete environment for organizing and documenting inclusive design workflows, promoting the reuse of best practices, and reducing knowledge fragmentation. In its current version, GuideAut includes the recommendations repository, where users can submit, evaluate, and refine guidelines for accessible interface design, and the EmpathyAut tool, which supports generating and sharing empathy maps. Recommendation validation is performed through community-based mechanisms, allowing users to assess and contribute to continuously improving shared guidelines. While GuideAut promotes collaboration through content sharing and evaluation, it does not yet offer direct communication features such as discussion threads or co-editing tools. These mechanisms remain planned for future development phases.

The platform differentiates itself from frameworks such as Gaia [Britto and Pizzolato 2018] and AccessibilityUtil [Bittar et al. 2011] by offering a dynamic recommendation-sharing and refinement environment. While traditional platforms often provide static guidelines or operate as forums for experience exchange, GuideAut promotes structured validation and continuous enhancement of recommendations, explicitly focusing on inclusive design for autistic people. The platform also incorporates sensory-related guidelines and customizable interface recommendations, addressing the particular needs of this audience. Through this approach, GuideAut contributes to the field of collaborative systems for digital accessibility, addressing gaps identified in both research and practice and supporting the development of more accessible and user-centered interfaces.

4.1 Technological Architecture

GuideAut adopts a client-server architecture for scalability, flexibility, and ease of use. The Client framework manages the user interface, while the Server framework handles authentication, data storage, and communication. Flutter was used for the client side, enabling accessible and responsive interfaces for web and mobile platforms. Google Firebase was employed on the server side, providing secure authentication, real-time database synchronization, and scalable hosting.

Data management relies on Cloud Firestore, a document-oriented NoSQL database that supports real-time synchronization and flexible data structuring through collections and documents. The main collections include users, recommendations, categories (grouping recommendations into subject areas), and ratings (storing user reviews of submitted recommendations). Communication between the client and server uses Firebase's REST API, supporting a decoupled architecture that facilitates future module integration. Additionally, local caching with Hive ensures partial data availability under limited connectivity conditions.

4.2 Requirements and Features

The platform requirements were defined based on preliminary studies, emphasizing a user-centered approach. The recommendation repository and artifact sharing features were prioritized as central to the platform's initial scope. The MoSCoW prioritization technique [Clegg and Barker 1994] was applied to define essential functionalities while outlining collaboration features, such as direct user communication, as part of the future roadmap. Table 1 summarizes the main requirements, reflecting the incremental and iterative approach adopted in the platform's development.

Table 1 – GuideAut Platform´s Requirements

ID	Nome do Requisito	Description
FR001	List of ProAut phases	Displays all *ProAut* phases, allowing users to explore the process in detail.
FR002	Access to the ProAut Tutorial	Provides an interactive guide explaining the functionality of each *ProAut* phase
FR003	Submit Recommendations	Allows users to share recommendations based on their experiences or bibliographic references.
FR004	List Recommendations	Displays user-submitted recommendations, organized using relevance filters for easier navigation.
FR005	Access Specific	Provides detailed access to individual

	Recommendations	recommendations.
FR006	Search for Interface Patterns	Enables users to search for recommended design patterns for accessible interfaces for autistic people.
FR007	User Registration	Implements authentication and user management to ensure secure access to platform features.
FR008	Tools	Provides access to tools for creating and sharing inclusive design artifacts, such as EmpathyAut [Melo et a. 2020a] and PersonAut [Melo et al. 2020b].

The platform was developed modularly to align with its knowledge-sharing and recommendation validation objectives. Integration with ProAut artifacts, including EmpathyAut, PersonAut, and DPAut, aims to support the organization of inclusive design processes by enabling the reuse of structured design resources. Access control mechanisms regulate usage through authentication and role-based authorization, while an administrative panel allows user and recommendation management, focusing on content moderation and alignment with platform objectives. The user community evaluates recommendation quality and applicability through the provided rating mechanisms.

The Recommendations Module enables users to submit, categorize, search, and evaluate guidelines, facilitating the discovery and refinement of best practices for inclusive interface design. Figure 3 presents the platform interface for listing and ranking recommendations, illustrating how users can view, assess, and prioritize shared guidelines. Additional screenshots, including artifact creation and user management features, will be presented in future publications as these functionalities are fully implemented. The figure included here exemplifies one of the key features of the current operational system, which is already available to support inclusive interface prototyping.

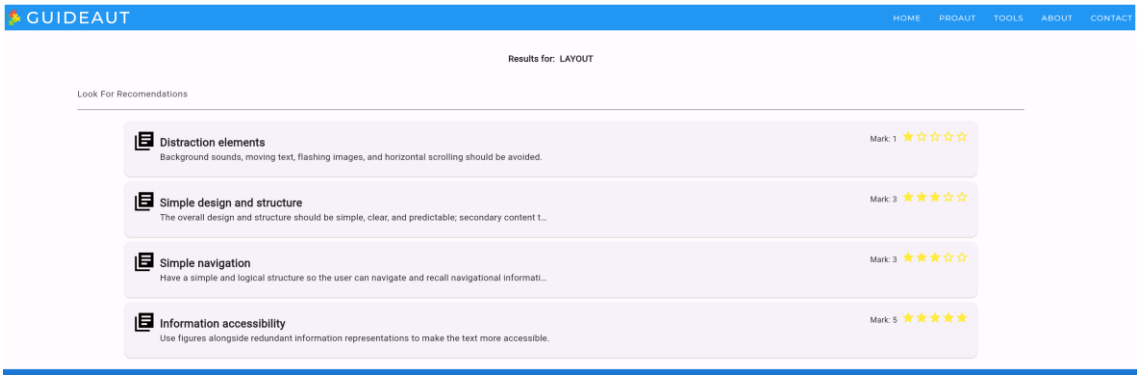

Figure 3. GuideAut interface showing the list of design recommendations with user evaluations (ranking feature).

5. Platform Evaluation

The evaluation of the GuideAut platform was carried out using the Technology Acceptance Model (TAM), initially proposed by Davis (1985) and later refined by Venkatesh and Davis (2000). TAM is widely recognized for assessing user acceptance of new technologies, focusing on two core constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). The evaluation aimed to verify user perceptions of

GuideAut, identify strengths and areas for improvement, and validate the platform's suitability to support the prototyping of accessible interfaces for autistic people.

The study involved 16 undergraduate students from the fifth semester of the Computer Engineering program at the Universidade do Estado do Amazonas (UEA). After receiving instructions on the platform's functionalities, participants interacted with GuideAut remotely and completed an online questionnaire. Fourteen valid responses were collected. Regarding their profiles, participants self-declared as developers (10), researchers (3), and designers (1). Professional experience ranged from less than one year to more than three years, with half reporting previous experience developing applications for autistic users.

The questionnaire was structured based on TAM constructs. It included four categories: evaluator profile, perceived ease of use, perceived usefulness, and intention to use the platform, with space for improvement suggestions. Responses were collected using a five-point Likert scale and, for analysis purposes, were dichotomized into positive ("Strongly Agree" and "Partially Agree") and negative ("Neutral," "Partially Disagree," "Strongly Disagree") groups. This approach, commonly adopted in usability studies, simplifies the presentation of results and highlights general acceptance trends.

The results for Perceived Ease of Use were positive, with 80% of respondents agreeing that the platform is intuitive and easy to navigate. Reviewers considered the ProAut process tutorial an exceptionally well-structured resource. However, usability issues were reported, particularly in relation to user registration (53.3% reported difficulties due to lack of feedback and field validation), clarity in submitting recommendations, and responsiveness on mobile devices. Figure 4 shows a summary of these findings.

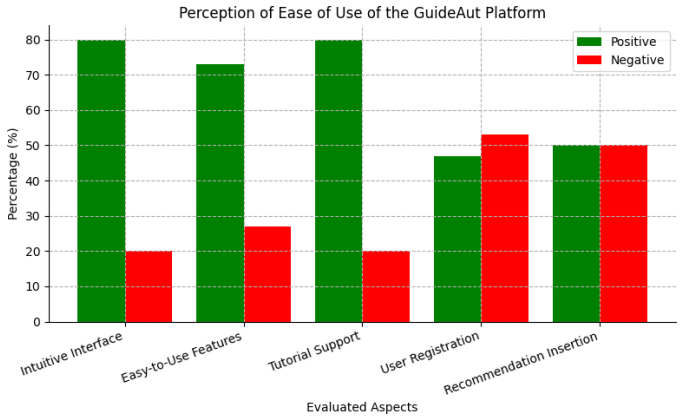

Figure 4. Users' evaluation of the platform's ease of use.

In terms of Perceived Usefulness, the results were also favorable. As shown in Figure 5, 80% of participants agreed that the system provides useful information for developing accessible interfaces and enhances their knowledge of the subject. Additionally, 86.7% indicated that GuideAut facilitates understanding the ProAut phases and artifacts. The Recommendations Module achieved unanimous approval, with 100% positive evaluations — 88% "Strongly Agree" and 12% "Partially Agree" — confirming its relevance in supporting inclusive design practices.

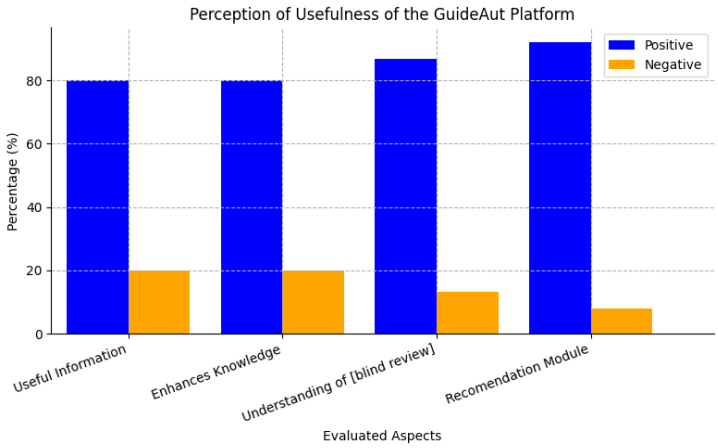

Figure 5. Evaluation results of perceived usefulness.

Regarding the intention to use the platform, 64% of participants expressed interest in continuing to use GuideAut. The most valued features were the ProAut tutorial, recommendation registration and sharing, search tools, and the evaluation system. Figure 6 illustrates these preferences.

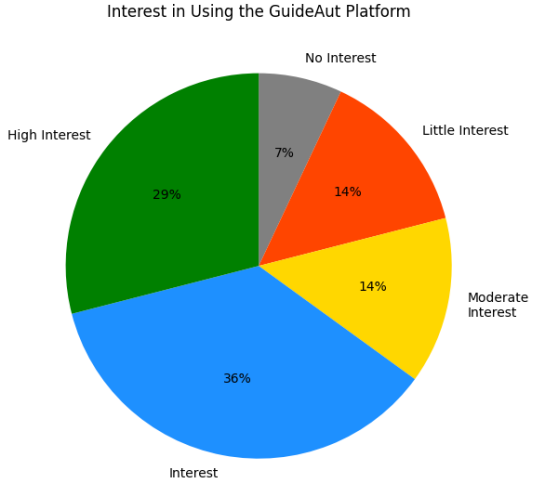

Figure 6. Intention to use the GuideAut platform.

Participants also provided qualitative feedback, highlighting the tutorial's clarity, the intuitive interface, and the organization of the ProAut process as positive aspects. Suggestions for improvement included making the tutorial more dynamic and visually engaging, enhancing mobile responsiveness, and improving feedback mechanisms during user registration and recommendation submission.

Although this first evaluation cycle focused on usability, perceived usefulness, and importance, future assessment stages will address collaborative aspects such as user engagement and contribution quality. These ongoing evaluations will support GuideAut's continuous evolution as a dynamic repository for inclusive design knowledge.

5.1. Discussions

The evaluation results confirm GuideAut as an effective platform for promoting inclusive design practices through knowledge sharing and recommendation validation. The initial user study demonstrated strong acceptance regarding the platform's usability and perceived usefulness, particularly highlighting the intuitive navigation system (80% approval) and the recommendation module (100% approval). These findings indicate that the platform fulfills its primary objective of facilitating access to structured guidelines and artifacts to support the prototyping of accessible interfaces for autistic people. The qualitative feedback collected during the evaluation was essential for identifying specific areas for improvement, especially regarding mobile responsiveness and feedback mechanisms during user registration and recommendation submission. These insights informed subsequent refinements, including real-time validation in forms and viewport optimization for mobile devices, enhancing usability while preserving the platform's core functionalities.

GuideAut's main contribution is bridging the gap between theoretical accessibility guidelines and the practical interface design challenges for autistic users. By providing a dynamic repository of structured recommendations and artifact sharing capabilities, the platform helps developers and designers consistently access, evaluate, and apply best practices. The high approval rates regarding perceived usefulness, including the 86.7% agreement on the platform's contribution to understanding the ProAut phases and artifacts, reinforce the effectiveness of this approach across varying levels of user expertise. Three key contributions emerge from this work: (1) the development and validation of a knowledge-sharing platform tailored to inclusive interface design; (2) the proposal of a structured process for recommendation sharing and validation in specialized accessibility domains; and (3) empirical insights into balancing usability, clarity, and content organization in expert-oriented digital tools. Although GuideAut has not yet implemented direct communication mechanisms or co-creation features, these aspects remain planned in its development roadmap. Future work includes expanding collaborative functionalities and exploring integration with professional design environments to strengthen the platform's role as a dynamic support tool for inclusive design.

It is also important to clarify that, while GuideAut is designed to support the development of interfaces for autistic people, its primary audience consists of developers, designers, and researchers who apply accessibility recommendations in their projects. Autistic individuals were not directly involved in this initial evaluation, as the focus was on assessing the platform's usability, usefulness, and adequacy for these professionals. Nevertheless, the "Nothing About Us Without Us" principle remains central to the broader context of inclusive design. Future research should encourage developers to assess the practical effectiveness of these recommendations in real-world projects involving autistic users, ensuring that their needs and perspectives are adequately considered throughout the design process.

7. Conclusions

This work presented GuideAut, a collaborative web platform that supports inclusive interface prototyping for autistic people through structured knowledge sharing and recommendation validation. By organizing accessibility guidelines and design artifacts

in a dynamic repository, GuideAut addresses a key challenge: the fragmentation of recommendations and the absence of structured processes for their evaluation and reuse by developers and designers.

Unlike static repositories, GuideAut enables the sharing, evaluation, and refinement of recommendations over time by its user community, providing a sustainable model for disseminating best practices in inclusive design. The evaluation demonstrated high acceptance of the platform's usability and usefulness, with 100% approval of the recommendation system and 86.7% agreement on its contribution to improving the understanding of the ProAut process and artifacts. These outcomes confirm the platform's potential to support professionals in applying accessibility guidelines more effectively.

The main contributions of this work include: (1) the development and validation of a functional platform for knowledge sharing in inclusive interface design for autistic people; (2) the proposal of a structured process for recommendation organization and community-based validation in specialized accessibility domains; and (3) empirical insights into balancing usability and structured information management in expert-oriented systems.

Although the current implementation focuses on recommendation sharing and validation, integrating direct communication mechanisms and co-creation features remains planned for future development. Upcoming improvements include personalized workspaces (My Projects module), advanced recommendation ranking algorithms, and engagement analytics to monitor user participation and contribution quality.

This ongoing development reinforces GuideAut's commitment to inclusive design while paving the way for future research on participatory approaches in collaborative systems. The platform offers immediate practical benefits and long-term research value, contributing to the advancement of accessibility tools and the promotion of digital inclusion for autistic people.

References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. American psychiatric association.

Baio, J. (2018). Prevalence of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, United States, 2014. MMWR. Surveillance summaries, 67.

Bittar, T. J., do Amaral, L. A., & Fortes, R. P. D. M. (2011, October). Accessibilityutil: a tool for sharing experiences about accessibility of web artifacts. In Proceedings of the 29th ACM international conference on Design of communication (pp. 17-24).

Britto, T. C. P., & Pizzolato, E. B. (2018). GAIA: uma proposta de um guia de recomendações de acessibilidade de interfaces Web com foco em aspectos do Autismo. Revista Brasileira de Informática na Educação, 26(02), 102.

Brooke, J. (1996). SUS-A quick and dirty usability scale. Usability evaluation in industry, 189(194), 4-7.

Clegg, D., & Barker, R. (1994). Case method fast-track: a RAD approach. Addison-Wesley Longman Publishing Co., Inc..

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, Massachusetts Institute of Technology).

Ellis, C. A., Gibbs, S. J., & Rein, G. (1991). Groupware: some issues and experiences. Communications of the ACM, 34(1), 39-58.

Figma. Collaborative Interface Design Tool. Available at: https://www.figma.com.

Gomes, D., Pinto, N., Melo, A., Maia, I., Paiva, A., Barreto, R., Viana, D. e Rivero, L. (2021), Developing a set of design patterns specific for the design of user interfaces for autistic users, in Proceedings of the XX Brazilian Symposium on Human Factors in Computing Systems, pp. 1–7.

Malone, T. W., Laubacher, R. and Dellarocas, C. (2010) The collective intelligence genome, MIT Sloan Management Review, 51(3), 21–31.

Melo, Á. H. D. S., Rivero, L., dos Santos, J. S., & Barreto, R. D. S. (2020a). EmpathyAut: an empathy map for people with autism. In Proceedings of the 19th Brazilian Symposium on Human Factors in Computing Systems (pp. 1-6).

Melo, Á. H. D. S., Rivero, L., dos Santos, J. S., & Barreto, R. D. S. (2020b). Personaut: A personas model for people with autism spectrum disorder. In Proceedings of the 19th Brazilian Symposium on Human Factors in Computing Systems (pp. 1-6).

Melo, Á. H. D. S., Oran, A. C., dos Santos, J.S., Rivero, L., & Barreto, R. D. S. (2021). Acf: An autistic personas' characteristics source to develop empathy in software development teams. In HCI International 2021-Late Breaking Papers: Cognition, Inclusion, Learning, and Culture: 23rd HCI International Conference, HCII 2021, Virtual Event, July 24–29, 2021, Proceedings 23 (pp. 223-236). Springer International Publishing.

Melo, Á. H. D. S. (2021). ProAut: um processo para apoiar a prototipação de interfaces de aplicações para autistas.

Miro. Online Visual Collaboration Platform. Available at: https://miro.com.

Navimipour, N. J., & Charband, Y. (2016). Knowledge sharing mechanisms and techniques in project teams: Literature review, classification, and current trends. Computers in Human Behavior, 62, 730-742.

Parsons, S., Leonard, A., & Mitchell, P. (2006). Virtual environments for social skills training: comments from two adolescents with autistic spectrum disorder. Computers & Education, 47(2), 186-206.

Ramdoss, S., Lang, R., Mulloy, A., Franco, J., O'Reilly, M., Didden, R., & Lancioni, G. (2011). Use of computer-based interventions to teach communication skills to children with autism spectrum disorders: A systematic review. Journal of Behavioral Education, 20, 55-76.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), 186-204.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human resource management review*, *20*(2), 115-131.