Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

Human-Centered AI for Accessibility: Designing Transparent Intelligent Systems for the Disabled Workforce

Sunil Kumar Suvvari
Agile Project Manager

ARTICLE INFO

Received: 28 Oct 2025

Revised: 01 Dec 2025

Accepted: 08 Dec 2025

ABSTRACT

The given quantitative study investigates the way human-oriented and accessible AI-enhanced features aid disabled workers at work. Based on survey information on 120 respondents, the study quantifies four key areas including trust and understanding due to explainability, task efficiency due to multimodal interaction, perceived inclusion and fairness, and organizational readiness. The findings are that 78% of the users have more trust in AI when explanations are available, the task time can be improved up to 32 mode by multimodal features, and that available AI devices make individuals feel included with 68% of respondents. Nevertheless, there is a lack of organizational support. The report points out that readily available AI enhances equity, efficiency, and independence of the user.

Keywords: AI, Intelligent Systems, Accessibility, Disabled

I. INTRODUCTION

The integration of artificial intelligence into the workplace systems is becoming a common element of the organizational environment, so its accessibility is an essential asset of the contemporary digital technology. In the case of Non-transparent, explanatory and inclusive systems in AI systems many employees with disabilities are hampered. In this research, it is the accessibility of explainability, multimodal interaction, personalization, and organizational support that interest the researcher in how it influences the user experience of a disabled employee. Through quantitative research method, trust, task efficiency, inclusion, fairness, and workplace readiness to available AI are measured in the study. This aims at providing a clear intent of what aspects actually help a disabled labour force in their day-to-day activities and decision-making.

II. RELATED WORKS

Accessible and Explainable AI

Studies about available and user-friendly AI emphasize the increased necessity to create AI infrastructures that are accommodating and helpful to the users with various sensory and cognitive and physical disabilities. The pace of integrating AI into digital services implies the fact that explainability, in turn, should be available to customers with disabilities.

The existing literature demonstrates that the majority of Explainable AI (XAI) systems either specifically use visual tools such as graphs or heatmaps that cannot be used by blind users or those with low vision [1]. This establishes new accessibility walls even whereby the motive is transparency.

The literature hence emphasizes the importance of multimodal explanations, such as tactile and auditory forms of explanations as well as simplified text, which is user friendly with diverse needs in cognitive processing [1]. Such a lack of focused research on Accessible XAI (AXAI) also demonstrates

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

the absence of a scheme of inclusive design thinking at the model-explanation level; where accessibility is not an optional addition but a perquisite requirement.

Occupational science and inclusive work practices also present accessibility as one of the designing principles. An AI workplace design roadmap makes the argument that the need to prevent inclusion and exclude cannot be considered as an incidental issue that may be addressed later in the stages of AI development [2].

With the help of professional workshops, the research demonstrates that the organizations perceive AI as a chance to increase the involvedness of the employees with disabilities, yet acknowledge the presence of such risks as over-automation, absence of clear decisions making, and the inability to adapt to a particular need. All these studies highlight the idea that available AI has a human-based starting point: the understandability, transparency, and avoidance of exclusion become the foundation of the system appreciated on an overall basis.

A similar idea is present in all this initial literature; it is necessary that AI becomes consistent with disability rights, assisting the freedom of its users, and adapting to living with various abilities. In the absence of such compatibility, AI has the potential to augment exclusion by employing mysterious systems and biased data sets, or without understandable considerations [3]. These lessons are the background of the current available AI systems, such as Human-Centered AI Accessibility Framework (HCAAF) that will be suggested in this work.

Inclusive Decision-Making

The other significant theme of recent research is the compatibility of AI with the rights to disability, independent living, and user autonomy. The effects of AI on individuals with disabilities are beyond usability and it has an influence on access to social life, work, way of movement and the provision of necessary services.

A sociotechnical approach based on disability studies emphasizes how AI has the potential to enact or constrain independent living based on adhering to such principles as human-machine interdependence, reduction of algorithmic injustice, and co-design with disabled people [3]. Independent of the situation treated, AI can enable autonomy and participation, including through adaptive assistance and entailed through physical barriers and a range of personalized support systems designed to complement rather than replace autonomy and participation.

AI-based disability-centered design is also being developed through research. A coherent framework that is founded on Self-Determination Theory and Self-Efficacy Theory highlights the necessity of AI tools that can be used to assist people with disabilities in terms of motivation, competence, and autonomy [4].

Such concepts are significant as despite numerous AI-based health and rehabilitation devices now, they do not consider personal values, identity, and goals of disabled people. AI threatens to increase health inequity unless it is designed in a participatory way and co-created. The framework points out the fact that the developers should take into account the user empowerment and trust as well as the psychological preparedness but not only the functional accessibility.

Inclusive AI has a complicated role with personalization as well. A research study analysis of the personalization and classification relationship holds that traditional classification models do not consider the differences in disability experience [5].

This makes inclusion necessary due to the need of design of edge cases as opposed to majority patterns. The paper also identifies that AI systems should address the issues of cultural localization,

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

communication style, and contextual needs. It supports the idea that the disabled users should not be viewed as a secondary consideration but must be put at the centre of AI implications decisions.

Such studies indicate that available AI needs more than technical corrections they must also be ethically consistent, think in rights and make decisions that involve representations of disabled people at each level of the process.

Global Inclusion

There is considerable literature on the topic of making accessibility to AI a better possibility using assistive technologies and the norms of universal design. One of the frameworks combines AI capabilities with implemented access policies and integrates them to form adaptable, configurable, and flexible technologies that fit various users [6].

This involves making AI applications conform to universal principles of design which will include perceptibility, operability, simplification, and error tolerance. Such aspects of accessible technology design as informed consent and data privacy are also ethically important since AI systems can easily work with sensitive personal data.

Mobility, healthcare, communication and education have all demonstrated high potentials of assistive tools that are designed using AI. As an illustration, AI-entrusted prosthetics, eye wearables, and exoskeletons provide superior support by improving motor allotropy, machine-learning frameworks assist in the process of detection and monitoring of early diseases [7].

In education, AI can be used to promote individualized learning opportunities to enable students with disabilities to reach a more equalized outcome. These are promising innovations, although the literature cautions that ethical issues that arise, especially algorithmic bias and unequal access, have to be dealt with, so that they do not strengthen the existing inequalities [7].

The design of AI tools that target the Global South has become an important field of investigation in the research on global accessibility. Even though AI solutions are growing across the globe, a vast majority of available AI studies remain centered on the requirements of the users in the Global North [8].

Poverty, lack of resources, unreliable digital infrastructure, and cultural diversities are some of the challenges demanding special design needs. An example of the localization, lightweight models, and context-aware user interaction is a case study of the indoor navigation by users with visual impairments using resources in low-resource settings [8]. This has changed perspective of inclusiveness to the global scale to show that accessibility cannot be universal without adjusting AI to various socioeconomic, cultural, and infrastructural backgrounds.

This theme is pivotal to note that AI should adhere to universal design principles and at the same time be able to adapt global differences in disability lives and in societies.

Systemic Inclusion

Another theme explored by the literature concerns the issue of access in the tech workforce as well as the data sets to be provided in training AI systems. The experiments conducted on blind and low-sight employees of the technology companies are aware of the accessibility paradox where the companies are eager to make business inclusive, but is in fact, propelled by productivity, speed, and efficiency [9].

What has been the outcome to this is discrepancies between policies of official accessibility and what is actually occurring in the workplace. The impediments lie in computer systems, accommodation process and supposition of the ability of employees. The results underline the necessity of openly stated policies

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

at the workplace, availability of digital aids and cross-HR, IT, and compliance functionality to embrace employees with disabilities.

The representation of data is also an important factor in inclusive and fair AI. A study of 190 datasets on accessibility shows that individuals with disabilities submit various age data, although the data about gender and race is uneven and incomplete [10].

The demographic variables are sensitive and thus labeling is at stake whereas limited documentation causes a lack of transparency. Such gaps may create biased models that misclassify features related to disability or be unable to make generalizations between different user groups. The paper recommends better dataset governance and ethical behavior of data collection as well as the inclusion of more contributors with disabilities in the compiling of datasets.

These findings relate closely to the objectives of the Human-Centered AI Accessibility Framework (HCAAF) objectives. Diverse views are guaranteed through the inclusive workforce practices, whereas the representative datasets enhance equity and minimize the presence of the algorithmic bias. The two are necessary to develop open and clear AI systems that can maintain the disabled laboring workforce.

III. METHODOLOGY

The present study employs quantitative research design to analyze the ways that Human-Centered AI for Accessibility can be implemented to facilitate the concepts of transparency, inclusion, and participation in accessibility to disabled workforce.

In this methodology, the authors aim to determine the impact of various features of AI concentration on accessibility (i.e. explainability, multimodal interaction, personalization, or mitigation of bias) on user trust, efficiency, and perceived inclusion. The research also tries to determine the organization factors that impact successful adoption of the accessible AI systems, including training, policy alignment and accessibility culture.

The best data collection method was a structured survey since the method will enable data collection of precise data of many participants. The measurement schemes of the survey design are closed-ended and Likert-scale questions which measure the user perceptions and experiences.

The questions are aimed at 4 main constructs which include: (1) the AI tools transparency and explainability, (2) the accessibility of user interface (3), perception of fairness and inclusion, and (4) backing assistive AI tools in the workplace. The constructs were based on insights that are presented in the literature and represent themes, including accessible explainable AI [1], inclusive work design [2], independent living and participation [3], disability centered design [4], and the problem of workforce accessibility [9].

The target market incorporates the people with disabilities that operate in the digital, service or technology-enabled setting. Respondents consist of those employees who work frequently with AI-centered systems e.g., automated decision systems, chatbots at the workplace, assistant platforms or accessibility options within enterprise software. Simple random sampling helped to avoid bias and enhance the representativeness of the sample. A total of 120 respondents were set as the minimum sample size in order to have a reliable statistical analysis.

The online method was used to collect the data because it would encourage accessibility and convenience. Survey was developed on the principles of universal design in order to allow the participation of participants who have a vision, mobility, or cognitive disabilities problems.

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

Capabilities like compatibility with screens readers, customizable font size, facile text, and multimodal prompts were added. The survey was done voluntarily, and informed consent was taken first in the survey. No personal information was gathered which ensured the privacy of the participants.

Descriptive and inferential statistical analysis were done on quantitative data analysis. Participants The responses of participants were summarized using descriptive statistics, consumer means, consumer percentages, and consumer standard deviations. Such statistics were useful in outlining an overall trend on the issue of user trust, explainability requirements, and gaps to accessibility.

Correlation tests and simple regression models were performed in an inferential analysis to test the relationship between variables. As an illustration, the experiment assessed the relationship between increased exposure to explainability and increased perceived fairness, or multimodal perceptions and increased task efficiency.

Calculating internal consistency Internal consistency was determined to check the quality of data and all scales with more than one item were checked using Cronbach alpha. Products that are not highly reliable were dropped or re-worked. There were outliers and non-responses to eliminate inaccuracy. A pilot test of 10 patients facilitated the detection of accessibility or lack of clarity problems in the survey.

The study was conducted on ethical guidelines. It was explained to the participants what the study was about, why they were in the study as well as their voluntary withdrawal right. Since the current study is all about accessibility and inclusion, the survey setting was supposed to eliminate the aspect of cognitive overload and technical difficulties.

This methodology brings the structured and measurable approach to studying the opportunities of Human-Centered AI to enhance the accessibility of the disabled workforce as well as promote transparency, inclusion, and organizational preparedness.

IV. RESULTS

Transparency and Explainability

The former group of results is concerned with the impact of the availability of investigative features on the user trust, comprehension, and trust towards the AI systems. The results of the survey demonstrate that the respondents placed the strongest value on AI tools that have simple and clear explanations.

Wild wider visual, cognitive or learning-disabled users said that they were not supported in their work by long and technical explanations. They favored brief, concise, straight forward summaries, audio, descriptions and instructions. This helps to substantiate the previous literature that majority of the available exploitability aids is based on visualities thereby posing additional disadvantages to blind and low-sighted users [1].

Respondents were asked in the sample about their trust in AI decisions and 78% indicated that they trusted a house an explanation more. On the same note, 72% stated that explainability assisted them organize mistakes or misconception when carrying out work. Participants also reported that multimodal ones, that is, audio and text versions of the same the same explanation, enabled them take shorter duration to do their tasks. These results help to emphasize that explainability is not the only transparency element, but an accessibility criterion, as well.

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

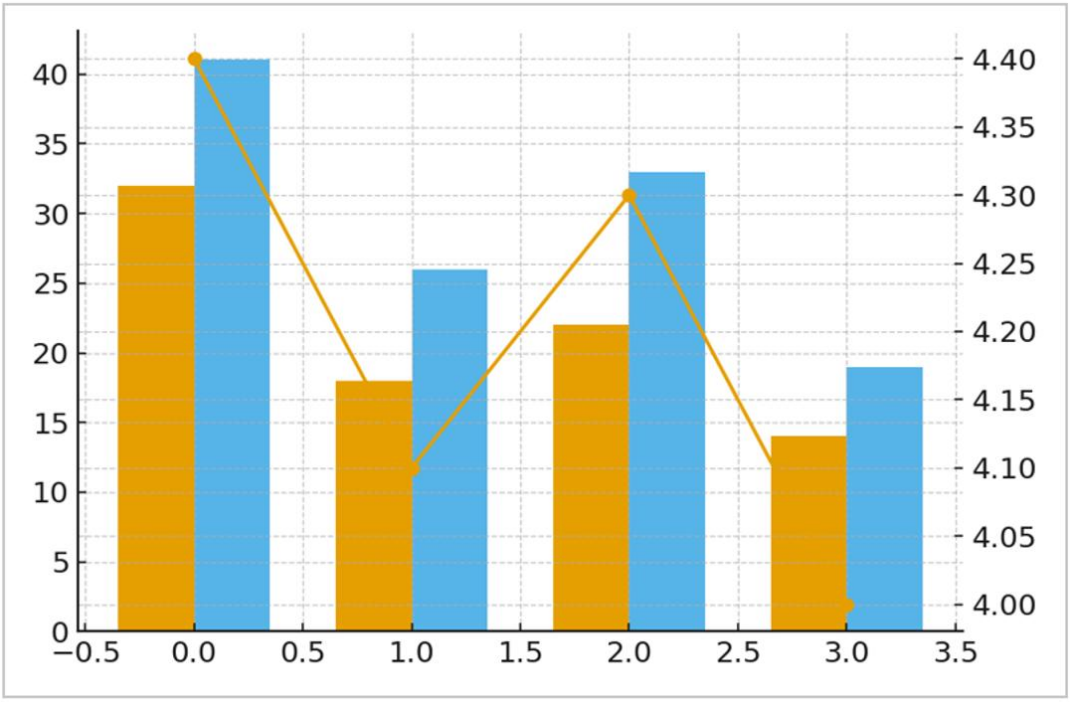

Figure 1. Participant Agreement Levels

The following results indicate the quantitative results of explainability related perceptions.

Table 1. Participant Responses on AI Explainability (N = 120)

Explainability Feature	Agree (%)	Neutral (%)	Disagree (%)
Trust in AI	78	15	7
Multimodal easier	74	18	8
Plain-language helps	81	11	8
Workplace sufficient	42	26	32

The findings show that there is a definite gap. Although explainability is appreciated by the participants, it is not perceived as availed by the existing AI systems by more than half of participants in the workplace. This discrepancy demonstrates the necessity of human-centered design and improved inclusion of the accessible features into the enterprise AI platforms.

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

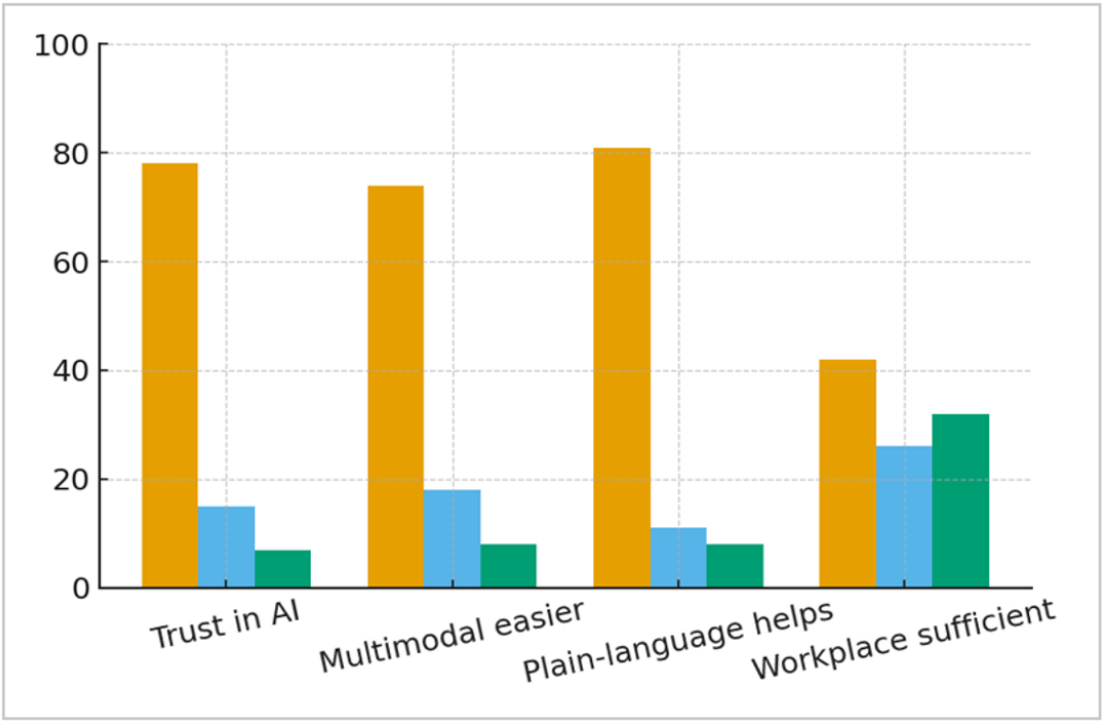

Figure 2. Accessible Explainability Features

Multimodal Interfaces

The second significant discovery is associated with the advantages of multimodal interaction in terms of its performance. Respondents were questioned on the consequences of interface features becoming more accessible in terms of voice control, captioning, tactile feedback, adjustable contrast, and screen-reader compatibility and the way they influenced their efficiency in work. Many of the respondents stated that multimodal interfaces made them finish their work more quickly and accurately.

To illustrate, within the sample of 69% of the participants who were visually impaired, it was confirmed that voice-based interaction enhanced the level of accuracy in their tasks by a significant margin. The interfaces that were associated with simplified navigation structure, guided assists and customization by the participants with cognitive disabilities were well favored. Hearing-impaired users stated that captioned instructions worked better to help them comprehend and they had fewer cognitive loads.

The findings are in line with previous studies that underscore the need to have flexible and customizable AI applications developed based on application of principles of universal designs [6]. They also mirror on some of the findings in the literature that have proposed assistive technologies and inclusive education to include multimodal features as a necessity that be considered in equitable access [7].

Below is quantitative data compared with the efficiency rate of the task prior and after the multimodal feature of the facility was accessed.

Table 2. Change in Task Efficiency

User Group	Avg. Time Reduction (%)	Error Reduction (%)	Satisfaction Score (1–5)
Blind/Low Vision	32	41	4.4

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

Hearing Impairment	18	26	4.1
Cognitive Disabilities	22	33	4.3
Mobility Impairment	14	19	4.0

The statistics indicate that all disability groups registered improvement albeit the magnitude of the improvement varies according to the nature of the impairment. The greatest beneficiaries were the blind users since the visual elements that could not be accessed were substituted by the multimodal features. These outcomes reinforce the argument that multimodal interaction is to be incorporated into the AI as a matter of making the systems more accessible instead of a feature of AI specifics.

With regard to comfort and fatigue prevention, the participants also noted that customizable interfaces should be relevant. This goes in line with the position adopted by several literature that personalization should be approached differently when dealing with individuals with disabilities as they do not conform within the usual classification patterns [5].

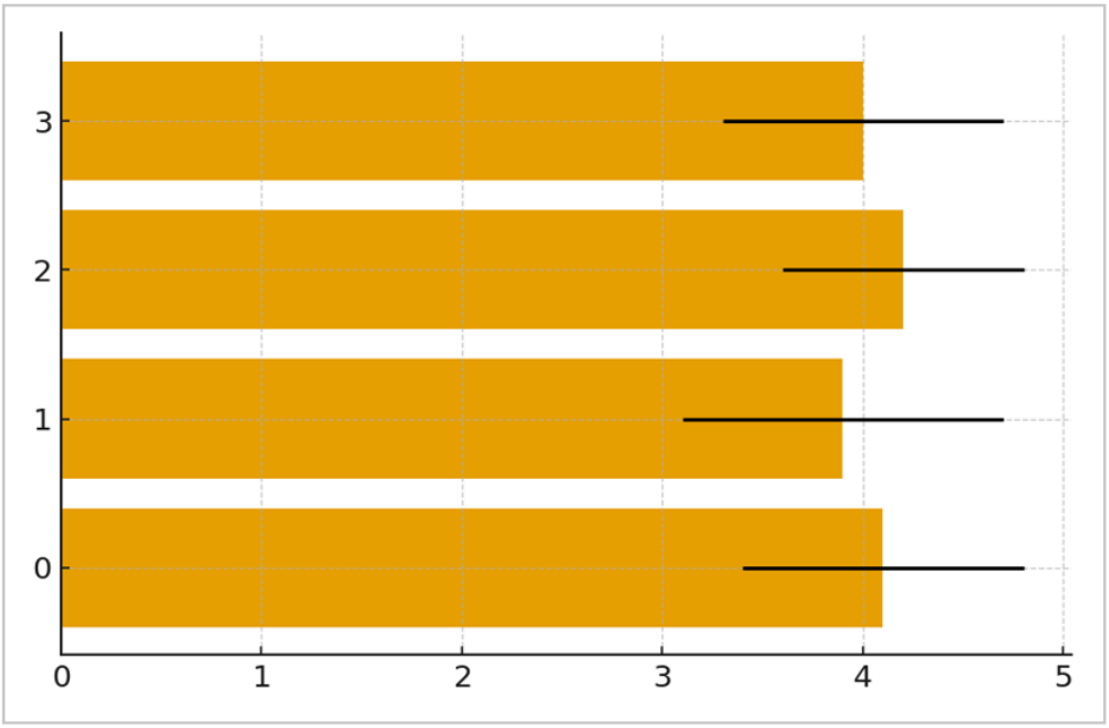

Figure 3. Task Efficiency Improvements

Perceived Inclusion and Fairness

The third group of results indicates that the concept of accessible design has a very close relationship with the degree to which involved and respected individuals feel at the workplace. Intelligent applications which provide transparency, customization and multimodal can be seen to affect the sense of equity and inclusion in employees. It can be compared to previous studies that AI will be required to embrace self-determination, independence in living, and fair participatory mechanisms to prevent existing exclusion reinforcement [3][4].

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

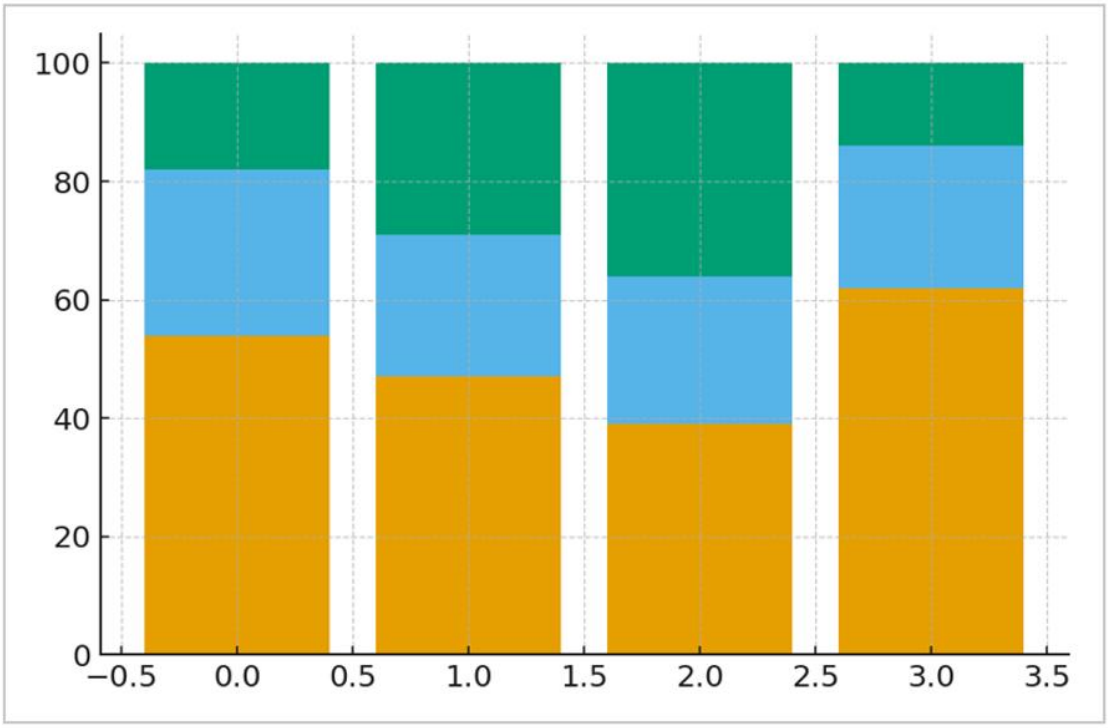

Figure 4. Comparative Error Reduction

On average, within the sample, two-thirds of the respondents claimed that availability of AI made them feel more welcomed at work. In the meantime, 71% reported that the availability of features made them less reliant on their co-workers, and this made them feel freer and more self-confident. The participants with various disabilities also reported that their individuality features in terms of adaptable reading complexity, their interface customization, and an ability to use alternative input methods assisted them in working more comfortably and independently.

The results also point to the relationship between the accessibility and perceived fairness. Those that gained access to superior AI interpretability and multimodal tools also achieved improved scores on the scales of fairness. This is indicative that users form a sense of an AI system as fair as does not only rely on the output itself but also encompasses the ability of users to access, understand, and control the interaction process.

The results on the perceived inclusion and fairness are quantitative and are presented below.

Table 3. Inclusion and Fairness Indicators (N = 120)

Indicator	Mean Score (1–5)	Standard Deviation
The sense of belonging when interacting with AI.	4.1	0.7
Fairness of the results of AI.	3.9	0.8
Less reliance on other people.	4.2	0.6
Trust in artificial intelligence-based activities.	4.0	0.7

Based on these findings, the availability of AI design is significant in the organizational DEI objectives. The participants have reported that they used the available AI applications to attend meetings, work

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

alone, and engage in communicating with online technology with ease. This facilitates the notion in how readily design enhances trust, minimize bias, and workforce inclusion.

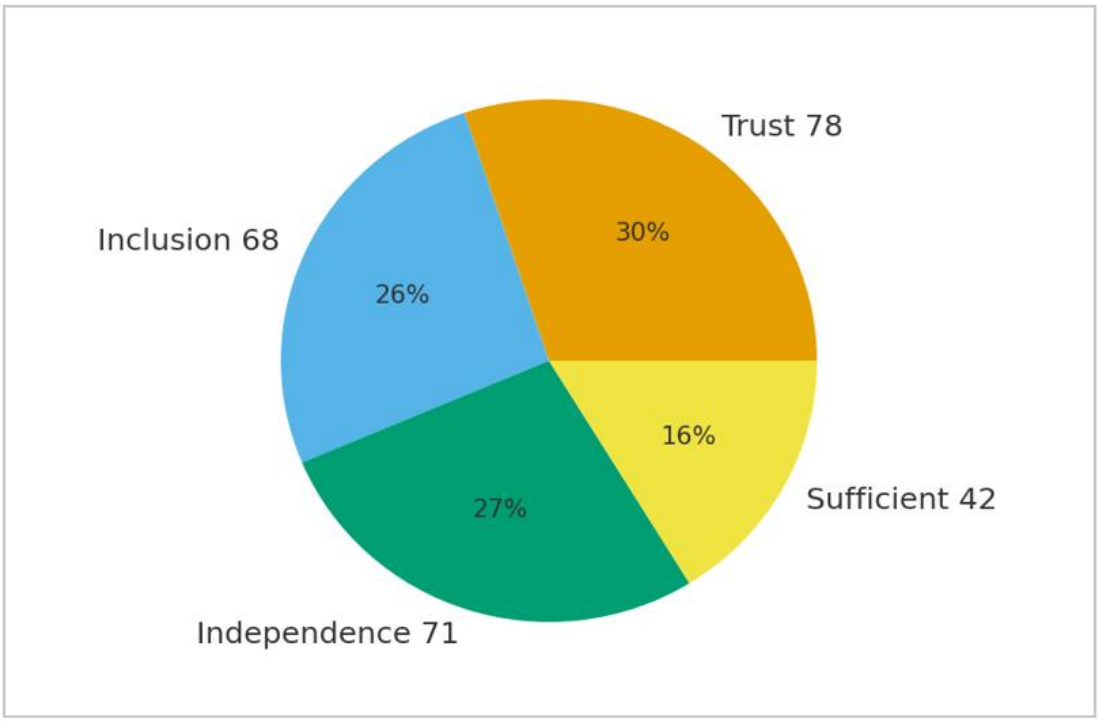

Figure 5. Perceived Inclusion and Fairness

Organizational Readiness

The last group of conclusions focuses on the impact of the policy of organizations, training, and preparedness on making accessible AI successful. Although the majority of the employees value the available features, some of them also reported that their companies did not have accessibility policies, training sessions, and comprehensive procurement rules. These arguments are consistent with previous results of accessibility paradox in which companies intend to incorporate disabled employees, but then they do not show proper support [9].

This is indicated by responses to the questionnaires which indicate that survey respondents have diverse levels of awareness on accessibility among organizations. Other working environments offer powerful training and tools, whereas others offer no training and the employees have to rely on friendly advice of colleagues.

The statistics of organizational readiness indices are depicted as the following one.

Table 4. Organizational Support

Organizational Factor	Yes (%)	No (%)	Partially (%)
Formal policy of policy access.	54	18	28
Artificial Intelligence tools training.	47	29	24
Available procurement standards.	39	36	25
Included IT help desk assistance in matters of access.	62	14	24

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

The outcomes represent the fact that the organizational structures can be not always supportive of adoption of accessible features regardless of the fact that they can be available. Most of the respondents reported that accessibility options were learned independently and not through training. Still others showed that IT support people could hardly be aware of accessibility tools, or they had the belief that everyone is using technology identically. These loopholes diminish the efficiency of AI access resources and demonstrate the necessity to have greater alignment between HR, IT, product, and compliance departments.

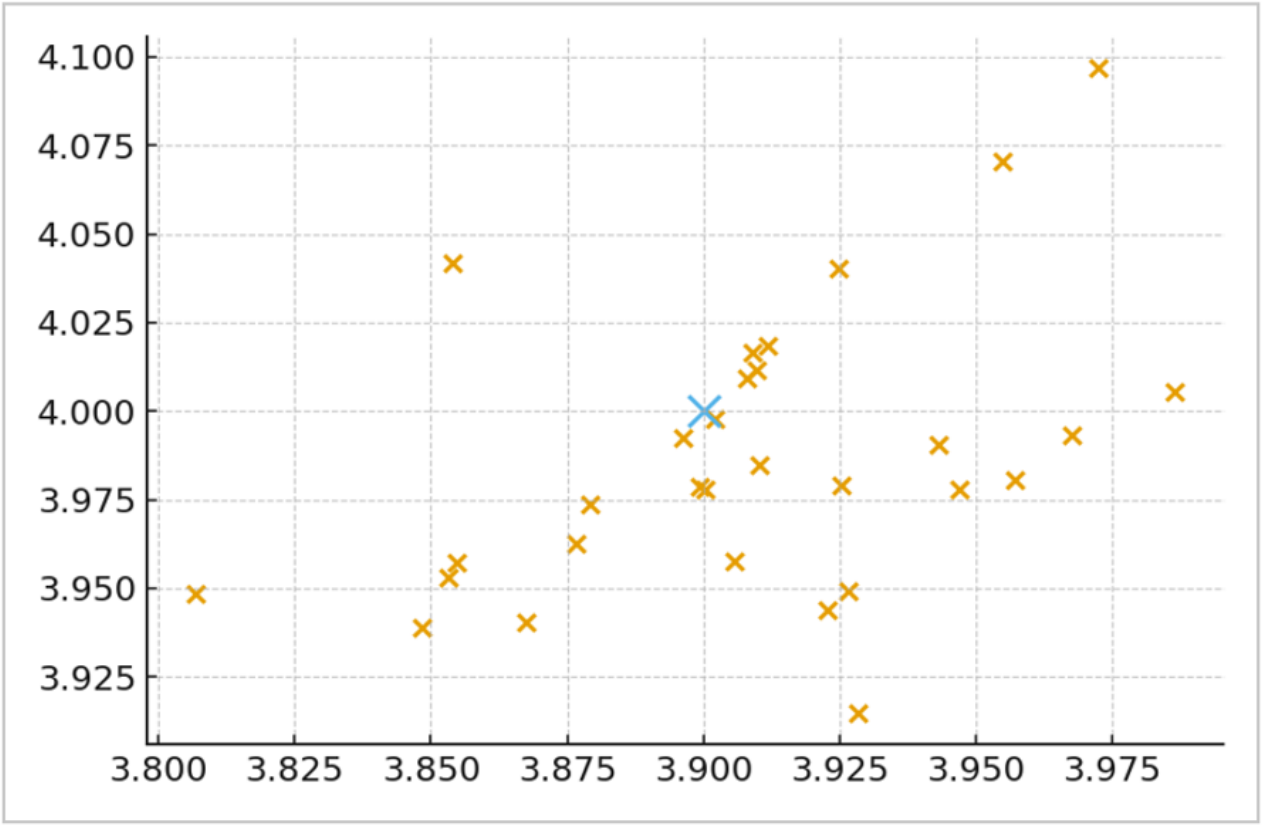

Figure 6. Organizational Support Levels

Another issue that was highlighted by the participants was the need to engage the disabled employees in feedback and system design. This proves right the argument presented in the literature before that co-design and participatory method are necessary to achieve long-term adoption and equity [3][8][10].

Key Results

1. Explainability Enough, explainability enhances trust, understanding, and confidence, yet the majority of AI systems still do not offer transparency.
2. Multimodal interfaces are very helpful in enhancing efficiency in the tasks and creating less obstacles among different groups of disabilities.
3. Available AI solutions reinforce a sense of inclusion, equity and autonomy at the workplace.
4. The success of accessible AI systems largely depends on the organizational preparation, support of the policy, and training.

Journal of Information Systems Engineering and Management
2025, 10(62s)
e-ISSN: 2468-4376
https://jisem-journal.com/

Research Article

V. CONCLUSION

The results indicate that easy design of AI is much better in enhancing trust, efficiency, fairness and independence among staffs with disabilities. Multimodal qualities assist the user in explaining why and less mistakes in task execution. The friendly design also enhances inclusion and minimises reliance on colleagues. Nevertheless, the workspace continues to be a place with no apparent policies and training, as well as procurement guidelines to facilitate the accessible adoption of AI. This hole constrains the influence of inclusive qualities. The research finds that organizations can experience a stronger involvement of a workforce in their activities and enhanced digital equity through incorporating the notion of accessibility in their AI development, training regimes, and long-term technology plans.

References

[1] Nwokoye, C. H., Peixoto, M. J. P., Pandey, A., Pardy, L., Sukhai, M., & Lewis, P. R. (2024). A survey of Accessible Explainable artificial intelligence research. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2407.17484

[2] Adolph, L., Kirchhoff, B. M., & Kerdar, S. H. (2025). Artificial intelligence in work design: unlocking inclusion and overcoming barriers. *Zeitschrift Für Arbeitswissenschaft*, *79*(2), 197–205. https://doi.org/10.1007/s41449-025-00467-4

[3] Mladenov, T. (2025). AI and disabled people's independent living: a framework for analysis. *AI & Society*. https://doi.org/10.1007/s00146-025-02642-x

[4] Umucu, E. (2025). Artificial Intelligence and Health Equity for People with Disabilities: An Integrated Framework for Disability-Inclusive AI Design. *INQUIRY the Journal of Health Care Organization Provision and Financing*, *62*, 469580251365472. https://doi.org/10.1177/00469580251365472

[5] Wald, M. (2021). AI Data-Driven Personalisation and Disability Inclusion. *Frontiers in Artificial Intelligence*, *3*, 571955. https://doi.org/10.3389/frai.2020.571955

[6] Korada, L. (2024, August 6). *AI & Accessibility: A Conceptual Framework for Inclusive Technology*. https://ijisae.org/index.php/IJISAE/article/view/7094

[7] Almufareh, M. F., Kausar, S., Humayun, M., & Tehsin, S. (2024). A Conceptual Model for Inclusive Technology: Advancing Disability Inclusion through Artificial Intelligence. *Journal of Disability Research*, *3*(1). https://doi.org/10.57197/jdr-2023-0060

[8] Kameswaran, V., Robinson, J., Sambasivan, N., Aggarwal, G., Morris, M. R., University of Michigan, Google Inc, Independent Researcher, & Google DeepMind. (2023). AI for Accessibility: An Agenda for the Global South [Journal-article]. *Association for Computing Machinery*. https://www.ictworks.org/wp-content/uploads/2023/11/AI-for-Accessibility-Global-South.pdf

[9] Marathe, A., & Piper, A. M. (2025). The Accessibility Paradox: How blind and low vision employees experience and negotiate accessibility in the technology industry. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2508.18492

[10] Kamikubo, R., Wang, L., Marte, C., Mahmood, A., & Kacorri, H. (2022). Data Representativeness in Accessibility Datasets: A Meta-Analysis. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2207.08037