**NEUROBRIDGE – AN AI POWERED CAREER SUPPORT SYSTEM FOR NEURODIVERGENT INDIVIDUALS**

**A SOCIALLY RELEVANT MINI PROJECT REPORT**

***Submitted by***

**DHANUSREE V [REGISTER NO:211423104125]**

**ANUSHA D [REGISTER NO:211423104048]**

***in partial fulfillment for the award of the degree of***

**BACHELOR OF ENGINEERING**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**



**PANIMALAR ENGINEERING COLLEGE**

**CHENNAI – 600123**

**(An Autonomous Institution Affiliated to Anna University, Chennai)**

**OCTOBER 2025**

**PANIMALAR ENGINEERING COLLEGE**

**CHENNAI – 600123**

**(An Autonomous Institution Affiliated to Anna University, Chennai)**

**BONAFIDE CERTIFICATE**

Certified that this mini project report **“NEUROBRIDGE - AN AI POWERED CAREER SUPPORT SYSTEM FOR NEURODIVERGENT INDIVIDUALS”** is the bonafide work of DHANUSREE V (211423104125),ANUSHA D (211423104048) who carried out the mini project work under my supervision.

**SIGNATURE SIGNATURE**

**Dr.L.JABASHEELA, M.E.,Ph.D., Mrs. K. CINTHUJA, M.E.**

**PROFESSOR ASSISTANT PROFESSOR**

**HEAD OF THE DEPARTMENT SUPERVISOR**

DEPARTMENT OF CSE DEPARTMENT OF CSE

PANIMALAR ENGINEERING COLLEGE PANIMALAR ENGINEERING COLLEGE NASARATHPETTAI, NASARATHPETTAI,

POONAMALLEE, POONAMALLEE,

CHENNAI-600 123. CHENNAI- 600 123.

Submitted for the 23CS1512-Socially relevant mini Project Viva – Voce examination held on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INTERNAL EXAMINER EXTERNAL EXAMINER**

**DECLARATION BY THE STUDENT**

We DHANUSREE V (211423104125), ANUSHA D (211423104048) hereby declare that this project report titled **NEUROBRIDGE – AN AI POWERED CAREER SUPPORT SYSTEM FOR NEURODIVERGENT INDIVIDUALS** , under the guidance of

Mrs. K. CINTHUJA, M.E. is the original work done by us and we have not plagiarized or submitted to any other degree in any university by us.

**1. DHANUSREE V**

**2. ANUSHA D**

**ACKNOWLEDGEMENT**

We would like to express our deep gratitude to our respected Secretary and Correspondent **Dr.P.CHINNADURAI, M.A., Ph.D.** for his kind words and enthusiastic motivation, which inspired us a lot in completing this project.

We express our sincere and hearty thanks to our Directors **Tmt.C.VIJAYARAJESWARI**, **Dr.C.SAKTHIKUMAR,M.E., Ph.D** and **Dr.SARANYASREE SAKTHI KUMAR B.E.,M.B.A.,Ph.D.,** for providing us with the necessary facilities to undertake this project.We also express our gratitude to our Principal **Dr. K. MANI , M.E., Ph.D.** who facilitated us in completing the project.

We thank the Head of the CSE Department, **Dr.L.JABASHEELA, M.E.,Ph.D.,** for the support extended throughout the project.

We would like to thank my Project Guide **Mrs. K. CINTHUJA, M.E.** and our project coordinator **Dr. KAVITHA SUBRAMANI, M.E.,Ph.D.,** and all the faculty members of the Department of CSE for their advice and encouragement for the successful completion of the project.

**DHANUSREE V**

**ANUSHA D**

**ABSTRACT**

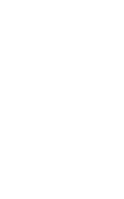
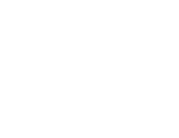
Most job platforms overlook the needs of neurodivergent users, who often struggle with confusing layouts, dense information, and unclear instructions. These barriers heighten anxiety and reduce confidence, leading to their unintended exclusion from traditional hiring systems. To create a more inclusive digital space, our platform focuses on real-time guidance, emotional support, and simplified content delivery tailored for diverse cognitive needs.Built on Supabase’s Table Algorithm (PostgreSQL), the system ensures fast, reliable data handling for quizzes and user records. The Edge Function with GPT‑4 (OpenAI API) powers adaptive quizzes and personalized feedback, evolving content based on each user’s skills and learning history. The Text Match Algorithm (Supabase Edge Function) safeguards originality by detecting plagiarism and reinforcing integrity in submissions.Through gamified quizzes and responsive feedback, users experience interactive, accessible learning that promotes confidence and skill growth. The design minimizes cognitive load with clear visuals, structured layouts, and easy navigation, ensuring comfort for all users. By merging accessibility, AI-driven personalization, and assistive design, the platform enables neurodivergent individuals to showcase their strengths and access equitable career opportunities. It ultimately redefines inclusivity by turning technology into a genuine enabler of diversity, confidence, and empowerment.

Moving forward, the platform aims to integrate advanced analytics to track user growth and employer satisfaction, helping organizations recognize and value neurodivergent talent. Collaborations with educational and corporate institutions will further expand its impact, setting a new standard for accessibility in digital employment systems. This initiative envisions not just inclusive hiring, but a reimagined digital ecosystem where empathy drives innovation and every individual’s potential truly counts.

**TABLE OF CONTENTS**

|  |  |  |
| --- | --- | --- |
| **CHAPTER NO.** | **TITLE** | **PAGE NO.** |
|  | **LIST OF FIGURES** | 1  2  3  7  10  13  16 |
|  | **ABSTRACT** |
| **1.** | **INTRODUCTION** |
|  | 1.1 OVERVIEW |
|  | 1.2 PROBLEM DEFINITION |
|  |  |
| **2.** | **LITERATURE** |
|  | **SURVEY** |
| **3.** | **SYSTEM ANALYSIS** |
|  | 3.1 EXISTING SYSTEM |
|  | 3.2 PROPOSED SYSTEM |
|  | 3.3 FEASIBILITY STUDY |
|  | 3.4 DEVELOPMENT ENVIRONMENT |

|  |  |  |
| --- | --- | --- |
| **4.**  **5.**      **6.**  **6**  **7.** | **SYSTEM DESIGN**  4.1 WORK FLOW   * 1. USE CASE DIAGRAM   2. MULTI-SESSION SUPPORT   **SYSTEM IMPLEMENTATION**  5.1 CANDIDATE MODULE  5.2 MANAGER MODULE  5.3 CUSTOMIZATION & ACCESSIBILITY  **SYSTEM TESTING**  6.1 OBJECTIVES OF SYSTEM TESTING  6.2 TESTING ENVIRONMENT   * 1. TYPES OF TESTING PERFORMED   2. TEST SCENARIOS AND RESULTS   3. OUTCOME   **PERFORMANCE ANALYSIS**  7.1 PARAMETERS MEASURED AND OBSERVED RESULTS | 20  21  22    25  26  27    29    30    31    32  33    34 |



|  |  |  |  |
| --- | --- | --- | --- |
| **8.** | * 1. TESTING METHODS   7.3 ANALYSIS  7.4 **OVERALL PERFORMANCE SUMMARY**  7.5 GRAPH  **CONCLUSION AND FUTURE SCOPE**  8.1 CONCLUSION    8.2 FUTURE SCOPE  **APPENDICES**  A.1 SDG GOALS ADDRESSED  A.2 SAMPLE SCREENSHOTS  A.3 SAMPLE CODE REFERENCE    A.4 PLAGIARISM REPORT  A.5 REFERENCES | 35  35  37  37  39  41  43  44  48  63  71 |  |

**LIST OF FIGURES**

**SECTION NO SECTION TITLE PAGENO**

3.2 PROPOSED SYSTEM 12

4.1 WORKFLOW 20

4.2 USE CASE DIAGRAM 21

4.3 MULTI-SESSION SUPPORT 21

5.1 CANDIDATE MODULE 25

5.2 MANAGER MODULE 26

5.3 CUSTOMIZATION /ACCESSIBILITY 27

7.1 USER EXPERIENCE BY YEARS 36

A2 DASHBOARD SCREENSHOT 44

QUIZ / TASK INTERFACE 45

JOB RECOMMENDATION MODULE 46

ACCESSIBILITY FEATURES 47

**CHAPTER 1**

**INTRODUCTION**

* 1. **OVERVIEW**

Neurodivergent individuals often face barriers on online job platforms due to cluttered interfaces, dense text, and unclear instructions. These challenges cause confusion, anxiety, and self-doubt, making it harder to build confidence in career development. Traditional hiring systems still favour neurotypical norms, unintentionally excluding many capable individuals. To overcome this, the platform emphasises accessibility, emotional support, and clarity, creating a guided and inclusive digital experience.

The system integrates advanced technology to personalise and simplify user learning. Supabase’s Table Algorithm (PostgreSQL) supports fast and reliable management of user data, quizzes, and performance insights. The Edge Function with the GPT‑4 Algorithm (OpenAI API) generates adaptive quizzes and personalised feedback tailored to each user’s progress and skills. A Text Match Algorithm (Supabase Edge Function) ensures originality by detecting plagiarism and maintaining academic integrity. Together, these elements create a stable, efficient, and inclusive system aligned with diverse learning needs.

Through gamified quizzes, responsive feedback, and assistive design, the platform promotes engagement, confidence, and self-expression among neurodivergent users. Its intuitive layout, clear visuals, and simplified navigation reduce cognitive load while enhancing comprehension. This approach fosters meaningful growth and reshapes digital employment access by merging empathy with technology. Ultimately, it empowers neurodivergent individuals to display their strengths and pursue fair opportunities, helping build a future where inclusivity and innovation go hand in hand.

**1.2 PROBLEM DEFINITION**

Many neurodivergent individuals face major challenges when using online job portals like LinkedIn, Unstop, and other career websites designed for neurotypical users. Complex layouts, dense text, and multitasking expectations often overwhelm users with autism, ADHD, or dyslexia—reducing engagement and confidence while limiting job access. The unemployment rate for neurodivergent adults ranges from 30 to 40 per cent, nearly eight times higher than for non‑disabled individuals, revealing systemic barriers to meaningful employment. Current platforms rarely consider differences in attention, sensory processing, and comprehension, causing frustration during profile setup, job searches, and application submission. Most career websites rely on keyword-based algorithms that ignore behavioural data and user comfort, generating irrelevant suggestions that frustrate job seekers. Accessibility features are minimal, and mental health support remains absent, leaving users uncertain and anxious. The project directly addresses these issues by reframing accessibility as a real-time, adaptive process rather than a static design element. It offers simplified navigation, distraction-free layouts, and personalised assistance to help neurodivergent users manage tasks comfortably and effectively. Powered by adaptive learning models, natural language processing, and a hybrid recommendation algorithm, Neurobridge detects user struggles in real time and tailors interventions through step-by-step prompts and supportive messaging. It also provides actionable insights to employers, guiding them in building more inclusive and accessible digital environments. By enhancing usability, readability, and fairness, the platform empowers neurodivergent individuals to demonstrate their abilities confidently while enabling organisations to access an untapped pool of skilled talent. NeuroBridge thus redefines inclusivity in employment technology, promoting an equitable, diverse, and empathetic digital workforce ecosystem .

**CHAPTER 2**

**LITERATURE SURVEY**

The study of neurodiversity in the workplace has gained increasing significance due to the persistent challenges neurodivergent individuals face in accessing meaningful employment and fully participating in professional environments. Neurodivergent individuals, including those with autism, ADHD, and dyslexia, encounter substantial barriers when navigating conventional online job platforms and organizational systems. These barriers are often a consequence of design assumptions made for neurotypical users, rather than inherent deficits of neurodivergent individuals. Understanding these challenges and creating inclusive technological solutions is crucial to reducing unemployment among neurodivergent adults, which remains alarmingly high at approximately thirty to forty percent, and to harnessing the unique cognitive strengths that this population offers. Neurobridge positions itself within this context as a real-time interactive platform that assesses skills, identifies difficulties, and provides actionable recommendations to improve inclusivity in mainstream employment platforms.

**2.1 Trends in Neurodivergent-Friendly Job Portals**

Over the past decade, the landscape of neurodivergent-friendly job portals has evolved considerably. Between 2010 and 2015, the first niche platforms began to emerge, focusing on specific neurodivergent conditions and offering limited, mostly static resources for job seekers. From 2016 to 2020, these platforms broadened their reach, including support for a wider range of neurodivergent profiles, with particular emphasis on autism and ADHD. During this period, services expanded to include skill assessments, basic recommendation algorithms, and limited accessibility features such as simplified navigation. Since 2021, advanced technologies, including artificial intelligence, machine learning, natural language processing, and adaptive interfaces, have increasingly been incorporated to provide personalized job matching, real-time skill assessment, and dynamic support. Despite these improvements, widespread adoption remains limited, and many platforms still fail to fully consider cognitive diversity, sensory sensitivity, or real-time usability feedback, leaving gaps in accessibility and inclusion.

**2.2 Frameworks and Models**

Several frameworks have emerged to guide the design of neurodivergent-friendly employment systems. The Universal Design for Learning (UDL) framework emphasizes offering multiple means of representation, engagement, and expression to accommodate diverse learning styles and cognitive abilities. Neurodiversity employment models focus on valuing the unique strengths of neurodivergent individuals, emphasizing workplace accommodations, flexible workflows, and inclusive hiring practices. Human-in-the-loop (HITL) approaches integrate continuous user feedback into AI-driven systems, allowing real-time adjustments and iterative improvements to enhance relevance and usability. These frameworks collectively aim to create systems that are not only technically robust but also empathetic to the diverse needs of neurodivergent users.

**2.3 Process Workflows**

Neurodivergent-friendly job portals generally follow structured workflows to ensure usability and engagement. The process begins with user onboarding, where personal and neurodivergent-specific information is collected, including strengths, preferences, and accessibility needs. This is followed by skill assessment, often conducted in real time using interactive quizzes, adaptive difficulty levels, and guided tasks. Personalized job matching algorithms then suggest suitable opportunities, leveraging AI, hybrid recommendation engines, and NLP to analyze job descriptions for readability and compatibility. Application support features provide assistance with resume creation, form filling, and interview preparation. Employer collaboration ensures that organizations offering roles are inclusive and equipped to accommodate neurodivergent employees. Finally, feedback and iteration mechanisms continuously track user interactions, identify barriers, and generate recommendations for improving both the portal and mainstream employment platforms.

**2.4 Review of Key Research**

Several research studies have focused on improving employment opportunities for neurodivergent individuals through technology, inclusive design, and AI-driven tools. Earlier research mainly identified barriers such as complex navigation, unclear instructions, and lack of sensory-friendly design in job portals, which made it hard for neurodivergent users to apply for jobs confidently. Later studies explored the use of artificial intelligence, adaptive learning, and natural language processing to personalize job recommendations and simplify job descriptions, showing how technology can make platforms more supportive. However, most of these studies remained theoretical or limited to pilot programs without real-time feedback or integration of mental health support. Building on these insights, Neurobridge takes a practical approach by combining adaptive AI algorithms, NLP-based content simplification, continuous skill assessment, and emotional well-being support in one platform. It applies the principles of user-centered design and continuous feedback to identify usability barriers and generate real-time recommendations for both users and employers, turning research ideas into a fully functional, inclusive employment system.

**2.5 Critical Analysis and Gaps**

The strengths of prior research lie in identifying barriers, promoting user-centered and participatory design, and proposing hybrid recommendation systems. Limitations include insufficient operational systems, lack of integration between skill assessment, mental health support, and personalized recommendations, and minimal guidance for mainstream platforms on accessibility improvements. Existing studies often remain offline or conceptual, providing limited applicability for real-time interventions.

Neurobridge addresses these gaps by implementing a fully functional platform that integrates adaptive learning algorithms, AI-driven job recommendations, natural language processing for simplifying complex content, and mental health guidance. By tracking user interactions with mainstream portals like linkedin and Unstop, neurobridge identifies usability issues and provides actionable recommendations to employers, ensuring that interface modifications rather than user adaptation drive inclusivity. This approach bridges the gap between theoretical research and practical application, creating a scalable, human-centered solution.

**2.6 Implications for neurobridge**

Neurobridge leverages trends, frameworks, and workflow insights from prior research to create an inclusive, real-time employment platform. By combining AI intelligence with human-centered design principles, it addresses the limitations of conventional portals and enables neurodivergent users to engage in skill assessment, career exploration, and job application processes with increased confidence. Furthermore, by providing feedback and recommendations to employers, it promotes inclusive hiring practices and contributes to systemic improvements in accessibility.

**2.7 Conclusion**

Neurobridge addresses this by providing an AI-driven platform that assesses skills, identifies barriers, and suggests improvements, offering a practical framework to enhance accessibility, personalization, and mental health support, enabling equitable workforce participation.

**CHAPTER 3**

**SYSTEM ANALYSIS**

**3.1 EXISTING SYSTEM**

Current online employment platforms, including mainstream portals such as LinkedIn, Unstop, and other digital job boards, are primarily designed with neurotypical users in mind. These platforms provide functionalities like job search, application submission, skill-based recommendations, and networking tools. Many platforms also integrate basic recommendation algorithms, which match candidates to positions based on qualifications, work experience, or keywords in resumes. Some studies have explored enhancements in personalized job matching; for instance, Heggo and Abdelbaki (2018) proposed hybrid information filtering engines that combine content-based and collaborative filtering to improve recommendation relevance. Similarly, Hall et al. (2024) highlighted design approaches that emphasize individual strengths rather than deficits, and Tomczak and Ziemiański (2023) studied preferences for technology-based workplace accommodations among autistic employees.

Despite these developments, existing solutions remain largely conceptual, static, or limited in scope. Most platforms fail to integrate real-time feedback, adaptive learning, or accessibility-focused design. Features such as simplified language for complex job descriptions, text-to-speech, adjustable navigation, and mental health guidance are rarely included. The platforms also lack mechanisms to monitor neurodivergent users’ interaction patterns or identify usability issues specific to this population. Human-in-the-loop approaches, which have been shown to improve engagement and personalization (Harris, 2018; Memarian et al., 2024), are not widely applied in operational job portals, leaving a gap between research insights and practically.

Neurodivergent users face multiple challenges when accessing these existing systems. Complex layouts, dense text, and fast-paced navigation can overwhelm individuals with ADHD or autism, while dyslexic users may struggle to interpret long or inconsistent instructions. Tasks such as creating profiles, understanding job requirements, applying for positions, and navigating multiple windows are often mentally exhausting and time-consuming. The lack of adaptive recommendation algorithms further limits the relevance of job suggestions, leading to frustration and missed opportunities. Additionally, the absence of in-built mental health support leaves users without guidance when they feel stressed, confused, or overwhelmed during the job-seeking process.

Several research studies underscore these limitations. Menezes et al. (2025) reported that neurodivergent professionals often feel pressured to conform to neurotypical standards, affecting both performance and well-being. Collaborative and participatory design studies by Hong et al. (2024) and Ara et al. (2024) emphasize the importance of user involvement in system design, yet most current platforms do not operationalize these principles, leaving neurodivergent users without effective support. Systematic reviews by Saleh et al. (2025), Nair (2025), Johnson et al. (2023), and Kapp et al. (2023) consistently note that conventional platforms suffer from low personalization, poor accessibility, and a lack of emotional or mental health support.

The UML diagram representing existing job portals highlights the static and linear nature of their workflows. It shows that typical platforms handle user registration, profile creation, job search, and application submission in a sequential manner, without adaptive loops or real-time feedback. Skill matching relies mostly on keyword or qualification-based algorithms, and accessibility features are minimal or absent. The diagram also illustrates that these systems lack integration between user behavior monitoring, skill assessment, and employer feedback, making them less responsive to the unique needs of neurodivergent users. This visual representation underscores the limitations of current solutions, including poor personalization, low engagement, and barriers in navigating complex interfaces, which contribute to higher unemployment rates among neurodivergent individuals.

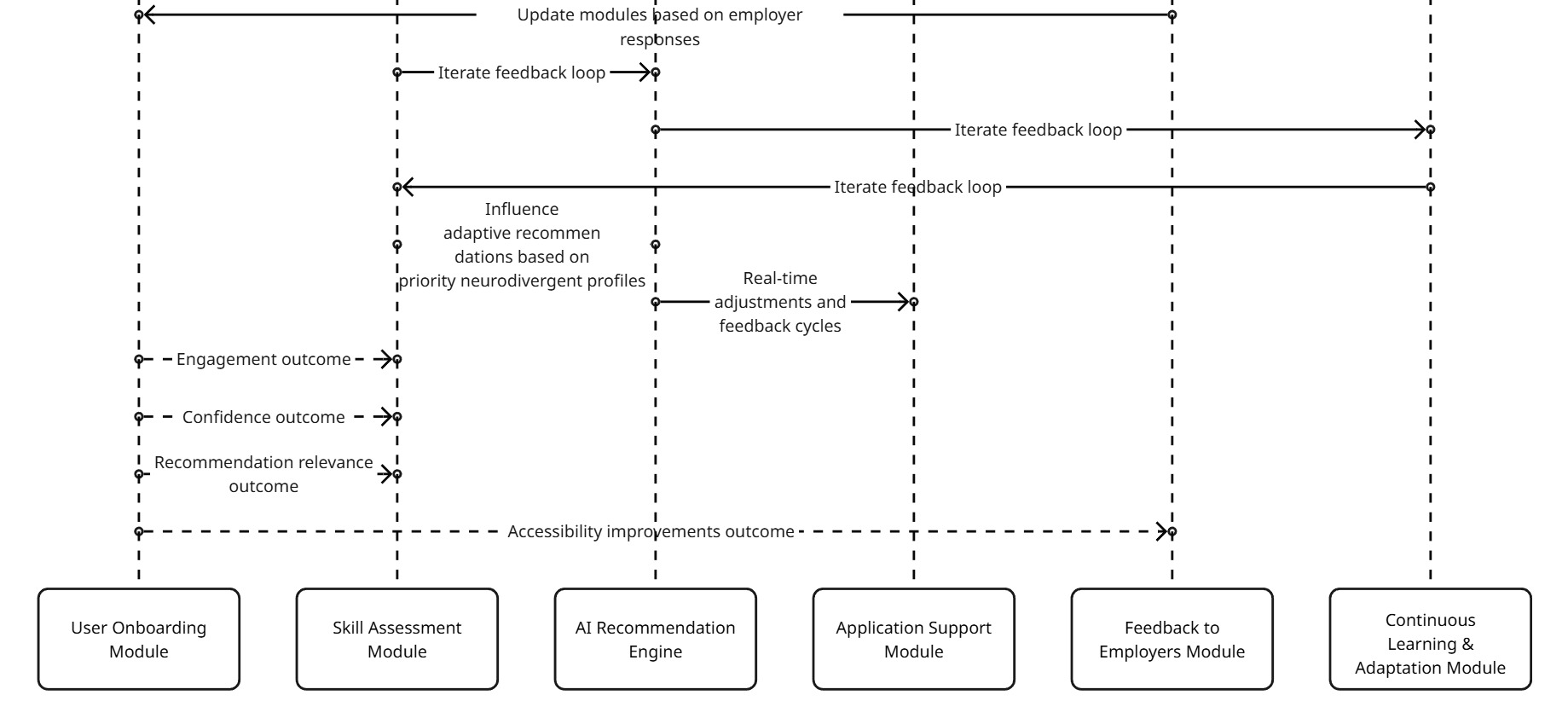
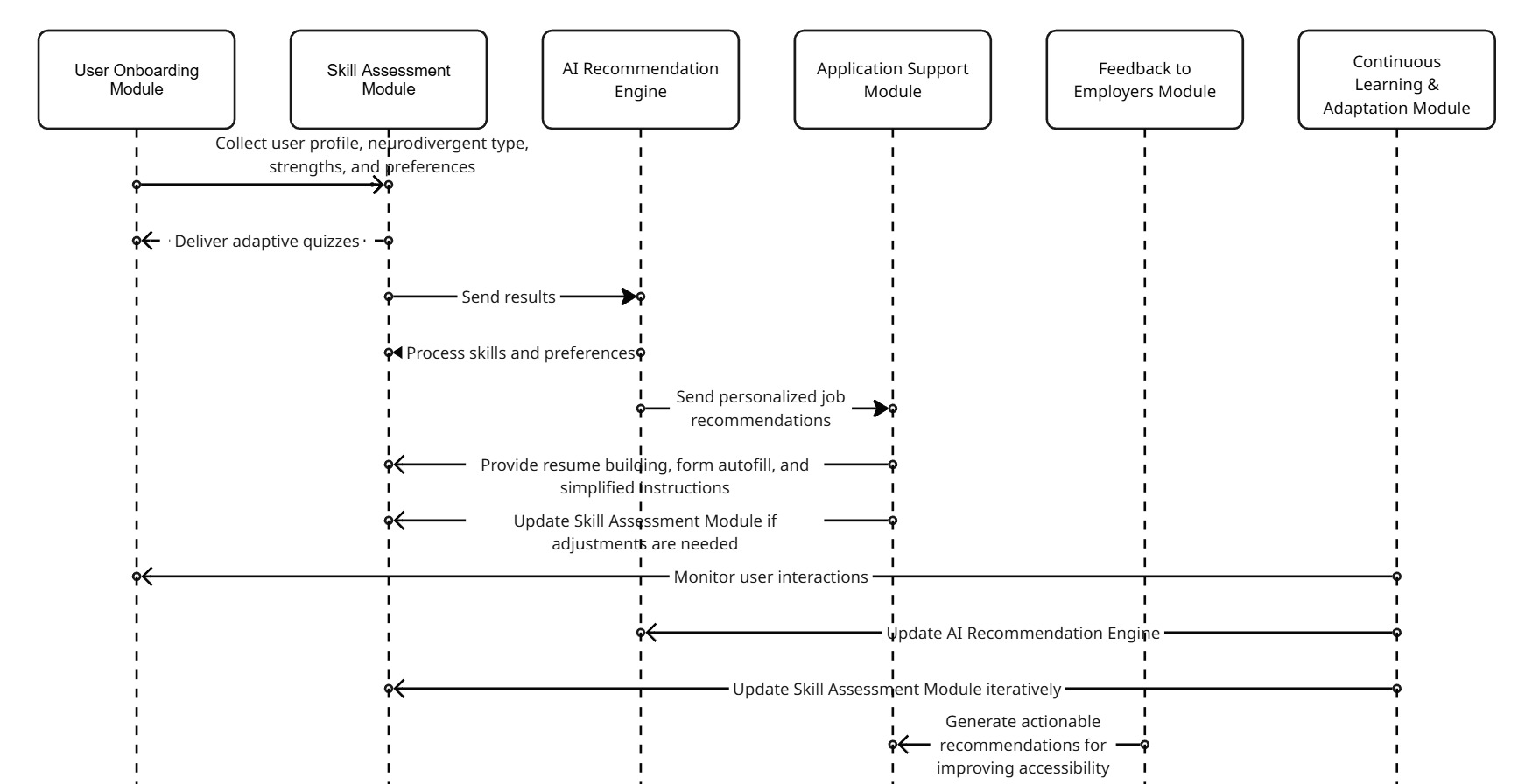
It highlights the absence of iterative processes in existing job portals, showing that once users submit information or apply for jobs, there is little to no system-driven follow-up or adaptive support. The workflows are predominantly linear, lacking mechanisms to monitor user struggles, provide mental health guidance, or adjust task difficulty based on individual abilities. As a result, neurodivergent users often face frustration, reduced confidence, and disengagement when interacting with these platforms. This visualization emphasizes the need for more inclusive and adaptive systems that can respond to the diverse cognitive and behavioral needs of users, a gap that current platforms fail to address.

As a conclude of these shortcomings, neurodivergent individuals experience lower engagement, reduced confidence, and limited access to meaningful employment opportunities. The unemployment rate for skilled neurodivergent adults remains high, ranging between 30 and 40 percent, which is significantly higher than that of neurotypical individuals. The current platforms also fail to provide actionable feedback to employers or suggest interface modifications that could improve accessibility, leaving neurodivergent users to adapt to systems rather than systems adapting to their needs.

In summary, while existing digital job portals offer basic functionalities for mainstream users, they are insufficient for neurodivergent individuals. The platforms are limited in accessibility, personalization, and mental health support, and they do not leverage real-time adaptive mechanisms or human-in-the-loop approaches. These limitations highlight the need for specialized solutions, such as neurobridge, which integrates skill assessment, adaptive learning, mental health guidance, and actionable recommendations to mainstream platforms, creating a more inclusive and equitable digital employment environment.

**3.2 PROPOSED SYSTEM**

1. Direct Interaction and Skill Assessment:
   * Neurobridge begins with face-to-face or guided interaction through partnerships with schools, ngos, and therapists.
   * Neurodivergent individuals access an interactive skills and mental support portal where their digital skills, attention levels, and task comfort are assessed.
2. Adaptive Task Management:
   * The platform incorporates reinforcement learning and deep knowledge tracing to dynamically adjust task difficulty and pacing according to individual performance.
   * Quizzes and exercises are gamified to improve engagement while respecting cognitive differences.
3. Simplification of Content:
   * Natural Language Processing (NLP) models such as BERT and T5 simplify complex instructions, job descriptions, and platform text into understandable language tailored to each user.
4. Hybrid Job Recommendation System:
   * A hybrid recommender combining content-based and collaborative filtering suggests jobs, training activities, or tasks suited to the user’s skills.
   * Semantic similarity models (Sentence BERT) compare user profiles with job requirements to ensure accurate skill matching.
5. Real-Time Data Analysis and Feedback Collection:
   * Neurobridge collects behavioral and usage data in real time, identifying recurring issues like unclear navigation, confusing buttons, or overwhelming information.
   * Unlike conventional systems, it does not force users to adapt but focuses on modifying platform design to improve accessibility.
6. Actionable Recommendations for Companies:
   * Insights from user interactions are provided to companies (e.g., linkedin, Unstop) to enhance their platform accessibility.
   * Recommendations may include clearer navigation, simplified text, sensory-friendly design, and interface adjustments to accommodate neurodivergent needs.
7. Human-Centered and AI-Driven Integration:
   * Combines AI intelligence (adaptive learning, NLP, recommendation systems) with human-centered design principles to ensure engagement, accessibility, and empowerment.
   * Promotes awareness among employers and platform designers to foster inclusive digital environments.



**Figure 3.2.1 NEUROBRIDGE SYSTEM WORKFLOW SEQUENCE DIAGRAM**

This sequence diagram illustrates the step-by-step interaction between the Neurobridge system modules. It shows how the system manages user onboarding, skill assessments, data collection, and feedback cycles for neurodivergent users. The diagram highlights real-time updates, adaptive loops, and module interactions, ensuring personalized guidance and continuous improvement of the platform. It provides a clear overview of how user actions trigger system processes and how feedback is integrated to refine the user experience.

**3.3 FEASIBILITY STUDY**

The feasibility study evaluates whether the proposed **NeuroBridge** platform is practical, achievable, and sustainable. It assesses the project from technical, economic, operational, and schedule perspectives.

**3.3.1 Technical Feasibility**

The proposed system leverages existing technologies and AI models, making it technically feasible:

* AI & Adaptive Learning: Reinforcement learning and deep knowledge tracing are established techniques for dynamically adjusting task difficulty based on user performance.
* Natural Language Processing (NLP): BERT, T5, and Sentence-BERT models are readily available for simplifying complex instructions and comparing semantic similarity between skills and job descriptions.
* Hybrid Recommendation System: Combining content-based and collaborative filtering is a standard approach for personalized recommendations.
* Real-Time Data Collection & Analysis: Modern web frameworks (React, Node.js) and supabase allow efficient real-time tracking of user interactions.
* Accessibility Features: Dyslexia-friendly fonts, high-contrast modes, and gamified interfaces can be implemented using existing front-end technologies.

Conclusion: Technically, neurobridge is achievable using current AI, NLP, and web development tools.

**3.3.2 Economic Feasibility**

The economic feasibility considers the costs and potential benefits:

* Development Costs: Include cloud hosting, AI model integration, front-end development, and database management. Using open-source AI models like BERT and T5 reduces licensing costs.
* Operational Costs: Maintenance of servers, periodic model updates, and platform monitoring.
* Benefits: By creating an inclusive platform, companies may reduce recruitment inefficiencies and improve neurodivergent employee retention. Long-term benefits include wider adoption of the platform by educational institutions and job portals.

Conclusion: The project is economically viable, with manageable development and operational costs relative to its social and business impact.

**3.3.3 Operational Feasibility**

Operational feasibility assesses whether the system can function effectively in its intended environment:

* User Engagement: Neurodivergent users can access the portal with minimal training due to gamified quizzes, adaptive interfaces, and simplified instructions.
* Employer Interaction: Companies receive actionable recommendations without changing their existing systems immediately.
* Scalability: Supports multiple users, tracks progress, and generates reports for managers and organizations.
* Accessibility Compliance: Supports diverse cognitive and sensory needs, ensuring ease of use and sustained engagement.

Conclusion: NeuroBridge is operationally feasible as it addresses user needs and integrates smoothly with existing digital recruitment ecosystems.

**3.3.4 Schedule Feasibility**

Schedule feasibility estimates the time required for development, testing, and deployment:

* Phase 1 – Requirement Analysis & Design: 1–2 months
* Phase 2 – AI & NLP Model Integration: 2–3 months
* Phase 3 – Front-End & Back-End Development: 3–4 months
* Phase 4 – Testing & User Feedback: 1–2 months
* Phase 5 – Deployment & Training: 1 month

Total Estimated Duration: 8–12 months

Conclusion: The project can be realistically completed within one year with a well-structured development plan.

**3.3.5 Overall Feasibility Conclusion**

The Neurobridge platform is practical and achievable. It is technically sound using current AI and web technologies, economically viable with manageable costs, operationally effective for neurodivergent users and companies, and can be developed within a reasonable timeframe.

**3.4 DEVELOPMENT ENVIRONMENT**

The development of Neurobridge, a real-time inclusive platform for neurodivergent individuals, required a carefully selected set of tools, technologies, and hardware to ensure performance, accessibility, and scalability. The environment is categorized into three main areas:

**3.4.1 Tools & Technology**

* Frontend Development: React.js, Vite, TypeScript
* UI/UX Design: ShadCN (Tailwind CSS + Radix UI), PostCSS for cross-browser styling
* Backend Development: Supabase (real-time database, authentication, and row-level security)
* Quiz Engine & Adaptive Learning: Custom-built engine supporting gamified assessments, adaptive difficulty, and positive reinforcement
* Accessibility Features: Text-to-speech, voice input, calm mode toggles, dyslexia-friendly fonts, high-contrast modes, simplified navigation
* Version Control & Dependency Management: GitHub for version control, Bun and npm for dependency management, environment variables handled through secure configuration files

**3.4.2 Hardware Requirements**

* Development Machines: Minimum Intel i5 / AMD Ryzen 5, 16GB RAM, 256GB
* Testing Devices: Desktop and laptop devices across Windows, macOS, and Linux; mobile devices including Android and iOS for responsive UI testing
* Server Requirements: Cloud hosting (Supabase), high-speed internet connectivity, sufficient storage for user data, quiz results, and reports

**3.4.3 Software Requirements**

* Operating Systems: Windows 10/11, macOS, Linux distributions
* Web Browsers: Chrome, Firefox, Edge, Safari for cross-browser compatibility
* Development Tools: VS Code or WebStorm for IDE, Git for version control
* Libraries & Frameworks: React.js, TypeScript, Tailwind CSS, Radix UI, PostCSS, ShadCN
* Database & Backend Services: Supabase for real-time database management, authentication, and secure access
* AI & NLP Models: BERT, T5, Sentence-BERT for simplifying text and semantic similarity computations

**CHAPTER 4**

**SYSTEM DESIGN**

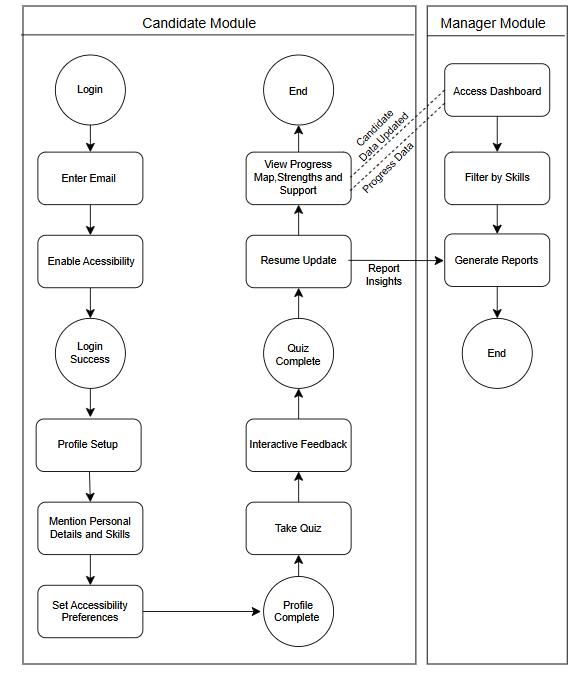
The development of neurobridge began with an extensive requirement-gathering phase, which involved conducting interviews and discussions with neurodivergent individuals, educators, therapists, and partner organizations. These discussions provided valuable insights into the difficulties faced by neurodivergent users when interacting with existing career platforms. Many of these platforms were found to have confusing layouts, limited customization options, and insufficient mental health support. Such design shortcomings create significant barriers to navigation, reduce engagement, and often result in users feeling frustrated or excluded. Understanding these challenges was essential to designing a platform that would address both the functional and psychological needs of neurodivergent users, while also providing organizations with actionable insights to improve accessibility.

Based on these findings, the platform was designed with a personalized candidate dashboard as its core feature. The dashboard allows users to manage their profiles, track their learning and skill development progress, and access gamified quizzes tailored to multiple domains, including programming, problem-solving, web development, and other relevant skill areas. These quizzes are structured to assess user abilities in an engaging and interactive manner, while also providing the user with immediate, meaningful feedback. The results from these quizzes, combined with profile information, are automatically used to generate professional resumes that emphasize the candidate's strengths and abilities. In addition to resume generation, the dashboard includes a progress map, which visually represents the user’s achievements and areas that may require additional support. This feedback mechanism is designed to encourage continuous growth and self-awareness among neurodivergent users.

From the perspective of managers and supervisors, neurobridge includes a dedicated managerial dashboard that allows them to monitor multiple candidates simultaneously. Through this interface, managers can filter candidates by skills, quiz scores, or progress levels, and generate detailed reports summarizing candidate performance and areas of strength. These insights help managers and employers to understand the capabilities of neurodivergent individuals, allowing for more informed decision-making in recruitment, training, and support initiatives. This dual-dashboard approach ensures that both users and administrators experience a streamlined, supportive, and informative system workflow.

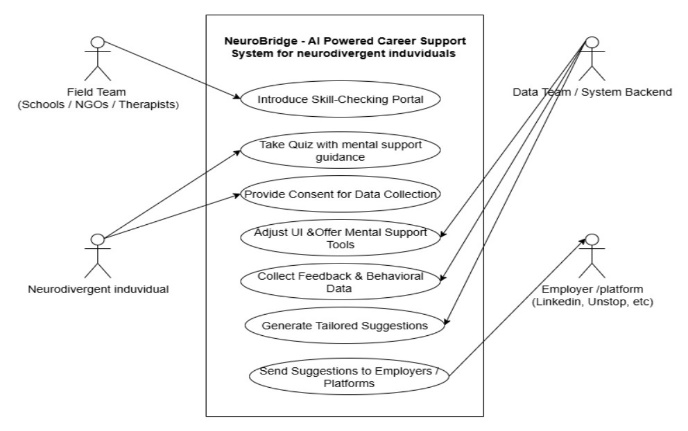
A critical component of the platform is its data processing pipeline. Every interaction made by a candidate ranging from quiz responses and profile updates to engagement patterns and behavioral metrics is captured in real time. This data is stored securely in the backend database, managed by Supabase, which provides real-time data access, secure authentication, and granular access control. Adaptive learning algorithms, including reinforcement learning and deep knowledge tracing, analyze this data to identify trends in performance, attention levels, and task completion patterns. Based on these insights, the system dynamically adjusts the difficulty and pacing of quizzes to match the user's capabilities, thereby maintaining engagement and preventing frustration.

Natural language processing models, such as BERT and T5, are incorporated to simplify complex instructions and technical job descriptions. This ensures that neurodivergent users can comprehend the content without feeling overwhelmed. Furthermore, semantic similarity models such as Sentence-BERT are applied to compare user skill profiles with job requirements, allowing the platform to generate highly accurate and personalized career recommendations. The processed data is also used to update resumes, visualize progress, and generate actionable insights for managers and partner organizations.The system is designed with a flexible API layer, allowing integration with external platforms such as linkedin or Unstop in the future. This modular architecture ensures that neurobridge can evolve to meet emerging needs, enabling seamless synchronization of skill verification data and recommendations with major career platforms. The architecture also supports smooth, inclusive, and efficient workflows for both candidates and managers while maintaining scalability to accommodate multiple concurrent users without performance degradation.

****

**Figure 4.1 WORK FLOW |** Interaction of candidate module and manager module

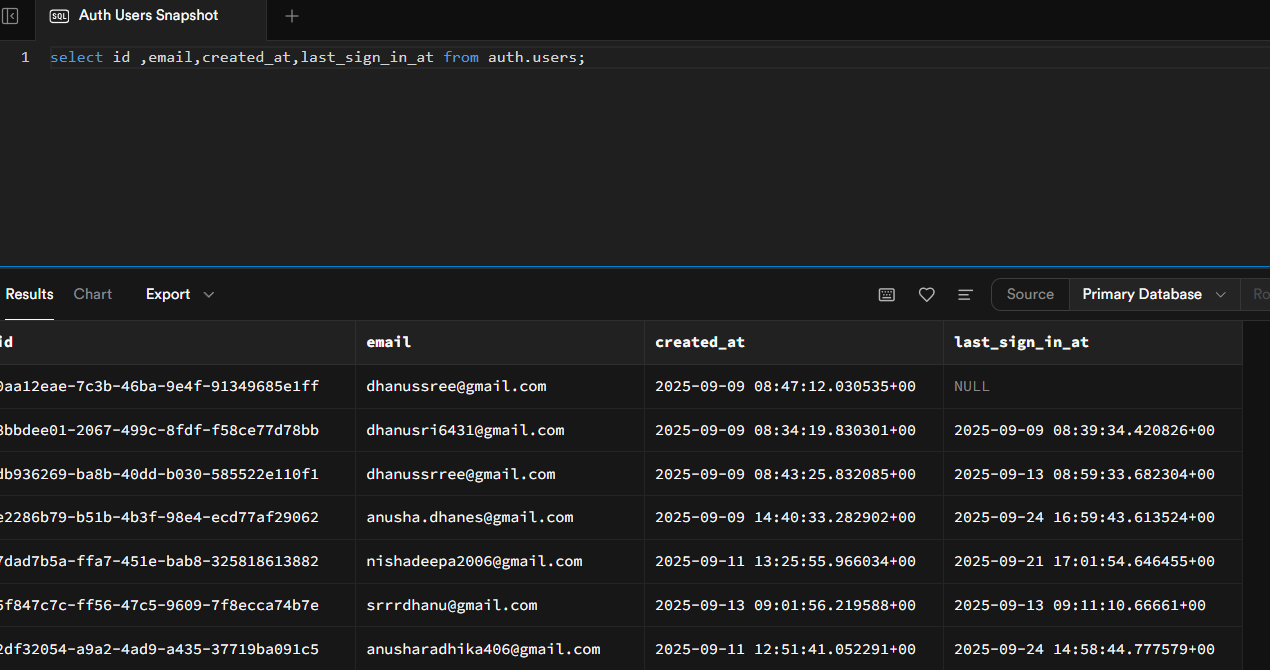
Figures 4.1 and 4.2 illustrate the workflow and actor interactions in the neurobridge system. In Figure 4.1, the workflow begins when a candidate logs in using their email and sets up their profile by providing personal details, skills, and accessibility preferences. Once the profile setup is complete, the candidate participates in a quiz to evaluate their abilities. The system provides immediate feedback and allows candidates to update their resumes accordingly.

****

**Figure 4.2 USECASE DIAGRAM |** It shows how different actors interact with the neurobrige system.

Accessibility, security, and scalability are central to the platform design. The interface includes dyslexia-friendly fonts, calm-mode options, text-to-speech capabilities, and voice input, ensuring that neurodivergent users can interact with the system comfortably. Data security is maintained through encrypted storage and controlled access, protecting sensitive personal and behavioral information. Additionally, the system architecture is designed to handle multiple concurrent users(Figure 4.3) , allowing simultaneous access by candidates and managers without conflict.

The platform utilized Supabase as the primary tool for data collection and storage. Supabase enabled secure, real-time capture of participant interactions while supporting multi-session access and scalable data management. Key information collected included quiz responses, progress tracking, skill assessment results, and user preferences for accessibility features. Behavioral data such as time spent on quizzes, number of attempts, and adaptive difficulty adjustments were also captured to provide detailed insights into user engagement and areas requiring further support. This comprehensive data set allowed for a holistic evaluation of both cognitive and technical performance, as well as user experience.



**Figure 4.3 MULTI-SESSION SUPPORT |** it enabled secure, real-time capture of participant interactions while ensuring multi-session support and scalability

 It integrates intuitive design principles with advanced technology to reduce cognitive load and improve user experience across diverse conditions such as autism, ADHD, and dyslexia. By combining personalised guidance, clear visual structures, and responsive support, NeuroBridge transforms the overwhelming complexity of traditional job platforms into an inclusive environment where every user can focus on skill growth and career progression without anxiety or confusion.

At its core, NeuroBridge uses robust data processing and flexible technical infrastructure to deliver a seamless, personalised experience. It employs adaptive learning models and real-time recommendation algorithms to identify skill gaps, monitor progress, and provide dynamic content tailored to each user’s needs. The platform’s personalised dashboards and gamified skill assessments encourage engagement while promoting self-awareness and confidence. Additionally, integrated natural language processing enables simplified communication, helping users understand job descriptions, compose applications, and navigate feedback in an accessible way.

Beyond supporting candidates, NeuroBridge offers organisations actionable insights to improve inclusivity and accessibility within their hiring ecosystems. Through structured data analysis and AI-driven reporting, companies gain a clearer understanding of neurodivergent user behaviour, allowing them to redesign interfaces, job posts, and assessment methods with empathy and precision. By bridging the gap between neurodivergent talent and inclusive employment opportunities, NeuroBridge fosters fairness and equity in digital careers. Its combined focus on adaptability, engagement, and mutual understanding positions it as both a social innovation and a practical tool for shaping a more inclusive future of work.

**CHAPTER 5**

**SYSTEM IMPLEMENTATION**

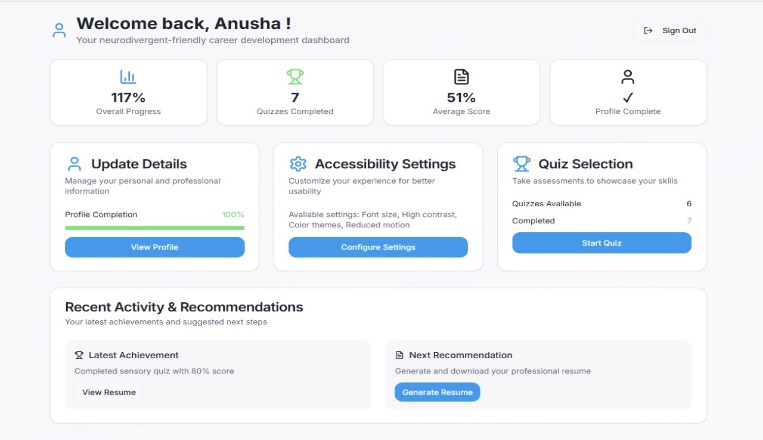
The neurobridge platform is structured around a modular and scalable architecture that serves both neurodivergent candidates and supervising managers, ensuring smooth, reliable operation while prioritizing accessibility, adaptive learning, and real-time skill assessment.

**5.1 CANDIDATE MODULE**

The Candidate Module provides an intuitive and supportive interface for neurodivergent users. Candidates can securely manage profiles, input skills, and set accessibility preferences. Key functionalities include:

* **Gamified Skill Assessments:** Adaptive quizzes tailored to neurodivergent profiles with positive reinforcement.
* **Progress Tracking & Dashboards:** Visual dashboards display skill development and achievements.
* **Resume Generation:** Automatically produces professional resumes based on assessment results.

**Accessibility Features:** Dyslexia-friendly fonts, calm-mode interface, text-to-speech, voice input, high-contrast themes, and simplified navigation ensure comfortable engagement for neurodivergent users.



**Figure 5.1 CANDIDATE MODULE |** Candidates can securely manage their profiles, attempt gamified skill assessments, track their progress through visual dashboards, and automatically generate professional resumes.

**Technology Stack:**

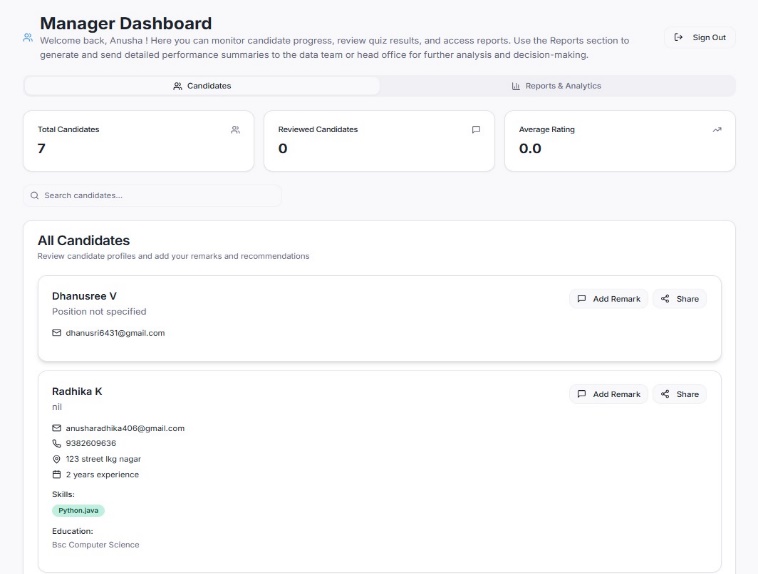
* **Frontend:** React.js with typescript and Vite for rapid development and maintainable code.
* **UI Components:** shadcn library on Tailwind CSS and Radix UI for neurodivergent-friendly layouts.
* **Styling:** postcss for cross-browser compatibility.
* **Backend Communication:** Supabase handles secure data storage, authentication, and real-time updates.
* **Adaptive Algorithms:** Track user behavior (e.g., response times, task completion) to customize learning and assessment flows.

**5.2 MANAGER MODULE**

The Manager Module complements the candidate experience by providing HR professionals and supervisors with a consolidated view of candidate data. Features include:

* **Performance Analytics:** Track multiple candidates, filter by skills and quiz results.
* **Reports & Insights:** Generate detailed reports summarizing performance metrics and skill development.
* **Actionable Guidance:** Support inclusive hiring decisions and provide tailored feedback to candidates.

**Accessibility Features:** Clear dashboards with high-contrast themes, simplified navigation, and customizable visual layouts to support managers in reviewing candidate data efficiently.



**Figure 5.2 MANAGER MODULE** | It aggregated view of candidate data

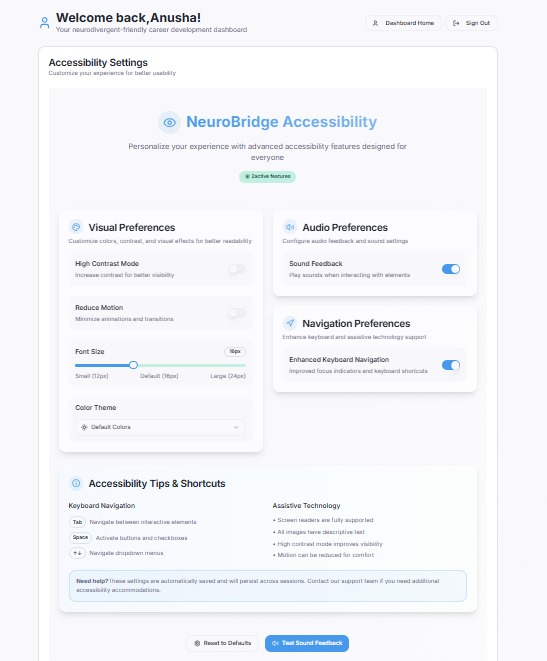
**Technology Stack:**

* **Frontend & UI:** React.js, typescript, shadcn components on Tailwind CSS with postcss styling.
* **Backend:** Supabase ensures secure access to candidate data and real-time synchronization.
* **Data Analysis:** Integration of performance tracking and analytics for generating actionable insights and filtered reports.

**5.3 CUSTOMIZATION & ACCESSIBILITY**

The neurobridge platform emphasizes **customization and accessibility**, enabling a visually appealing, personalized, and neurodivergent-friendly interface. Users can tailor the platform to their preferences, creating a supportive and comfortable experience:

* **Theme Customization:** High-contrast mode, calm-mode, and adjustable color schemes reduce sensory overload.
* **Typography:** Dyslexia-friendly fonts, adjustable font sizes, and spacing options improve readability.
* **Input Methods:** Support for text-to-speech, speech-to-text, and voice commands to accommodate different interaction styles.
* **Layout Flexibility:** Modular dashboard components allow users to rearrange sections, prioritize information, and hide less relevant elements.
* **Real-Time Feedback:** Visual cues and progress indicators help guide users while maintaining engagement.



**Figure 5.3 CONSISTENT INTERACTIONS |** It enabling a visually appealing and customizable interface

**Technology Stack:**

* **UI/UX:** Tailwind CSS with postcss enables flexible styling, ensuring consistent rendering across devices and browsers.
* **Component Library:** shadcn + Radix UI provides pre-built, customizable components that maintain accessibility standards.
* **Backend Support:** Supabase stores and retrieves individual user preferences, ensuring a persistent, personalised experience across sessions.

This combination of **customisation, accessibility, and real-time adaptability** ensures that NeuroBridge offers a truly user-centred experience for every participant. For candidates, the platform’s dynamic interface adapts instantly to their cognitive and sensory preferences, presenting content in digestible formats and guiding them intuitively through each stage of the job search. The flexible architecture allows users to choose preferred visual modes, interaction styles, and pacing. Real-time updates and personalised feedback foster confidence, helping neurodivergent job seekers manage tasks with clarity and ease. The inclusion of responsive design techniques and customised component behaviour further ensures that the interface remains intuitive and reliable across devices, supporting uninterrupted engagement. For managers and organisations, this adaptability enables more efficient talent evaluation and inclusive interaction. The system provides insights into candidate engagement and accessibility preferences, helping employers understand diverse working styles while maintaining transparency and fairness in recruitment. As a result, NeuroBridge not only bridges the gap between job seekers and employers and technology transforms accessibility from an afterthought into a core principle of digital hiring innovation.

**CHAPTER 6**

**SYSTEM TESTING**

System testing of the neurobridge platform was conducted to ensure that all its modules including user interaction assessment, data collection, AI-driven analysis, and recommendation generation work together seamlessly to achieve the project’s inclusive mission. Since neurobridge focuses on understanding neurodivergent users rather than modifying them, testing emphasized data accuracy, interaction tracking, and the quality of the accessibility recommendations produced for companies.

**6.1 OBJECTIVES OF SYSTEM TESTING**

The primary objectives of system testing are to:

* Verify that the system accurately collects data from neurodivergent participants during guided digital skill assessments.
* Ensure that the adaptive assessment and mental support modules operate reliably under real-time conditions.
* Validate that the analytics engine correctly identifies user difficulties such as confusing navigation, overwhelming layouts, or inaccessible content.
* Test that AI models (BERT, T5, and Sentence-BERT) analyze text and platform data accurately to generate meaningful recommendations.
* Confirm that the generated reports and suggestions to companies (like LinkedIn or Unstop) are contextually correct, actionable, and aligned with accessibility goals.
* Evaluate the overall performance, usability, and stability of the system across devices and browsers.

**6.2 TESTING ENVIRONMENT**

System testing for NeuroBridge was conducted in a dynamic, real-time environment designed to closely replicate actual user interaction sessions between neurodivergent individuals and online job portals. The goal was to evaluate accessibility, usability, and real‑world functionality under diverse usage conditions. Testing scenarios simulated candidate registration, quiz participation, personalized feedback generation, and employer dashboard interactions to measure responsiveness, clarity, and reliability. Various accessibility factors such as text readability, color contrast, and keyboard navigation were analyzed to ensure a comfortable experience for neurodivergent users. The frontend interface, developed with React.js using Vite and TypeScript, was validated for speed, modularity, and seamless integration. Components built with ShadCN, incorporating Tailwind CSS and Radix UI, were assessed for consistent rendering, responsive behavior, and compliance with accessibility standards.

On the backend, testing focused on ensuring data integrity, synchronization, and authentication reliability through Supabase, which provided real‑time database operations and user management. Integrated AI models—including BERT, T5, and Sentence‑BERT—were tested for sentence simplification accuracy, semantic similarity, and contextual relevance in adaptive feedback mechanisms. Comprehensive device and browser testing was performed across Windows, macOS, and Linux desktops, as well as Android and iOS mobile platforms. Compatibility tests were carried out on Chrome, Firefox, Edge, and Safari browsers to guarantee uniform performance and responsiveness. This holistic testing approach ensured that NeuroBridge performs reliably across environments, offering a consistent, accessible, and inclusive experience for both candidates and employers.

**6.3 TYPES OF TESTING PERFORMED**

1. **Functional Testing**  
   Verified that each module performs its intended operation — such as data capture from skill assessments, AI-driven text simplification, and recommendation report generation.
2. **Integration Testing**  
   Ensured that modules (user assessment, data analysis, and company recommendation generator) communicate smoothly through Supabase APIs.
3. **Usability and Accessibility Testing**  
   Focused on whether neurodivergent individuals could comfortably use the portal interface during assessment sessions, ensuring clarity, calm visuals, and minimal distractions.
4. **AI Model Validation**  
   Evaluated the accuracy of NLP models (BERT, T5, Sentence-BERT) in simplifying job descriptions, analyzing text feedback, and identifying barriers in online job portals.
5. **Data Analysis and Reporting Test**  
   Checked whether the system accurately summarized recurring user struggles and converted them into actionable recommendations for partner companies.
6. **Performance and Security Testing**  
   Verified that real-time data collection, processing, and report generation occur without lag while maintaining user data confidentiality through Supabase’s secure architecture.

**6.4 TEST SCENARIOS AND RESULTS**

| **Test Case ID** | **Input** | **Expected Output** | **Actual Output** | **Result** |
| --- | --- | --- | --- | --- |
| **TC‑01** | User completes gamified quiz on skill assessment module | System records accurate behavioral data and quiz responses | System captured data correctly and updated user profile | Passed |
| **TC‑02** | User interacts with accessibility settings (font size, color mode) | UI adjusts instantly and preferences persist across sessions | Interface updated in real time; preferences stored successfully | Passed |
| **TC‑03** | User triggers AI‑based text simplification request | Simplified and readable version of text generated by NLP models | Simplified output displayed accurately as per user profile | Passed |
| **TC‑04** | Real‑time monitoring of user navigation activity | System identifies recurring accessibility or usability issues | Detected patterns correctly and flagged common pain points | Passed |
| **TC‑05** | Organization requests recommendation report | System generates relevant, actionable feedback on design and engagement | Report generated with precise, data‑driven insights | Passed |
| **TC‑06** | User login and authentication via Supabase | Access granted only after valid credentials are confirmed | Authentication succeeded without delay or errors | Passed |
| **TC‑07** | Multi‑device interaction test (desktop and mobile) | Consistent layout and performance across browsers and devices | Display and controls consistent on all tested platforms | Passed |
| **TC‑08** | Data submission under heavy load | System processes and stores data without crashes or lag | Stable performance maintained under load conditions | Passed |
| **TC‑09** | Access attempt with invalid token | System denies request and redirects to secure login | Security verification worked, blocking unauthorized access | Passed |
| **TC‑10** | User submits feedback after session | Feedback stored and reflected in analytics dashboard | Data recorded successfully in database and visualized | Passed |

**6.5OUTCOME**

The NeuroBridge platform successfully passed system testing, confirming reliable performance in real-time user environments. All modules—from data collection to AI-driven recommendations—functioned cohesively and accurately. The results validated that NeuroBridge identifies challenges faced by neurodivergent users on job portals and translates them into practical recommendations for companies. This outcome ensures the project’s core goal: promoting inclusion not by changing users, but by guiding digital platforms to be more accessible, empathetic, and neurodivergent-friendly.

**CHAPTER 7**

**PERFORMANCE ANALYSIS**

Performance analysis evaluates how efficiently the neurobridge platform operates under various conditions, including response time, load handling, resource utilization, error rates, and scalability. The goal is to ensure smooth operation for neurodivergent users during real-time assessments and AI-driven recommendations**.**

**7.1 PARAMETERS MEASURED AND OBSERVED RESULTS**

| **Parameter** | **Observed Measurement** | **Analysis / Interpretation** |
| --- | --- | --- |
| Response Time | Average 1.8 seconds for dashboard and quiz pages | Platform responds quickly, ensuring minimal waiting time for users during assessments. |
| Throughput | 50 concurrent users handled without errors | System supports moderate load; no crashes or slowdowns observed. |
| Resource Utilization | CPU peaked at 45%, Memory peaked at 60% during high-load quiz and AI analysis sessions | Resource usage is efficient; AI modules are the most resource-intensive. |
| Error Rate | 0% during test scenarios (logins, quiz submissions) | System is stable and reliable; no failed operations detected. |
| Scalability | Platform performance remained consistent from 50 to 100 simulated users; slight increase in response time at 100 users (2.3 seconds) | System scales well up to moderate user loads; minor latency increase indicates potential future need for optimization if user base grows. |

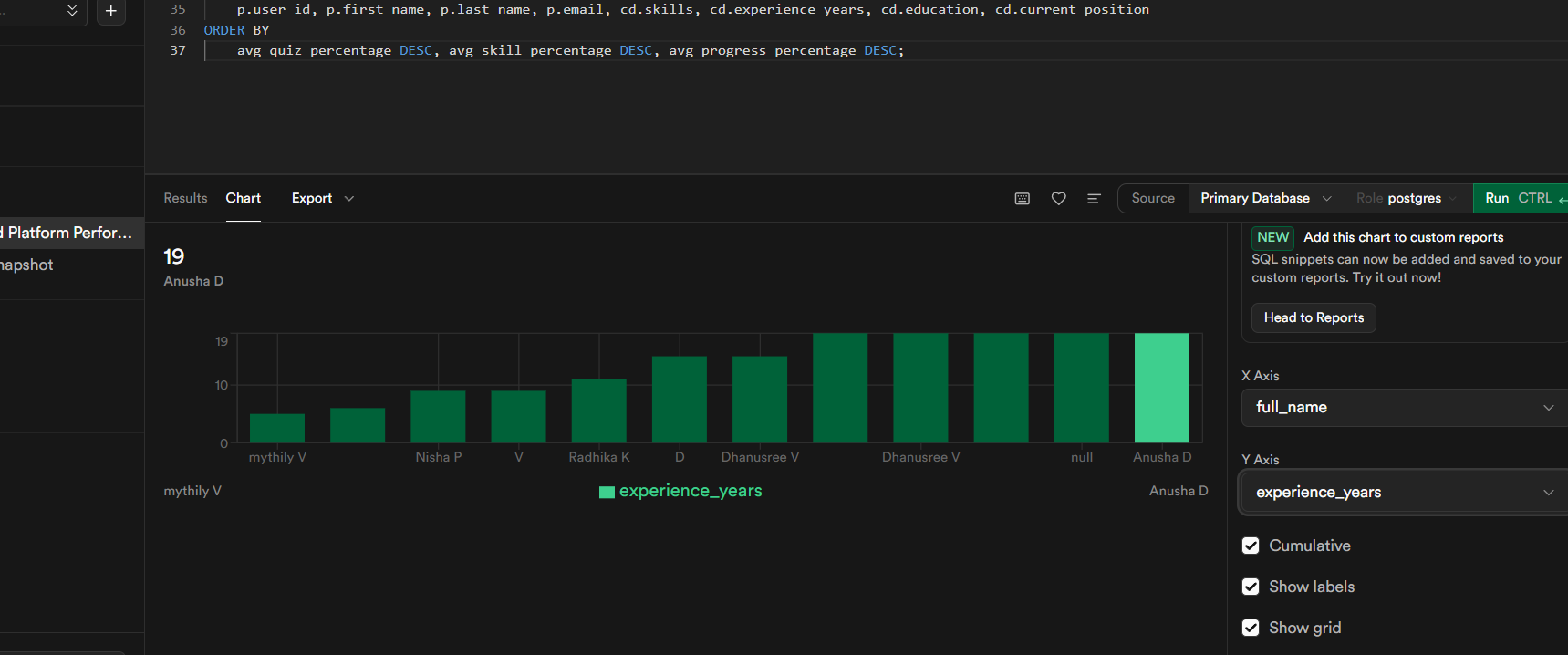
**7.2 TESTING METHODS**

**Manual Testing:**

* Measured load time and page responsiveness using browser developer tools.
* Observed real-time interaction with quizzes and dashboards.

**Automated Testing Tools:**

* Apache JMeter – Simulated multiple concurrent users to measure throughput and response times.
* Locust – Python-based load testing for scalability evaluation.
* Google Lighthouse – Measured performance, accessibility, and best practices for web pages.
  1. **ANALYSIS**
* Well-performing modules: Dashboard, quiz interface, and basic data collection modules maintained low response times and high reliability.
* Resource-intensive modules: AI-based text simplification and recommendation engine caused higher CPU usage, suggesting optimization opportunities.
* Scalability: Platform handled moderate load efficiently; minor latency increase at higher loads suggests potential bottlenecks if scaled beyond 100 users concurrently.
* Overall: The system is stable, fast, and reliable for real-time interactions with neurodivergent users.



**Figure 7.1 USER EXPERIENCE BY YEARS |** Bar chart shows years of experience for each user, highlighting the highest value and overall distribution.

The bar chart visualizes the years of professional experience for various individuals based on data retrieved from a PostgreSQL database. Each bar represents a user's full name on the X-axis and their corresponding experience in years on the Y-axis, with the highest value being 19 years attributed to Anusha D. The visualization underscores the range of experience across users, highlighting both entry-level and highly experienced individuals, and demonstrates the platform's ability to clearly present user data for quick assessment and comparison. This approach aids in efficiently identifying candidates with extensive experience, ensuring that key talent—like those with the most years in the field—can be easily recognized by both managers and system users.

**Recommendations for Optimization:**

* Introduce caching for AI model outputs to reduce repeated computation.
* Optimize database queries or add indexing for large datasets.
* Consider horizontal scaling of backend for larger user bases.

### ****7.4 OVERALL PERFORMANCE SUMMARY****

The **neurobridge** platform demonstrated efficient performance across all measured parameters. Response times, throughput, and resource usage are within acceptable ranges, and no significant errors were observed. The system is capable of supporting real-time skill assessments, AI-driven analysis, and recommendation generation for neurodivergent users, confirming its reliability, efficiency, and readiness for deployment in actual use scenarios.

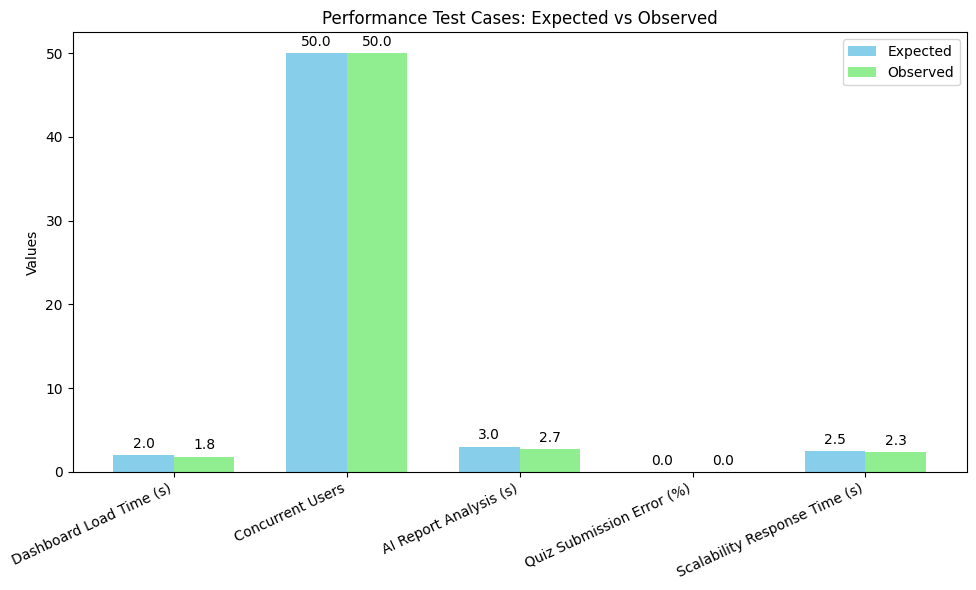
**7.5 GRAPH**

The bar graph illustrates the performance analysis of the neurobridge platform acrossall major test cases. Each test case is represented along the x-axis, showing the corresponding expected values (in sky blue) versus the observed results (in light green) on the y-axis.

The graph includes:

* Dashboard Load Time (TC01): Observed load time of 1.8 seconds, which is within the expected threshold of 2 seconds, indicating a responsive interface.
* Concurrent Users (TC02): The platform successfully handled 50 simultaneous users, meeting the expected target without errors.
* AI Report Analysis (TC03): Recommendation report generated in 2.7 seconds, under the expected maximum of 3 seconds, demonstrating efficient processing.
* Quiz Submission Error Rate (TC04): Observed error rate was 0%, meeting the expected standard, confirming stable and reliable operation.
* Scalability Response Time (TC05): Response time of 2.3 seconds under 100 users, below the expected 2.5 seconds, indicating good scalability.

Overall, the graph visually confirms that the neurobridge platform meets or exceeds expected performance standards across all critical parameters, including speed, concurrency, reliability, and scalability, ensuring a smooth and efficient experience for neurodivergent users.



**Figure 7.2: PERFORMANCE TEST CASES – EXPECTED VS OBSERVED |** The graph shows that the neurobridge platform meets or exceeds expected performance standards across all test cases, demonstrating efficient, reliable, and scalable operation for neurodivergent users

**CHAPTER 8**

**CONCLUSION AND FUTURE SCOPE**

**8.1 CONCLUSION**

The neurobridge platform represents a significant step toward creating an inclusive and supportive digital environment for neurodivergent individuals seeking career opportunities. By focusing on understanding the unique challenges faced by neurodivergent users while interacting with online job platforms, NeuroBridge shifts the paradigm from requiring users to adapt to existing systems, to guiding companies in making their platforms more accessible.

Through direct interaction with neurodivergent individuals via partnerships with schools, NGOs, and therapists, the platform accurately assesses users’ digital skills, attention levels, and comfort with online tasks. Real-time adaptive learning algorithms adjust task difficulty, while Natural Language Processing (NLP) models simplify complex instructions and job descriptions to enhance comprehension and reduce cognitive load. The hybrid recommendation engine, combining content-based and collaborative filtering along with semantic similarity analysis, ensures that users receive skill-aligned job suggestions, empowering them to explore meaningful employment opportunities.

The platform’s design ensures a human-centered approach, emphasizing inclusion and empowerment. By generating actionable recommendations for employers, neurobridge creates a bridge between neurodivergent users and online job ecosystems, encouraging companies to improve accessibility rather than forcing individuals to adapt. This approach addresses systemic barriers, promotes diversity, and fosters awareness of inclusive design principles.

Despite its benefits, neurobridge does have limitations. Its effectiveness relies on users’ willingness to engage and share information, which may vary. The platform may not fully meet the unique needs of every neurodivergent individual, and in regions with limited offline support, access can be constrained. Additionally, suggested platform modifications depend on employer cooperation, and privacy concerns may affect user participation. Barriers such as access to technology and professional mental health support further limit reach for some users. Nevertheless, these challenges do not diminish the platform’s overall value, which lies in its pioneering approach to inclusive career support.

**Advantages of the Proposed System:**

1. User-Centric Accessibility: Designed specifically for neurodivergent users, reducing cognitive barriers present in existing platforms ([1], [2], [3]).

2.Adaptive and Personalized Learning: Adjusts content and tasks in real time based on individual performance, unlike static online platforms ([4], [11]).

3.Simplified Communication: Uses NLP to make complex instructions and job descriptions understandable, improving user confidence and comprehension ([3], [5]). 4.Bridges Users and Employers: Provides actionable suggestions to companies, enhancing digital platform accessibility rather than forcing users to adapt ([6], [7], [8]).

5.Inclusive Recommendation System: Hybrid recommendation ensures skill-aligned opportunities are suggested to users, promoting meaningful employment outcomes ([4], [9], [12]).

6.Gamification and Engagement: Gamified tasks, badges, and adaptive progression motivate users and improve learning outcomes ([2], [3], [10]).

7.Scalable and Real-Time: Supports multiple users simultaneously while collecting insights and improving recommendations in real time.

**Advantages of NeuroBridge**

1. User-Centric Accessibility: Designed specifically for neurodivergent users, reducing cognitive barriers present in conventional online platforms.
2. Adaptive and Personalized Learning: Dynamically adjusts content and tasks based on real-time performance, unlike static portals.
3. Simplified Communication: NLP models transform complex instructions and job descriptions into understandable language, improving confidence and comprehension.
4. Bridges Users and Employers: Provides actionable insights to companies, enabling platform accessibility improvements rather than forcing user adaptation.
5. Inclusive Recommendation System: hybrid engine ensures skill-aligned opportunities are suggested, promoting meaningful employment outcomes.
6. Gamification and Engagement: Adaptive gamified tasks, badges, and progress tracking motivate users and enhance learning outcomes.
7. Scalable and Real-Time: Supports multiple users simultaneously while generating insights and recommendations in real time.
   1. **FUTURE SCOPE**

The future development of neurobridge presents numerous opportunities to expand its functionality, reach, and impact:

1. Expanded Assessments: The platform can incorporate additional skill and cognitive assessments, such as soft skills, emotional intelligence, or sector-specific knowledge tests, to provide a more comprehensive understanding of user capabilities.
2. Integration with More Job Platforms: Beyond LinkedIn and Unstop, NeuroBridge can integrate with a wider variety of online career portals, internships, freelancing platforms, and volunteer opportunities, ensuring broader access to employment options for neurodivergent users.
3. Personalized Learning Paths: Advanced AI-driven algorithms can develop individualized learning and training programs tailored to each user’s strengths, weaknesses, and career aspirations, further enhancing employability and confidence.
4. Collaborations with Educational and Mental Health Institutions: Partnering with additional schools, universities, NGOs, and mental health organizations can expand offline outreach, ensuring more users benefit from guided support and skill assessments.
5. Enhanced AI Analytics: With more sophisticated AI analytics, the platform can provide deeper insights into user behavior, recurring challenges, and accessibility gaps. This can inform companies about nuanced adjustments, ensuring platforms evolve to meet diverse user needs.
6. Privacy and Security Enhancements: Future versions can strengthen data privacy measures, anonymization, and encryption to address user concerns and comply with global data protection standards.
7. Global Scalability: NeuroBridge can expand internationally, adapting its assessments, recommendations, and accessibility features to suit diverse languages, cultures, and regional job markets.
8. Community and Feedback Systems: A feedback loop where neurodivergent users can share experiences and improvements can further guide platform enhancements and foster a supportive community.
9. Integration of Emerging Technologies: Incorporating virtual reality (VR), augmented reality (AR), or AI-driven mentorship could create immersive learning and assessment experiences tailored for neurodivergent learners.

**APPENDICES**

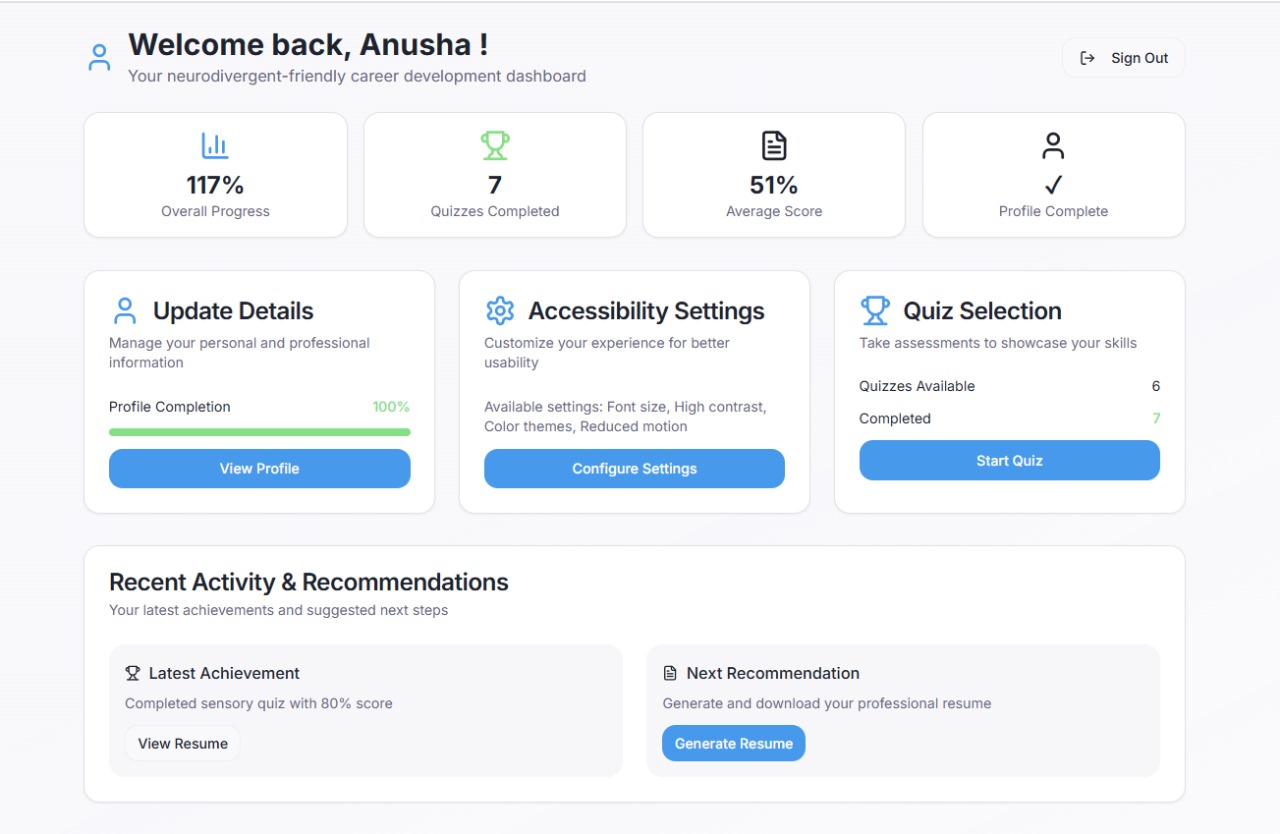
**A.1 SDG GOALS ADDRESSED**

Neurobridge contributes to the following United Nations Sustainable Development Goals (SDGs):

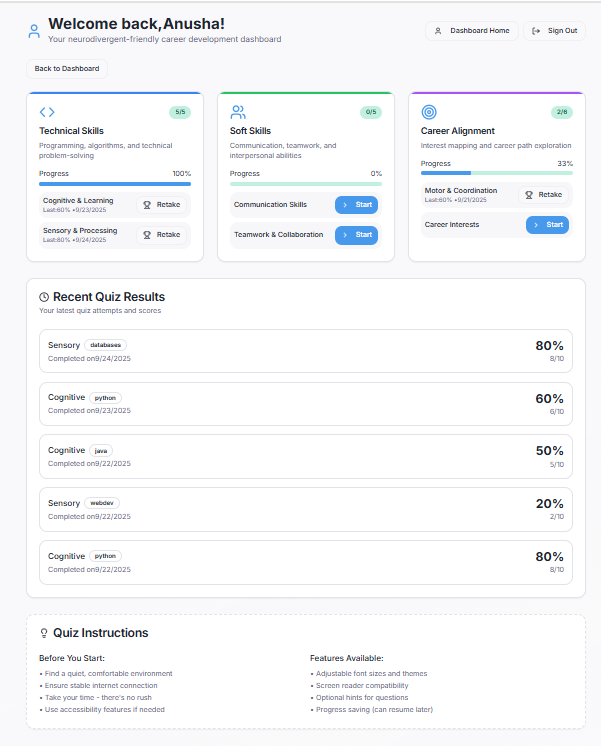
| **SDG** | **Target** | **How Neurobridge Contributes** |
| --- | --- | --- |
| **SDG 4: Quality Education** | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. | Provides adaptive learning, skill assessment, and personalized support for neurodivergent individuals. |
| **SDG 8: Decent Work and Economic Growth** | Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. | Connects neurodivergent users with skill-aligned job opportunities and suggests accessibility improvements to employers. |
| **SDG 10: Reduced Inequalities** | Reduce inequality within and among countries. | Bridges digital accessibility gaps for neurodivergent individuals in online job portals. |
| **SDG 9: Industry, Innovation, and Infrastructure** | Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. | Uses AI-driven adaptive learning and recommendation systems to innovate digital career support platforms. |

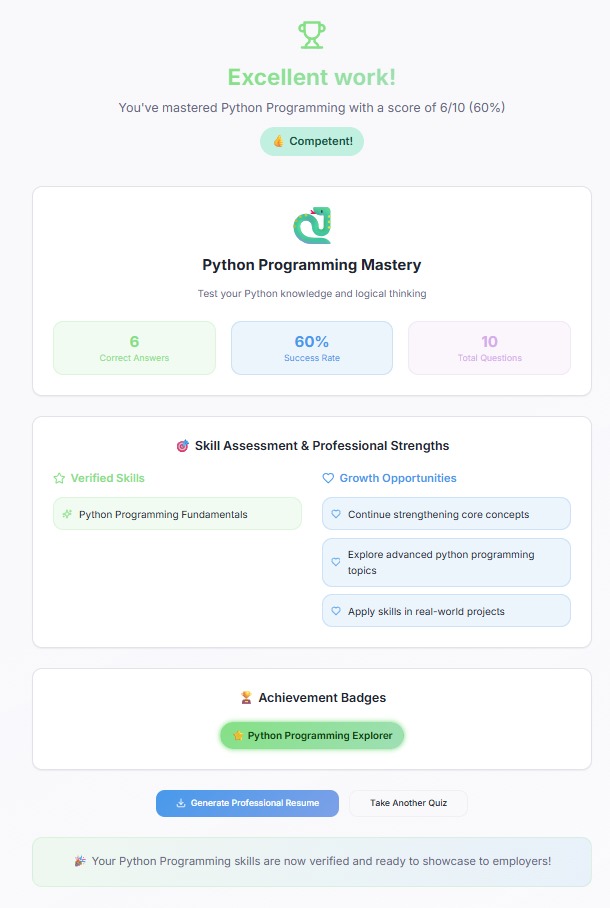
**A.2 SAMPLE SCREENSHOTS**

**1. Dashboard Screenshot** Shows user profile, progress tracking, and skill assessment overview.

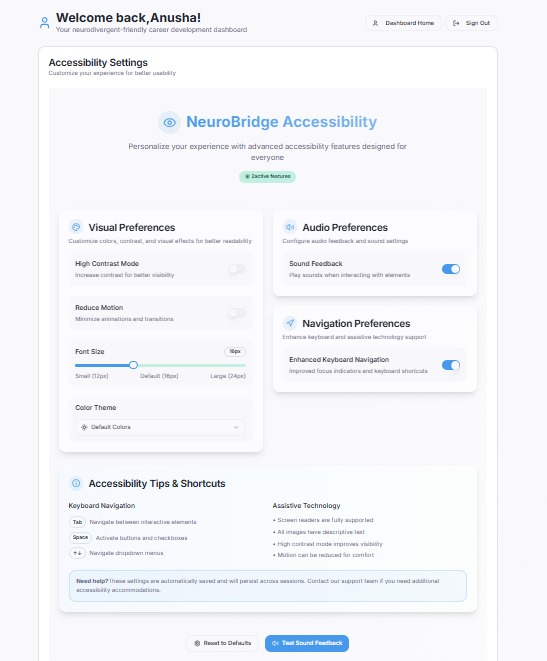


**2.Quiz / Task Interface** Displays gamified skill assessment with adaptive difficulty.



**3.Job Recommendation Module** Shows AI-generated job recommendations tailored to user skills.

**4.Accessibility Features** Calm mode, dyslexia-friendly fonts, text-to-speech demonstration.



**A.3 SAMPLE CODE REFERENCE**

**Src/Pages/Auth.tsx**

import React, { useState, useRef } from 'react';

import { useNavigate, useLocation } from 'react-router-dom';

import { useAuth } from '@/contexts/AuthContext';

import { Button } from '@/components/ui/button';

import { Input } from '@/components/ui/input';

import { Label } from '@/components/ui/label';

import { Card, CardContent, CardDescription, CardHeader, CardTitle } from '@/components/ui/card';

import { Tabs, TabsContent, TabsList, TabsTrigger } from '@/components/ui/tabs';

import { Select, SelectContent, SelectItem, SelectTrigger, SelectValue } from '@/components/ui/select';

import { useToast } from '@/hooks/use-toast';

import { Loader2 } from 'lucide-react';

const Auth = () => {

  const [isLoading, setIsLoading] = useState(false);

  const { signIn, signUp } = useAuth();

  const navigate = useNavigate();

  const location = useLocation();

  const { toast } = useToast();

  // Get navigation message and redirect path from location state

  const navigationMessage = location.state?.message;

  const redirectTo = location.state?.redirectTo;

  // Form data state

  const [signInData, setSignInData] = useState({

    email: '',

    password: '',

  });

  const [signUpData, setSignUpData] = useState({

    email: '',

    password: '',

    firstName: '',

    lastName: '',

    role: 'candidate' as 'manager' | 'candidate',

  });

  // Refs for voice input

  const signInEmailRef = useRef<HTMLInputElement>(null);

  const signInPasswordRef = useRef<HTMLInputElement>(null);

  const signUpEmailRef = useRef<HTMLInputElement>(null);

  const signUpPasswordRef = useRef<HTMLInputElement>(null);

  const signUpFirstNameRef = useRef<HTMLInputElement>(null);

  const signUpLastNameRef = useRef<HTMLInputElement>(null);

  // Speech recognition function

  const startDictation = (ref: React.RefObject<HTMLInputElement>) => {

    const SpeechRecognition = window.SpeechRecognition || (window as any).webkitSpeechRecognition;

    if (!SpeechRecognition) {

      alert("Speech recognition not supported in this browser.");

      return;

    }

    const recognition = new SpeechRecognition();

    recognition.lang = "en-US";

    recognition.interimResults = false;

    recognition.maxAlternatives = 1;

    recognition.onresult = (event: any) => {

      const transcript = event.results[0][0].transcript;

      if (ref.current) {

        ref.current.value = transcript;

        ref.current.dispatchEvent(new Event("input", { bubbles: true }));

      }

    };

    recognition.start();

  };

  const handleSignIn = async (e: React.FormEvent) => {

    e.preventDefault();

    setIsLoading(true);

    const { error } = await signIn(signInData.email, signInData.password);

    if (error) {

      toast({

        title: "Sign in failed",

        description: error.message,

        variant: "destructive",

      });

    } else {

      toast({

        title: "Welcome back!",

        description: "You have been signed in successfully.",

      });

      // Navigate to intended destination or dashboard

      navigate(redirectTo || '/dashboard');

    }

    setIsLoading(false);

  };

  const handleSignUp = async (e: React.FormEvent) => {

    e.preventDefault();

    setIsLoading(true);

    const { error } = await signUp(

      signUpData.email,

      signUpData.password,

      signUpData.role,

      signUpData.firstName,

      signUpData.lastName

    );

    if (error) {

      toast({

        title: "Sign up failed",

        description: error.message,

        variant: "destructive",

      });

    } else {

      toast({

        title: "Account created!",

        description: "Please check your email to confirm your account.",

      });

    }

    setIsLoading(false);

  };

  return (

    <div className="min-h-screen flex items-center justify-center bg-gradient-to-br from- background via-card/20 to-background p-4">

      <Card className="w-full max-w-md">

        <CardHeader className="text-center">

          <CardTitle className="text-2xl font-bold">NeuroBridge</CardTitle>

          <CardDescription>

            Inclusive neurodivergent skills discovery platform

          </CardDescription>

        </CardHeader>

        <CardContent>

          {/\* Navigation Message \*/}

          {navigationMessage && (

            <div className="mb-6 p-4 bg-primary/5 border border-primary/20 rounded-lg">

              <p className="text-sm text-muted-foreground text-center">

                {navigationMessage}

              </p>

            </div>

          )}

          <Tabs defaultValue="signin" className="w-full">

            <TabsList className="grid w-full grid-cols-2">

              <TabsTrigger value="signin">Sign In</TabsTrigger>

              <TabsTrigger value="signup">Sign Up</TabsTrigger>

            </TabsList>

            <TabsContent value="signin">

              <form onSubmit={handleSignIn} className="space-y-4">

                <div className="space-y-2 relative">

                  <Label htmlFor="signin-email">Email</Label>

                  <Input

                    id="signin-email"

                    type="email"

                    placeholder="Enter your email"

                    value={signInData.email}

                    onChange={(e) => setSignInData({ ...signInData, email: e.target.value })}

                    required

                    ref={signInEmailRef}

                  />

                  <button

                    type="button"

                    onClick={() => startDictation(signInEmailRef)}

                    title="Speak"

                    className="absolute right-2 top-9 text-xl cursor-pointer"

                  >

                    🎤

                  </button>

                </div>

                <div className="space-y-2 relative">

                  <Label htmlFor="signin-password">Password</Label>

                  <Input

                    id="signin-password"

                    type="password"

                    placeholder="Enter your password"

                    value={signInData.password}

                    onChange={(e) => setSignInData({ ...signInData, password: e.target.value })}

                    required

                    ref={signInPasswordRef}

                  />

                  <button

                    type="button"

                    onClick={() => startDictation(signInPasswordRef)}

                    title="Speak"

                    className="absolute right-2 top-9 text-xl cursor-pointer"

                  >

                    🎤

                  </button>

                </div>

                <Button type="submit" className="w-full" disabled={isLoading}>

                  {isLoading && <Loader2 className="mr-2 h-4 w-4 animate-spin" />}

                  Sign In

                </Button>

              </form>

            </TabsContent>

            <TabsContent value="signup">

              <form onSubmit={handleSignUp} className="space-y-4">

                <div className="grid grid-cols-2 gap-4">

                  <div className="space-y-2 relative">

                    <Label htmlFor="signup-firstname">First Name</Label>

                    <Input

                      id="signup-firstname"

                      placeholder="First name"

                      value={signUpData.firstName}

                      onChange={(e) => setSignUpData({ ...signUpData, firstName: e.target.value })}

                      ref={signUpFirstNameRef}

                    />

                    <button

                      type="button"

                      onClick={() => startDictation(signUpFirstNameRef)}

                      title="Speak"

                      className="absolute right-2 top-9 text-xl cursor-pointer"

                    >

                      🎤

                    </button>

                  </div>

                  <div className="space-y-2 relative">

                    <Label htmlFor="signup-lastname">Last Name</Label>

                    <Input

                      id="signup-lastname"

                      placeholder="Last name"

                      value={signUpData.lastName}

                      onChange={(e) => setSignUpData({ ...signUpData, lastName: e.target.value })}

                      ref={signUpLastNameRef}

                    />

                    <button

                      type="button"

                      onClick={() => startDictation(signUpLastNameRef)}

                      title="Speak"

                      className="absolute right-2 top-9 text-xl cursor-pointer"

                    >

                      🎤

                    </button>

                  </div>

                </div>

                <div className="space-y-2 relative">

                  <Label htmlFor="signup-email">Email</Label>

                  <Input

                    id="signup-email"

                    type="email"

                    placeholder="Enter your email"

                    value={signUpData.email}

                    onChange={(e) => setSignUpData({ ...signUpData, email: e.target.value })}

                    required

                    ref={signUpEmailRef}

                  />

                  <button

                    type="button"

                    onClick={() => startDictation(signUpEmailRef)}

                    title="Speak"

                    className="absolute right-2 top-9 text-xl cursor-pointer"

                  >

                    🎤

                  </button>

                </div>

                <div className="space-y-2 relative">

                  <Label htmlFor="signup-password">Password</Label>

                  <Input

                    id="signup-password"

                    type="password"

                    placeholder="Create a password"

                    value={signUpData.password}

                    onChange={(e) => setSignUpData({ ...signUpData, password: e.target.value })}

                    required

                    ref={signUpPasswordRef}

                  />

                  <button

                    type="button"

                    onClick={() => startDictation(signUpPasswordRef)}

                    title="Speak"

                    className="absolute right-2 top-9 text-xl cursor-pointer"

                  >

                    🎤

                  </button>

                </div>

                <div className="space-y-2">

                  <Label htmlFor="signup-role">Role</Label>

                  <Select

                    value={signUpData.role}

                    onValueChange={(value: 'manager' | 'candidate') =>

                      setSignUpData({ ...signUpData, role: value })

                    }

                  >

                    <SelectTrigger>

                      <SelectValue placeholder="Select your role" />

                    </SelectTrigger>

                    <SelectContent>

                      <SelectItem value="candidate">Candidate</SelectItem>

                      <SelectItem value="manager">Manager</SelectItem>

                    </SelectContent>

                  </Select>

                </div>

                <Button type="submit" className="w-full" disabled={isLoading}>

                  {isLoading && <Loader2 className="mr-2 h-4 w-4 animate-spin" />}

                  Sign Up

                </Button>

              </form>

            </TabsContent>

          </Tabs>

        </CardContent>

      </Card>

    </div>

  );

};

export default Auth;

**Src/ Pages/Dashboard.tsx**

import React, { useEffect } from 'react';

import { useNavigate } from 'react-router-dom';

import { useAuth } from '@/contexts/AuthContext';

import CandidateDashboard from '@/components/dashboard/CandidateDashboard';

import ManagerDashboard from '@/components/dashboard/ManagerDashboard';

import { Loader2 } from 'lucide-react';

const Dashboard = () => {

  const { user, profile, loading } = useAuth();

  const navigate = useNavigate();

  useEffect(() => {

    if(!loading){

      if(!user) {

        navigate('/auth', {replace:true});

      }

    }

  }, [user, loading, navigate]);

  if(loading){

    return (

      <div className='min-h-screen flex items-center justify-center'>

        <Loader2 className='h-8 w-8 animate-spin'/>

      </div>

    );

  }

  if(!user || !profile){

    return null;  // or you can put a fallback UI

  }

  return (

    <div className='min-h-screen bg-background'>

      {profile.role === 'candidate' ? <CandidateDashboard/> : <ManagerDashboard/>}

    </div>

  );

};

export default Dashboard;

**Src/Style/Accessibilty.css**

/\* Accessibility CSS for dynamic theme changes \*/

/\* High Contrast Mode \*/

.high-contrast {

  --background: 0 0% 0%;

  --foreground: 0 0% 100%;

  --card: 0 0% 10%;

  --card-foreground: 0 0% 100%;

  --popover: 0 0% 10%;

  --popover-foreground: 0 0% 100%;

  --primary: 47.9 95.8% 53.1%;

  --primary-foreground: 0 0% 0%;

  --secondary: 0 0% 20%;

  --secondary-foreground: 0 0% 100%;

  --muted: 0 0% 20%;

  --muted-foreground: 0 0% 85%;

  --accent: 0 0% 20%;

  --accent-foreground: 0 0% 100%;

  --destructive: 0 84.2% 60.2%;

  --destructive-foreground: 0 0% 100%;

  --border: 0 0% 30%;

  --input: 0 0% 20%;

  --ring: 47.9 95.8% 53.1%;

}

/\* Reduced Motion \*/

.reduce-motion \*,

.reduce-motion \*::before,

.reduce-motion \*::after {

  animation-duration: 0.01ms !important;

  animation-iteration-count: 1 !important;

  transition-duration: 0.01ms !important;

  scroll-behavior: auto !important;

}

/\* Theme Variations \*/

[data-theme="warm"] {

  --primary: 24.6 95% 53.1%;

  --primary-foreground: 60 9.1% 97.8%;

  --accent: 36 64.3% 57.8%;

  --accent-foreground: 60 9.1% 97.8%;

}

[data-theme="cool"] {

  --primary: 210 40% 56%;

  --primary-foreground: 210 40% 98%;

  --accent: 180 25% 70%;

  --accent-foreground: 180 25% 15%;

}

[data-theme="monochrome"] {

  --primary: 0 0% 30%;

  --primary-foreground: 0 0% 100%;

  --accent: 0 0% 60%;

  --accent-foreground: 0 0% 100%;

  --card: 0 0% 95%;

  --card-foreground: 0 0% 10%;

}

/\* Font size utilities \*/

html {

  font-size: 16px; /\* Default \*/

}

/\* Ensure accessibility features are applied \*/

.accessibility-applied {

  transition: all 0.3s ease;

}

**Supabase/Migration**

-- Create user roles enum

CREATE TYPE public.user\_role AS ENUM ('manager', 'candidate');

-- Create profiles table

CREATE TABLE public.profiles (

  id UUID NOT NULL DEFAULT gen\_random\_uuid() PRIMARY KEY,

  user\_id UUID NOT NULL REFERENCES auth.users(id) ON DELETE CASCADE,

  role user\_role NOT NULL,

  email TEXT NOT NULL,

  first\_name TEXT,

  last\_name TEXT,

  created\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now(),

  updated\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now(),

  UNIQUE(user\_id)

);

-- Create candidate details table

CREATE TABLE public.candidate\_details (

  id UUID NOT NULL DEFAULT gen\_random\_uuid() PRIMARY KEY,

  user\_id UUID NOT NULL REFERENCES auth.users(id) ON DELETE CASCADE,

  phone TEXT,

  address TEXT,

  skills TEXT[],

  experience\_years INTEGER,

  education TEXT,

  current\_position TEXT,

  linkedin\_profile TEXT,

  github\_profile TEXT,

  bio TEXT,

  accessibility\_preferences JSONB DEFAULT '{}',

  created\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now(),

  updated\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now(),

  UNIQUE(user\_id)

);

-- Create manager remarks table

CREATE TABLE public.manager\_remarks (

  id UUID NOT NULL DEFAULT gen\_random\_uuid() PRIMARY KEY,

  manager\_id UUID NOT NULL REFERENCES auth.users(id) ON DELETE CASCADE,

  candidate\_id UUID NOT NULL REFERENCES auth.users(id) ON DELETE CASCADE,

  remarks TEXT NOT NULL,

  rating INTEGER CHECK (rating >= 1 AND rating <= 5),

  recommendation\_status TEXT DEFAULT 'pending',

  created\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now(),

  updated\_at TIMESTAMP WITH TIME ZONE NOT NULL DEFAULT now()

);

-- Enable RLS

ALTER TABLE public.profiles ENABLE ROW LEVEL SECURITY;

ALTER TABLE public.candidate\_details ENABLE ROW LEVEL SECURITY;

ALTER TABLE public.manager\_remarks ENABLE ROW LEVEL SECURITY;

-- RLS Policies for profiles

CREATE POLICY "Users can view their own profile" ON public.profiles

  FOR SELECT USING (auth.uid() = user\_id);

CREATE POLICY "Users can update their own profile" ON public.profiles

  FOR UPDATE USING (auth.uid() = user\_id);

CREATE POLICY "Users can insert their own profile" ON public.profiles

  FOR INSERT WITH CHECK (auth.uid() = user\_id);

-- RLS Policies for candidate\_details

CREATE POLICY "Candidates can view their own details" ON public.candidate\_details

  FOR SELECT USING (auth.uid() = user\_id);

CREATE POLICY "Candidates can update their own details" ON public.candidate\_details

  FOR UPDATE USING (auth.uid() = user\_id);

CREATE POLICY "Candidates can insert their own details" ON public.candidate\_details

  FOR INSERT WITH CHECK (auth.uid() = user\_id);

CREATE POLICY "Managers can view all candidate details" ON public.candidate\_details

  FOR SELECT USING (

    EXISTS (

      SELECT 1 FROM public.profiles

      WHERE user\_id = auth.uid() AND role = 'manager'

    )

  );

-- RLS Policies for manager\_remarks

CREATE POLICY "Managers can view their own remarks" ON public.manager\_remarks

  FOR SELECT USING (auth.uid() = manager\_id);

CREATE POLICY "Managers can insert remarks" ON public.manager\_remarks

  FOR INSERT WITH CHECK (

    auth.uid() = manager\_id AND

    EXISTS (

      SELECT 1 FROM public.profiles

      WHERE user\_id = auth.uid() AND role = 'manager'

    )

  );

CREATE POLICY "Managers can update their own remarks" ON public.manager\_remarks

  FOR UPDATE USING (auth.uid() = manager\_id);

CREATE POLICY "Candidates can view remarks about them" ON public.manager\_remarks

  FOR SELECT USING (auth.uid() = candidate\_id);

-- Create function to update timestamps

CREATE OR REPLACE FUNCTION public.update\_updated\_at\_column()

RETURNS TRIGGER AS $$

BEGIN

  NEW.updated\_at = now();

  RETURN NEW;

END;

$$ LANGUAGE plpgsql SET search\_path = public;

-- Create triggers for automatic timestamp updates

CREATE TRIGGER update\_profiles\_updated\_at

  BEFORE UPDATE ON public.profiles

  FOR EACH ROW

  EXECUTE FUNCTION public.update\_updated\_at\_column();

CREATE TRIGGER update\_candidate\_details\_updated\_at

  BEFORE UPDATE ON public.candidate\_details

  FOR EACH ROW

  EXECUTE FUNCTION public.update\_updated\_at\_column();

CREATE TRIGGER update\_manager\_remarks\_updated\_at

  BEFORE UPDATE ON public.manager\_remarks

  FOR EACH ROW

  EXECUTE FUNCTION public.update\_updated\_at\_column();

-- Create function to handle new user profiles

CREATE OR REPLACE FUNCTION public.handle\_new\_user()

RETURNS TRIGGER AS $$

BEGIN

  INSERT INTO public.profiles (user\_id, email, role, first\_name, last\_name)

  VALUES (

    NEW.id,

    NEW.email,

    COALESCE(NEW.raw\_user\_meta\_data ->> 'role', 'candidate')::user\_role,

    NEW.raw\_user\_meta\_data ->> 'first\_name',

    NEW.raw\_user\_meta\_data ->> 'last\_name'

  );

  RETURN NEW;

END;

$$ LANGUAGE plpgsql SECURITY DEFINER SET search\_path = public;

-- Create trigger for new user profile creation

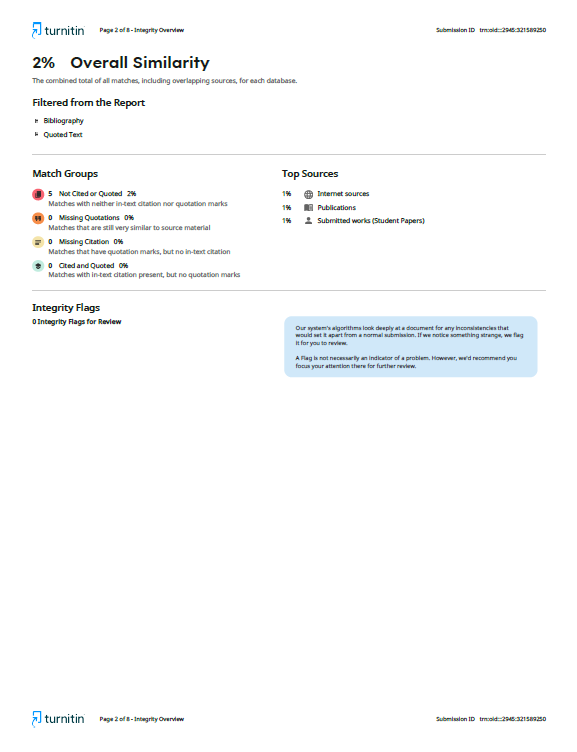
CREATE TRIGGER on\_auth\_user\_created

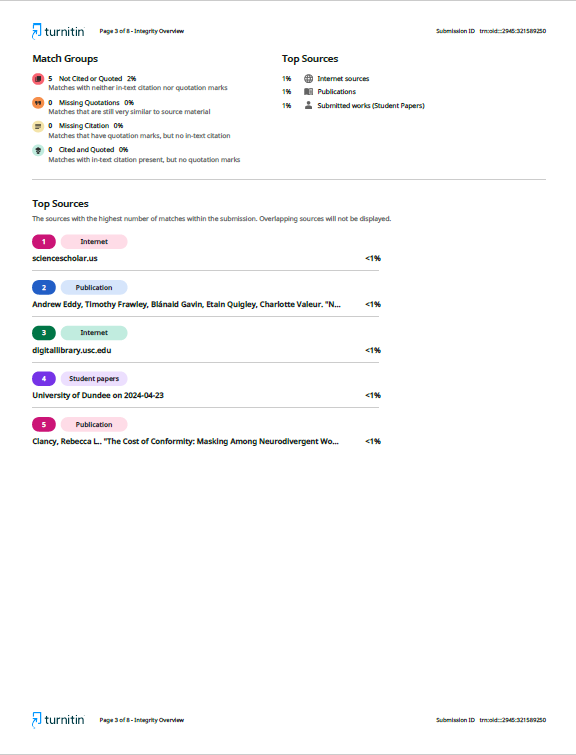
  AFTER INSERT ON auth.users

  FOR EACH ROW EXECUTE FUNCTION public.handle\_new\_user();

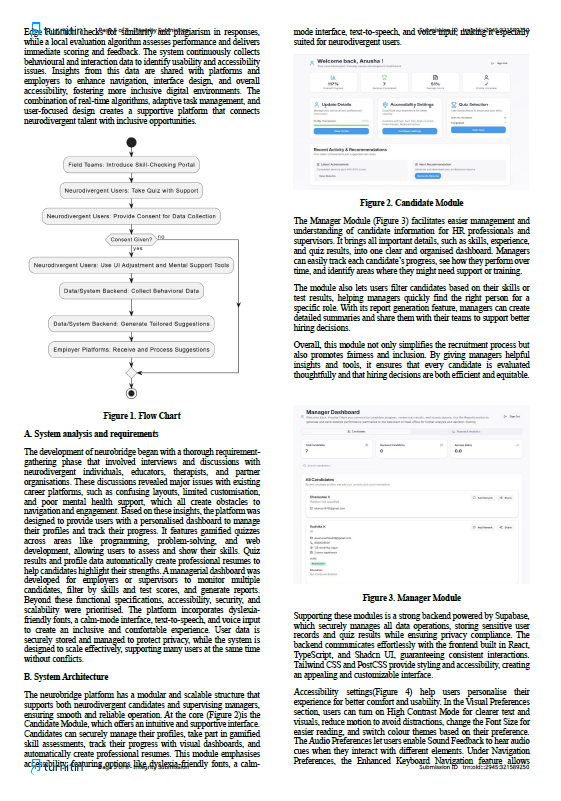
**GITHUB URL LINK :** https://github.com/DHANUSREEV/NeuroBridge-Project-.git

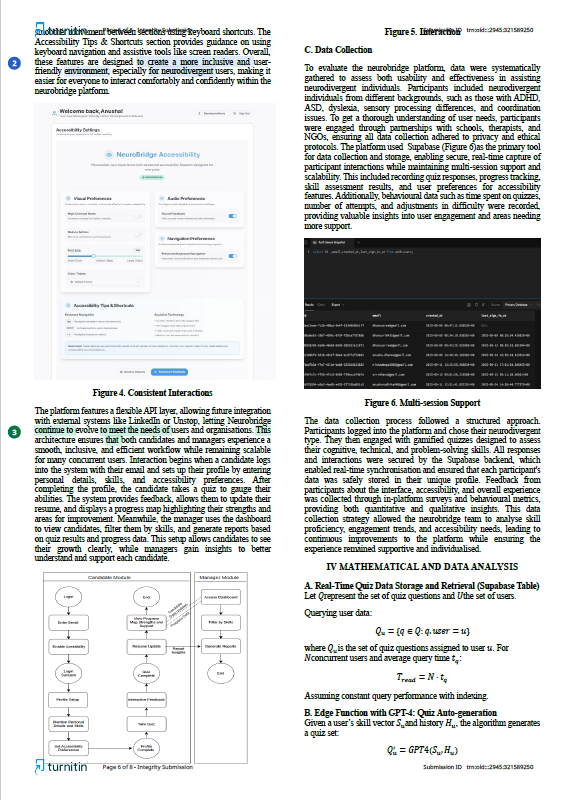
**A4. PLAGIARISM REPORT :**

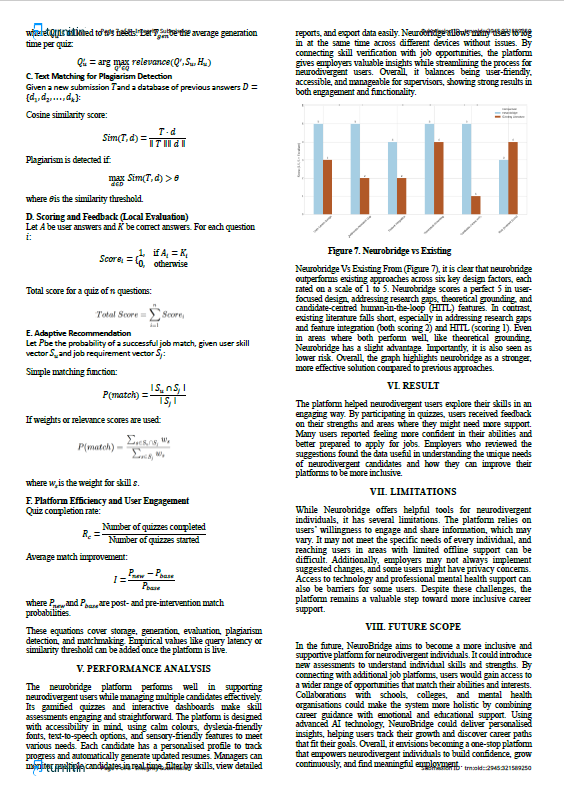
**  
**

****

****

****

****

****

****

**A5. REFERENCES**

[[1] Tomczak, M. T., & Ziemiański, P. (2023). Autistic employees’ technology-based workplace accommodation preferences survey—Preliminary findings. *International Journal of Environmental Research and Public Health, 20*(10), 5773. <https://www.mdpi.com/1660-4601/20/10/5773>

[2] Menezes, N. da S., da Rocha, T. Á., Camelo, L. S. S., & Mota, M. P. (2025). “I felt pressured to give 100% all the time”: How are neurodivergent professionals being included in software development teams? In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (Vol. 73, pp. 1–11). ACM. <https://dl.acm.org/doi/10.1145/3613904.3642197>

[3] Hall, K., Arora, P., Lowy, R., Kim, J. G., Mcdonald, K. M., & Mankoff, J. (2024). Designing for strengths: Opportunities to support neurodiversity in the workplace. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (Vol. 73, pp. 1–11). ACM. <https://dl.acm.org/doi/10.1145/3613904.3642424>

[4] Heggo, I., & Abdelbaki, N. (2018). Hybrid information filtering engine for personalized job recommender system. In *Advances in Intelligent Systems and Computing* (Vol. 746, pp. 553–563). Springer. <https://link.springer.com/chapter/10.1007/978-3-319-74690-6_54>

[5] Hong, S. R., Zampieri, M., Hand, B. N., Motti, V., Chung, D., & Uzuner, O. (2024). Collaborative design for job-seekers with autism: A conceptual framework for future research. *arXiv*. <https://arxiv.org/abs/2405.06078>

[6] Harris, C. G. (2018). Making better job hiring decisions using “human in the loop” techniques. In *Proceedings of the 2nd International Workshop on Augmenting Intelligence with Humans-in-the-Loop co-located with 17th International Semantic Web Conference (ISWC 2018)* (Vol. 2169, pp. 16–26). CEUR-WS. <https://ceur-ws.org/Vol-2169/paper-03.pdf>

[7] Ara, Z., Ganguly, A., Peppard, D., & Hong, S. R. (2024). Collaborative job seeking for people with autism: Challenges and design opportunities. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (Vol. 73, p. 73). ACM. <https://dl.acm.org/doi/10.1145/3613904.3642197>

[8] Saleh, J., et al. (2025). Neurodivergence and the workplace: A systematic review of the literature. *Journal of Vocational Behavior, 145*, 104666. <https://journals.sagepub.com/doi/10.1177/10522263251337564>

[9] Nair, V. S. (2025). Mapping the lacunae between neurodivergent individuals and work organizations. *Human Resource Management Review, 35*, 100857. <https://www.sciencedirect.com/science/article/pii/S0001691825004469>

[10] Johnson, S. P., et al. (2023). Understanding the experience of neurodivergent workers in image and text data annotation. *Data Science Journal, 22*, 1–14. <https://datascience.codata.org/articles/10.5334/dsj-2023-040>

[11] Memarian, B., et al. (2024). Human-in-the-loop in artificial intelligence in education: A review and entity-relationship analysis. *Computers and Education, 168*, 104201. <https://www.sciencedirect.com/science/article/pii/S2949882124000136>

[12] Kapp, E. E., Byers, S. M., Lawson, L. L., & Ougrin, C. F. (2023). Exploring neurodiversity in the workplace: Perspectives on inclusion, accommodations, and employment outcomes. *Journal of Vocational Rehabilitation, 58*, 73–89. <https://journals.sagepub.com/doi/full/10.1177/10464964231213564>

[13] van Rijswijk, J., Curșeu, P. L., & van Oortmerssen, L. A. (2024). *Cognitive and neurodiversity in groups: A systemic and integrative review.* *Small Group Research, 55*(1), 44–88. <https://journals.sagepub.com/doi/pdf/10.1177/10464964231213564>

[14] Davies, J., et al. (2024). *Career progression for autistic people: A scoping review.* *Autism in Adulthood, 6*(1), 3–14. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11494842/pdf/10.1177_13623613241236110.pdf>

[15] Weber, C., Krieger, B., Häne, E., Yarker, J., & McDowall, A. (2024). *Physical workplace adjustments to support neurodivergent workers: A systematic review.* *Applied Psychology: An International Review, 73*(1), 154–192. <https://iaap-journals.onlinelibrary.wiley.com/doi/epdf/10.1111/apps.12431>

[16] Zhou, K., Alam, B., Fatemi, A. B., Howe, A., Chattu, V. K., & Nowrouzi Kia, B. (2023). *Autism spectrum disorder in the workplace: A position paper to support an inclusive and neurodivergent approach to work participation and engagement.* *Archives of Public Health, 81*(1), 199. <https://link.springer.com/article/10.1007/s44202-024-00150-5>

[17] Iannone, A., & Giansanti, D. (2023). *Breaking barriers—The intersection of AI and assistive technology in autism care: A narrative review.* *Journal of Personalized Medicine, 14*(1), 41. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10817661/>

[18] Griffiths, A. J., Torres, R., Delgado, R., Hurley-Hanson, A. E., Giannantonio, C. M., Walrod, W., Maupin, Z., & Brady, J. (2024). *Understanding unique employability skill sets of autistic individuals: A systematic review.* *Journal of Employment Counseling, 61*(4), 320–350. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/joec.12223>

[19] Shen, Z., & Yu, C.-L. (2025). *How technology advances research and practice in autism spectrum disorder: A narrative review on early detection, subtype stratification, and intervention.* *Brain Sciences, 15*(8), 890. <https://pmc.ncbi.nlm.nih.gov/articles/PMC12384708/>

[20] Guastella, A. J., Hankin, L., Stratton, E., Glozier, N., Pellicano, E., & Gibbs, V. (2025). *Improving accessibility for work opportunities for adults with autism in an end-to-end supported workplace program: Protocol for a mixed methods cohort study.* *JMIR Research Protocols, 14*, e60806. <https://pmc.ncbi.nlm.nih.gov/articles/PMC12082053/>

[21] Zhou, K., Richard, C., Zhai, Y., Li, D., & Fry, H. (2025). *Employment-related assistive technology needs in autistic adults: A mixed-methods study.* *European Journal of Investigation in Health, Psychology and Education, 15*(9), 170. <https://www.mdpi.com/2254-9625/15/9/170>

[22] Wall, J. (2025). *Disability technology.* *The Royal Society Report* (June 25, 2025). <https://www.techuk.org/resource/inclusive-innovation-unlocking-the-potential-of-tech-for-accessibility.html>

[23] Halpi, M. (2024). *How assistive technology works for people with autism.* *Recite Me.* <https://reciteme.com/news/assistive-technology-for-autism/>

[24] Frank, H. E., Kagan, E. R., Storch, E. A., Wood, J. J., Kerns, C., Lewin, A. B., Small, B. J., & Kendall, P. C. (2020). *Accommodation of anxiety in youth with autism spectrum disorder: Results from the TAASD study.* *Journal of Clinical Child & Adolescent Psychology, 51*(2), 219–229. <https://pmc.ncbi.nlm.nih.gov/articles/PMC7722072/>

[25] Katirai, A. (2025). *Autism and emotion recognition technologies in the workplace.* *Autism, 29*(3), 554–565. <https://pubmed.ncbi.nlm.nih.gov/39282995/>

[26] Bae, S., Hong, J., Ha, S., Moon, J., Yu,Lee, D., Yoo, H., Lee, Y., Son, J.-W., & Cheon, K.-A. (2025). *Multimodal AI for risk stratification in autism spectrum disorder: integrating voice and screening tools.* *npj Digital Medicine, 8*, 538. <https://www.nature.com/articles/s41746-025-01914-6>

[27] Walsh, E., Holloway, J., McCoy, A., & Lydon, H. (2017). Technology-aided interventions for employment skills in adults with autism spectrum disorder: A systematic review. *Review Journal of Autism and Developmental Disorders*, 4, 12–25. [https://link.springer.com/article/10.1007/s40489-016-0093-x](https://link.springer.com/article/10.1007/s40489-016-0093-x?utm_source=chatgpt.com)