

**EduCare: AI Tutor and Health Assistant for Autism Support**

**FINAL YEAR PROJECT PHASE-I**

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Mention Date here

**FINAL YEAR PROJECT PHASE-I DOCUMENTATION**

**STATEMENT OF SUBMISSION**

This is to certify that Saira Arshad Roll No. 70126012, Haseeb Tariq Roll No. 70109359 and Maheen Qamar Roll No. 70126610 have successfully submitted to the University of Lahore in partial fulfillment of the requirement for the award of degree of Bachelors of Science in Software Engineering (BSSE)

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ABSTRACT

This AI-driven platform offers holistic support for children with Autism Spectrum Disorder (ASD) and their caregivers. By initiating with a personalized assessment to determine the child’s developmental stage and ASD level, the app customizes its features to suit individual needs. It incorporates an AI-powered chatbot to guide parents on autism-related concerns and enhance their decision-making. For children, the app provides an AI tutor delivering tailored learning modules, interactive games, and activities to foster cognitive, social, and behavioral growth. Additionally, the platform includes a progress-tracking system, offering caregivers detailed insights into developmental milestones and achievements. With its user-friendly design and integration of learning, parental guidance, and progress monitoring, the app empowers families to navigate ASD challenges with comprehensive and meaningful support.

**DEDICATION**

With hearts full of gratitude and compassion, we dedicate this project to our Almighty God, whose guidance and blessings have illuminated every step of this journey.

To our beloved parents, who have been our unwavering pillars of strength, and to our mentors, whose wisdom and encouragement have shaped our vision—your faith in us has been our greatest inspiration.

This work is also a tribute to the courageous children living with Autism Spectrum Disorder and their extraordinary parents, whose resilience and love transcend all challenges. It is our hope that this platform serves as a beacon of support, empowerment, and understanding for all who walk this path.

May this endeavor bring comfort, growth, and hope to the lives it touches.

Acknowledgement

First and foremost, we are incredibly appreciative of **Allah Almighty**, whose unending blessings and direction have made it possible for us to start and finish this endeavor. None of this would have been possible if it weren't for His kindness and mercy.  
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Lastly, we are immensely thankful to all our team members for their hard work, collaboration, and commitment. It is through our collective efforts and shared determination that this project has come to fruition.

To everyone who contributed to this endeavor, directly or indirectly, we are forever grateful.

**Haseeb Tariq**

**Saira Arshad**

**Maheen Qamar**

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# **Chapter 01: Introduction to the Problem**

# **Introduction:**

Our app is a comprehensive, AI-driven platform designed to support children with Autism Spectrum Disorder (ASD) and their caregivers. It begins with an **initial assessment** to evaluate the child’s ASD level and developmental stage, ensuring a fully personalized experience tailored to their unique needs. The app features an **AI-powered chatbot** that provides parents with expert guidance on autism-related concerns, enhancing their understanding and decision-making.

For children, the app offers an **AI tutor** delivering personalized learning modules, interactive games, and activities that promote cognitive, social, and behavioral development. Parents and caregivers can leverage the **progress tracking system** to monitor their child’s achievements and developmental milestones through detailed, data-driven insights.

With its **intuitive design and accessibility**, the app seamlessly integrates learning, parental guidance, and progress monitoring into a single, cohesive platform. This innovative tool empowers families by addressing both educational and caregiving needs, providing meaningful support for children with autism and their loved ones.

# **Purpose**:

The purpose of this app is to create a comprehensive, technology-driven solution that supports children with Autism Spectrum Disorder (ASD) and their caregivers in meaningful ways. By offering personalized learning experiences through AI-driven activities and educational modules, the app aims to enhance the cognitive, social, and behavioral development of children with autism. It also provides caregivers with reliable resources, including an AI-powered chatbot for expert guidance and decision-making support, making it easier to navigate the challenges of autism care. Additionally, the app simplifies progress monitoring by delivering data-driven insights that help families and educators track and evaluate the child’s growth and achievements over time. By addressing the fragmentation found in existing solutions, the app integrates learning, guidance, and progress tracking into a user-friendly and cohesive platform, ultimately improving the quality of life for both children with autism and their families.

# **Objective:**

**Add an Initial Assessment Feature:** Implement an assessment at the start of the app to evaluate the child’s ASD level (e.g., mild, moderate, severe) and age group. This assessment will help personalize the app experience, suggesting activities, games, and educational modules that best match the child’s abilities and developmental needs.

**Develop an AI-Powered Chatbot:** Create a chatbot that provides parents with reliable answers to general autism-related questions, including behavioral concerns and guidance to enhance parental understanding and decision-making.

**Implement an AI Tutor for Learning and Activities:** Design an AI-driven tutor that offers children with autism personalized learning modules, interactive games, and activities aimed at improving cognitive skills, engagement, and social development.

**Enable Progress Tracking and Monitoring:** Develop a progress tracking feature that allows parents and caregivers to monitor their child’s development, learning achievements, and activity progress, providing data-driven insights for informed decision-making. The progress tracker will generate report, allowing parents and educators to assess improvements in learning, attention, and interaction over time.

**Enhance User Experience and Accessibility:** Ensure the app is easy to navigate, user-friendly, and accessible for both children with autism and their parents, with intuitive interfaces and clear guidance.

**Integrate a Comprehensive Support System:** Combine learning, parental guidance, and progress monitoring into one cohesive platform, offering a well-rounded tool that addresses both the educational and care needs of children with autism and their families. These objectives aim to deliver a comprehensive autism support app that enhances learning, simplifies parental guidance, and tracks child development in a meaningful and accessible way.

# **Existing Solution:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Feature** | **Cognoa** | **Prologue2Go** | **Autism iHelp** | **AutiSpark** | **Inner Voice** | **Otsimo** | **Proposed Solution** |
| **Target Audience** | Parents and clinicians working with children suspected of autism | Nonverbal children, including those with autism | Children with autism, educators and caregivers | Children on the autism spectrum | Children with autism, particularly nonverbal or minimally verbal | Children with autism, educators and caregivers | Children with autism and their caregivers, including parents and educators |
| **Key Features** | AI-powered diagnostic tool, personalized activities, developmental insights | AAC tool for nonverbal individuals, customizable interface, progress tracking | Early intervention educational app, visual learning (flashcards, interactive tasks), progress tracking | Interactive learning activities (sorting, matching, memory games), progress reports | Communication aid using pictures and symbols, generates spoken words | Educational games for language and social skills, progress tracking | Initial assessment, AI-driven learning, chatbot for parental guidance, progress tracking, integrated support system |
| **Communication Support** | ❌ | ✅ | ❌ | ❌ | ✅ | ❌ | ✅ |
| **Educational Activities** | ✅ | ❌ | ✅ | ✅ | ❌ | ✅ | ✅ |
| **Progress Tracking** | ✅ | ✅ | ✅ | ✅ | ❌ | ✅ | ✅ |
| **Parental Support (Chatbot)** | ❌ | ❌ | ❌ | ❌ | ❌ | ❌ | ✅ |
| **Therapeutic Guidance** | ❌ | ❌ | ❌ | ❌ | ❌ | ❌ | ✅ |
| **AI-Driven Personalization** | ✅ | ❌ | ❌ | ❌ | ❌ | ❌ | ✅ |
| **Integrated System** | ❌ | ❌ | ❌ | ❌ | ❌ | ❌ | ✅ |
| **Pricing** | Paid (may be insurance-covered) | Paid (one-time purchase) | Free with in-app purchases | Paid (one-time or subscription) | Paid with optional customization | Freemium with subscription | Freemium with optional premium features |

# **Gap Analysis and Proposed Solution:**

**Problem with Existing Systems**

1. **Fragmentation**: No single platform addresses communication, education, parental guidance, and therapeutic needs together.
2. **Limited Parent Involvement**: Existing systems do not adequately equip parents with tools to monitor and guide their child’s progress.
3. **Absence of Integration**: Parents often must rely on multiple tools, leading to inefficiencies and incomplete support.
4. **Underutilized AI Potential**: Current systems fail to harness AI to provide personalized and adaptive learning or behavior management.

**Addressing the Gaps**

The proposed app is designed as a comprehensive and user-centric solution for children with Autism Spectrum Disorder (ASD) and their caregivers. It begins with an initial assessment feature that evaluates the child’s ASD level and developmental stage, enabling the app to personalize the experience by recommending suitable activities, games, and educational modules aligned with the child’s unique needs.

An AI-powered tutor forms the core of the app’s learning functionality, offering interactive modules and activities to enhance cognitive skills, promote social development, and maintain engagement. This feature is complemented by an AI-powered chatbot that provides caregivers with expert advice on autism-related concerns, including behavioral guidance and strategies to improve decision-making and care.

The app includes a progress tracking system that allows parents and caregivers to monitor their child’s developmental milestones, learning achievements, and activity performance. This feature generates detailed reports, equipping families and educators with data-driven insights to evaluate the child’s growth and make informed interventions.

Designed with accessibility in mind, the app ensures a seamless user experience with intuitive navigation and a child-friendly interface. Its integrated support system combines learning, parental guidance, and progress monitoring into a single cohesive platform, providing a holistic tool that addresses both educational and caregiving needs. This solution empowers families by simplifying autism care and fostering the child’s overall development in a personalized, meaningful way.

# **Chapter 02: Software Requirement Specification**

# **Introduction**

This Software Requirements Specification (SRS) document serves as a foundational guideline for the development team and stakeholders involved in the creation of our AI-driven platform supporting children with Autism Spectrum Disorder (ASD) and their caregivers.

## **Purpose**

The purpose of this document is to provide a clear, detailed, and structured overview of the system’s requirements, ensuring alignment between stakeholders and the development team. It establishes a shared understanding of the project’s scope, objectives, and deliverables, acting as a bridge between conceptualization and implementation. This document will outline the functional, non-functional, and technical requirements essential for developing a system that meets the highest standards of usability, accessibility, and performance.

By adhering to this SRS, the development team will ensure the successful realization of a solution that aligns with stakeholder expectations while delivering meaningful and impactful support to its users.

## **Scope**

The software product, **EduCare: AI Learning and Tutoring Assistant for Autism Support**, is a comprehensive platform designed to assist children with Autism Spectrum Disorder (ASD) and their caregivers. This AI-driven application integrates advanced technologies to deliver personalized learning experiences, caregiver guidance, and developmental progress monitoring within a single, cohesive system.

**EduCare will do:**

* **Personalized Support:** Provide tailored learning modules and interactive activities to support the cognitive, social, and behavioral development of children with ASD.
* **Caregiver Assistance:** Offer AI-powered guidance to caregivers through an intuitive chatbot for addressing autism-related queries and enhancing decision-making.
* **Progress Tracking:** Enable caregivers to monitor the developmental milestones and achievements of children through detailed analytics and reports.

**EduCare will not do:**

* The application does not serve as a replacement for professional medical advice, diagnosis, or therapy.
* It does not provide real-time clinical intervention or therapeutic services.

**Application and Benefits:**  
EduCare is intended to be a valuable tool for families and caregivers, designed to:

* Improve the learning and developmental outcomes for children with ASD through engaging and personalized approaches.
* Empower caregivers with knowledge and resources to better support their child’s growth and well-being.
* Provide an accessible, user-friendly interface to simplify the caregiving and educational journey for families.

## **Definitions, acronyms and abbreviations**

** Definitions:**

* **Autism Spectrum Disorder (ASD):** A developmental condition characterized by challenges with social interaction, communication, and repetitive behaviors, varying in severity across individuals.
* **AI Tutor:** An artificial intelligence system designed to deliver personalized educational content and activities tailored to a child’s developmental needs.
* **Caregiver:** A parent, guardian, or individual responsible for the care and support of a child with ASD.
* **Personalized Learning:** An educational approach tailored to meet the unique abilities, interests, and developmental needs of an individual learner.
* **Progress Tracking:** The systematic monitoring and reporting of a child’s developmental milestones and achievements over time.

** Acronyms:**

* **ASD:** Autism Spectrum Disorder
* **AI:** Artificial Intelligence
* **UI:** User Interface
* **UX:** User Experience
* **SRS:** Software Requirements Specification
* **API:** Application Programming Interface
* **DBMS:** Database Management System

** Abbreviations:**

* **EduCare:** AI-powered Learning and Tutoring Assistant for Autism Support (Project Name)
* **ML:** Machine Learning
* **DL:** Deep Learning
* **NLP:** Natural Language Processing

# Overall Description