

PROJECT PROPOSAL

FOR

**DESIGN AND IMPLEMENTATION OF DEVELOPMENTAL
THERAPY TRACKER FOR AUTISTIC CHILDREN**

PROPOSED BY

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1.1 Background to the study

Autism spectrum disorder (ASD) is a developmental disorder that affects communication and behavior and although autism can be diagnosed at any age, it is described as a “developmental disorder” because symptoms generally appear in the first two years of life (NIMH 2018). Autism is called a spectrum disorder because there are very wide variations in how it affects different people e.g. some ASD patients are non-verbal. There are several signs and symptoms of ASD which include problems with social interaction, communication and exhibiting repetitive/restrictive behaviors.

ASD is best managed when diagnosed early enough and it can be reliably diagnosed usually at the age of two. After diagnosis, treatment efforts generally include:

- **Medications:** Some patients with ASD may be placed on certain medications to help manage problems with irritability, aggression, hyperactivity, attention problems amongst others.
- **Therapy:** This usually includes educational and behavioral therapy. These trainings are usually well structured and intensive to help the patients develop self-care skills, reducing challenging behaviors, learn how to communicate and interact with other people and their environment, all in all, be able to live a relatively independent life.

Both treatments generally require the involvement of parents, siblings and family relations of patients with ASD.

Issues like late diagnosis and inconsistent administration of needed medications and therapy can severely hinder the developmental progress of ASD patients. ASD patients need intensive consistency with their training programs in order to achieve any form of results. Therapists usually outline developmental milestones to be achieved, actions and activities to carry out, behaviors to be monitored amongst several others. However, findings from parents and guardians of children living with ASD at the Child and Adolescent Clinic of the

Neuropsychiatric Hospital, Aro, Abeokuta, showed that instructions and trainings administered by therapists aren't always continued and administered to the patient by the guardian, caretaker or family relations taking care of the patient. Therapists usually have 2-4 sessions with a duration of 30 minutes to 2 hours each session. Most often, all activities carried out by the therapist are not always properly documented and subsequently administered to the patient by the guardian/caretaker. This greatly affects the progress of the patient and may result in little to no progress and lifelong complications. This creates a need to develop a system that provides a communication platform for therapists and guardians/caretakers of ASD patients, allows proper documentation of observations and concerns of guardians/caretakers as well as effectively manages the proper documentation of therapists' trainings.

This project is aimed at developing a therapy tracker for patients with ASD, focused on children below the age of 18, as this is the best period range to positively impact training on the patients.

1.2 Scope of Study

Autism Spectrum Disorder has a very wide range of variations, hence the study is better effective when it is properly streamlined to address a section of the spectrum. This study will be focused on:

1. Patients with ASD under the age of 18.
2. Patients living in Nigeria.
3. Non-verbal patients (Patients with no speech ability).
4. Documentation and tracking of successfully and unsuccessfully achieved milestones.

1.3 Proposed Contribution to Knowledge

Implementing this project will provide a life-saving solution to parents and guardians of children living with ASD in Nigeria to better manage and care for their children. It will help improve the communication between the patient's therapists and family relations, thus ensuring all developments and progress of the patients are well monitored and tracked. It also creates an avenue for guardians and caretakers to properly document daily observations and concerns about the patient.

1.3 Aim and Objectives of Study

The aim of this project is to design and implement a therapy tracker that is used for managing and monitoring the developmental progress of autistic children for therapists and guardians/caretakers of the children.

1.3.1 Objectives of the study

The objectives of this project is to achieve the following;

1. To carry out extensive literature review of existing works on therapy management platforms for autistic patients,
2. To design a model of the proposed platform.
3. To implement the design in (2).
4. To test the performance of the implemented system.

1.4 Literature Review

Table 1: Literature Works

S/N	TITLE	AUTHOR(S) AND YEAR	PROBLEMS	COMMENTS/REMARKS
1.	A detailed breakdown of an autism therapy tracking platform, ChartedMind.	Adrian Grigore.	Applied Behavioral Analysis (ABA) therapists have to documents observations, responses to training and activities to be carried out with the child by hand.	Although a funding campaign, this article provided a detailed insight on a proposed therapy tracking platform for ABA, background studies done, a full breakdown of the app's features and the problems being solved.
2.	7 Apps for Applied Behavior Analysis Therapy.	Saint Joseph's University Special Education Resources.	Looking for means to collect and analyze data on the improvements of the patient.	The article highlights how Applied Behavioral Analysis therapy can be used for development and seven apps that help therapists/teachers and caregivers understand and care for the patient.

3.	Which Behavior Therapy Works Best for Children with Autism?	Christine O'rourke-Lang, Mark Bertin, M.D.	There are several types of behavioral therapies and selecting the best for a child can be challenging.	This article highlights the different kinds of behavioral therapy for autism, what each entails, how it works and the end goals of the therapy.
4.	Recommended Apps by the Autism Program at Boston Medical Center	Boston Medical Center	Proper monitoring and caring for children living with ASD can be very challenging, the center shares resource on technologies that can help reduce the challenges.	This article contains several helpful apps that aid monitoring and caring for children with ASD. It is divided into 5 different categories and what the apps in these categories do. Categories include behavior tracking, emotion regulation as well as others.
5.	Therapies for Autism Spectrum Disorder	Renee A. Alli, MD. November 2018.	Children living with ASD require several therapies to develop their learning, communication and social skills.	The articles give details on the different kinds of therapy that can help improve an ASD patient's skills. Applied Behavioral Analysis is the most common and very expensive. Other kinds also have their strengths and purposes.

1.4 Methodology

- i. Available literature will be studied to understand how the platform will be implemented.
- ii. The User Interface will be designed using HTML, CSS3 and other tools that could facilitate an easy and more appealing design, the front-end development will be done using the JavaScript language and a client-side framework, vue.js while the backend development could be implemented with Firebase or a custom server set up.
- iii. The system will be tested by signing up a therapist and other parties involved in the platform

1.5 References

U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Mental Health (2018). Autism Spectrum Disorder (NIH Publication No. QF 18-5511). Retrieved from <https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml>