

VHAB - Assistive Ecosystem for a Special Need

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Virtual Habilitation, otherwise known as VHAB, is an end-to-end technology-driven application that exploits the world of serious gaming to create an immersive experience for children to improve their locomotive functioning. It is a low-cost solution built on gesture, leap motion and virtual reality platforms that builds a personalized suite of exercises for various kinds of movements for hands, legs, palms and multiple limbs that are fun, interactive as well as ensure development. VHAB is an integration between the reality domain and web application.



Impact of the Innovation

ability to carry out
routine motor activities

eliminates external
equipment & infrastructure

virtual reality stimulates
different environments



The Context



One in every 10 children across the globe experience difficulties in movements that are normally caused by conditions like Autism, MR and Cerebral Palsy. Children with these disabilities tend to have an abnormal development of movement and balance control owing to related neurological conditions.



As of today, these children undergo physiotherapy and orthopaedic massages, which typically increases exertion and fatigue in the long run. This could have a negative influence on their confidence and quality of life.



The Innovation

The project has been developed from 3 perspectives - a desktop application (gesture and leap motion based), a web application and an android application for VR. Gesture reality empowers children to obtain a live feed of their actions through virtual avatars on the screen. The child or the facilitator can view the scores and progress at each level. An analytics window is also provided to draw out the improvements, which in time, can be used for predictive analytics that could help stakeholders to implement proactive measures for the overall development of the child. The exercises have been created in various virtual environments like beaches, parks and gardens to eliminate the mental boundaries of an enclosed space. In the successive phases of the application, an integration with brain computer interface systems has also been planned. This will enable their doctors to understand and analyze the effects that the technology-driven application has on the overall development of the child.



Overcoming Challenges

Challenge #1

The application had to cater to each child's specific challenges, the empathetic perspective of the users and their individual restrictions. So, the team had to undergo a design-thinking activity to relate to the emotional aspects and get the right problem statement, user case and limitations of each disability.

Challenge #2

Sampling from a population of such children (whose emotional balances are different; sometimes leading to mood fluctuations and variance in interest towards doing activities or trials). The team ensured a PDCA cycle and dynamic changes to the application to suit their needs.