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Evolution and Growth of Assistive Technology for Well Being of Individuals with Special Needs

DR. ABINAYA S.M.¹

ABSTRACT

Assistive technology is an equipment or a device which enhances the living standard of people with special needs. The evolution and growth of technology had led to the formation of Assistive technology. There are different kinds of assistive technology such as Braille, Prosthetics, Screen Readers, Wheel Chair, Power Lifts etc., which are suitably created for different Levels and kinds of Disabilities. Assistive technology has created a great impact on the life of people with special needs, thus enhancing their lifestyle and promoting independence. Several International, National and State Treaties, Conventions, Laws and policies have made a revolutionary change towards the implementation of Assistive Technology worldwide, leading to the empowerment of People with Special needs. This Research paper confers a detailed study on the Evolution, Importance and Impact of Assistive Technology in the Life of People with Special Needs and the shortcomings faced by them in attaining and using assistive technology. The Researcher used a Qualitative form of Methodology to enhance the reader's insight into the findings of the true nature and impact of Assistive Technology in our today's Society.

Keywords: Assistive Technology, People with Special Needs, Technology, Empowerment, Disability, Life Style.

I. INTRODUCTION

The term Assistive Technology in Medical Science signifies “*an equipment which is designed to aid, help or assist a person with disability to perform his daily task, activity or work independently without the dependence or intervention of others in their day today life.*”² There are various kinds of assistive technology formulated for different levels of disability. These Assistive technologies possess a tremendous importance and plays a predominant role in the life of the differently abled people by assisting them in hearing, learning, speaking, seeing, walking, reading, typing, remembering etc.³ Depending on the level and nature of the disability,

¹ Author is an Advocate in India.

² World Health Organisation, “Definition of AT from Medical Science”

³ Assistive Technology Industry Solution, “What Is AT”, What is AT? - Assistive Technology Industry Association (atia.org)

the assistive technology equipment differs from one person to another. The most common examples of the assistive technology are as follows: Braille, Prosthetics, Screen readers, Wheel chair, Power lifts, Walkers, Hearing Aid, Spectacles, Special computers & keyboard, Screen magnifier etc. For the better understanding of the Assistive technology and its impact on the life of the people with special needs, one must clearly understand the true nature and objective behind the formulation of such technology.

The History of Assistive technology could be traced back to 300 BC and its potential development portrays us the advancement that was possessed by the humans who existed before the common era. The subsequent growth of the technology had intensified the advancement, development and improvement of various kinds of Assistive technology globally. Whereas the main aim and objective of the Assistive Technology is to enhance and uplift the life of people with disability.

As per the World Health Organisation “*Around 15% of the world’s population or estimated 1 billion people live with disabilities. They are the World’s largest Minority*”. Whereas 80% of People with disability are found in the Developing country.⁴ There are 4 main types of disability such as: Behavioural or Emotional disability, Sensory Impaired disability, Physical disability and Developmental Disability.⁵

- **Behavioural or Emotional Disability** includes Anxiety disorders, Dissociative disorders, Disruptive or Impulsive behaviours, and Pervasive development disorders
- **Sensory Impaired Disability** includes Hearing impairment, Vision Impairment, Speech Impairment, Smell and Touch impairment.
- **Physical disability** includes Mobility impairment.
- **Developmental Disability** includes Attention deficit hyperactivity disorder (ADHD), Cerebral palsy, Autistic spectrum disorder (ASD), Intellectual disability, Learning disabilities.

Whereas only 10 in 100 disabled people have attained the privilege of enjoying the assistive technology however the remaining people are dependent on others for carrying out their day today basic needs. This research aims in addressing the Evolution, Growth, Impact, Awareness and Implementation of Assistive Technology in India for better understanding of the Disability and the improvement of the differently abled people’s lifestyle through Assistive Technology.

⁴ World Health Organisation

⁵ Evie Lee, CPD Online College, “What are the different types of disabilities”, Different types of disabilities | behavioural, emotional and sensory (cpdonline.co.uk), Last updated on 27.05.2022

II. EVOLUTION AND GROWTH OF ASSISTIVE TECHNOLOGY IN INDIA

The Term “Assistive Technology” is defined as “any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” as per *The Assistive Technology Act 2004 (United States)*.⁶

The History of Assistive technology could be traced back to 1500 BC, where the Great Indian Legacy, Rig Veda contains 1st written record of prosthetic used by Queen Vishpla for replacing her lost limb in the war⁷ and it further dates back to 950 BC, where the oldest prosthetics, *the Cairo Toe* - an artificial toe was found by the scientist on a mummy in Egyptian tomb at Luxor. Further it is rigidly believed by the scientist that the time line of the formation and use of the Assistive Technology could even trace back to 300 BC.⁸

Multiple discoveries have been made by several prominent scientist on the usage of Prosthetics during the early 16th Century. Whereas artificial limbs were one of the most popular Assistive technologies evolved to restore the lost limbs of the Kings during the war. Further the inclination of World War I and II, which resulted in amputation of the Limbs of several fighters, were restored by the usage of Prosthetics. Apart from Prosthetics, other assistive technology was also stated to be widely used across the common era such as Braille, Wheel Chairs, Walkers, Spectacles etc.⁹

These pivotal discoveries and studies made by several scientist proves us that, the Assistive Technology is not an alien conceptualisation of the modern era development but it was an already existing technology which was used to elevate the lifestyle of the people living before and during the common era. Further the subsequent needs of such technology boosted its development and thereby acting us a module and making a great impact on our Modern Era. One of the few prominent examples of the Assistive Technology is the first Audiophone Bone Induction Amplifier which was invented in United States in the late 80s for enhancing the people with hearing disability.¹⁰

⁶ The Assistive Technology Act 2004, United States, retrieved from 06.1.2023

⁷ Niraj Parikh, Kratu Inc., “Brief History Of Assistive Technology”, retrieved from 07.1.2023, Brief History of Assistive Technology by Niraj Parikh - Kratu Inc.

⁸ History Of Prosthetics in Vedas and Literature, Books Fact, History of Prosthesis in Vedas and Literature - Rig Veda (booksfact.com), last updated on 14.05.2013

⁹ Matteo Zallio & Takumi Ohashi, The Evolution of Assistive Technology: A Literature Review of Technology Developments and Applications, Research Gate, (PDF) The Evolution of Assistive Technology: A Literature Review of Technology Developments and Applications (researchgate.net), last updated on January,2022

¹⁰ Assistive Technology History, HOME | assistive-technology (earshot103.wixsite.com), last retrieved from 11.01.2023

Several Researchers, Scholars, Scientist and Engineers had played a prominent role in the development of the Assistive Technology in the 21st Century, which has been a remarkable era portraying significant improvement in the growth of the Assistive technology.

Advancement of Assistive Technology has drastically improved the quality and lifestyle of the differently abled people by providing sustenance. The modernised version of the latest Assistive Technology are as follows – motorized wheelchair, ankle exoskeleton, contact lens, hearing aid, orthoses, screen readers, text to speech software, voice recognition programme, special keyboards, scooters etc.

The Scientist are positive that the immense growth of the Assistive Technology would amplify the conflicts faced by the differently abled people and would potentially turn their hostile environment into a vibrant contexture.

III. IMPACT OF ASSISTIVE TECHNOLOGY ON THE PEOPLE WITH SPECIAL NEEDS

The development of the Assistive Technology had bought an immense impact in the life of the Differently abled people. This system had exuberantly benefited the lives of the people with disability, senior citizens etc. This in toto had improved the quality of their life and had provided them freedom to independently act on their own means. Furthermore, the access to education and employment of the differently abled people has been made possible due to the evolvement of the assistive technology.

As per the study conducted in the Journal “*Disability and Rehabilitation*” it was found out that “*The Assistive Technology can contribute to improving the quality of life of people with disabilities, by providing them with a safe and secure environment and enabling them to participate in activities that would otherwise be difficult or impossible.*”¹¹

It is to be construed that the three important objectives of the Assistive Technology i.e, **Independence, Mobility and Communication** has been attained by the usage and support of the Assistive Technology. Whereas all these three objectives are paramount to enable a person to live a fulfilled life without any burden.

The Assistive Technology not only empowers people with special needs to live an independent life but also it helps them to live a dignified life. The other outsources of the Assistive Technology are that it helps the differently abled people to regulate their health. As a matter of fact, all these leads towards an increased life expectancy of the differently abled people.

¹¹ Marcia J. Scherer, Institute of Matching Person & Technology, Disability and Rehabilitation : Assistive Technology, Disability and Rehabilitation: Assistive Technology | Taylor & Francis Online (tandfonline.com)

IV. AWARENESS AND IMPLEMENTATION OF ASSISTIVE TECHNOLOGY FOR PEOPLE WITH SPECIAL NEEDS

“The best way to attain Right and Liberty is through Knowledge, Awareness and Implementation!”

The differently abled people will be able to attain their rights only when they are bestowed with the knowledge and awareness about their rights and liberty in the first place. It is predominant to mention that the Awareness, State Funds and Implementation are the core principle which can lead to the effective formulation and use of the Assistive Technology by the people with special needs.

Whereas according to the *United States* Research report, it has been established that, “1 billion people globally live with disabilities, and as many as 70 million of them live in India. In India, individuals with disabilities face barriers to success from non-existent or inaccessible infrastructure, as well as prejudicial beliefs and discriminatory laws.” Whereas the most vulnerable groups among the differently abled people are the Women and Children who face multitude of difficulties in leading a normal life. Further it has been established from time to time through the enforcement agency that, the crime rates have been increasingly committed against these vulnerable sectors of the society.¹²

The main core body that is responsible for elevating the rights of the differently abled peoples are the *National Institute For Persons With Multiple Disability*. Whereas, the conceptualisation and enforcement of the Assistive Technology falls under the umbrella domain of the *Ministry Of Social Justice Department Of India*.

One of the Special laws that explicitly governs the rights of the differently abled persons is “*The Rights of Persons With Disabilities Act 2016*”. Whereas *Section 40, 41 and 42* of the aforementioned Act conceptualizes the Accessibility towards the Differently abled people. As per the above-mentioned provisions, it shall be the absolute duty and responsibility of the State Government to propagate necessary arrangements for implementing the Assistive Technology cum Assistance to the differently abled persons.¹³

Several initiatives have been taken by the Governments to achieve effective propaganda an implementation of the same. As to the effect of which the Government had formed a Scheme named “*Assistance to Disabled Persons Scheme*” to rehabilitate the life of the differently abled

¹² Swathi Sathish, Assistive Technology, Assistive Technology - ClearIAS, last updated on 17.11.2022

¹³ The Rights of Persons with Disabilities Act, 2016

people by providing them funding facilities needed to purchase the Assistive Technology. Further several Campaign has been conducted around India for creating awareness among the Differently abled people.¹⁴

It is unfortunate as well as shocking to state that 80% of the differently abled people are not able to obtain an Assistive Technology due to insufficient implementation, funding and lack of awareness & knowledge. Due to this very fact the Differently abled people are unable to tangibly enforce their rights inspite of the existence of Law.

V. CONCLUSION

The **Implementation** and **Action** are the core principles which could cultivate growth and bring impact in the lives of People with Special Needs. One of the core objectives of the Assistive Technology is to enhance the life style of the differently abled people and the same could be attained through promoting and funding the companies that create tools for the development of such Technology. The major shortcoming faced by the People with special needs is their financial capacity in attaining the equipment's. The Government has to primarily focus on the fundings of the companies or sector for producing cost efficient Assistive Technology and should have a constant track to ensure that the Assistive Technology reaches the Differently abled people. The companies that create the Assistive Technology has to elevate the standard of such equipment or technology by improving the quality and by making it cost efficient. The Enforcement Agency, Judiciary, Legislative and the Government has to enforce the formation and regulation of Assistive Technology schemes all over India. The Women, Children and the Senior citizens, who are considered to be vulnerable has to be paid more attention. Whereas only few Governmental or Non-Governmental organisations have expanded their services to the benefit of the Differently Abled People. However, we are at a verge where the increase of population and the shoot up of disability level in people has outgrown and this requires more competence from the part of Government to provide and ensure that all people suffering from different levels and kinds of disability attains an Assistive Technology for living their life as equally as their fellow human being. However, it would be false to deny the truth that there are few selective organisations which conducts research-oriented services for the People with Special Needs. The sole motive of the Assistive Technology is to terminate the limitations and barriers propagated on the disabled people in living a fulfilled life. The Government, Scientist, Researchers, People and other prominent organisations has to come together to provide more service and research-oriented assistance for elevating the living standard of the Differently

¹⁴ Assistance to Disabled Person Scheme, Ministry of Social Justice Department of India

abled people located at Rural as well as Urban Area in India. The production and usage of the Assistive Technology has to be increased to give a better impact on the lives of the differently abled people and the same could be achieved by Proper fundings, Quality Assistive Technology products, Awareness, Knowledge and a proper Implementation.
