



TRENDS IN ASSISTIVE TECHNOLOGIES

ASSISTIVE TECHNOLOGIES EXECUTIVE SUMMARY

Assistive Technologies (AT) are devices or services that enable individuals with disabilities to perform tasks and navigate the world. For example, individuals with difficulty seeing can have their vision enhanced by wearing lenses, and individuals with difficulty walking can more easily move around with the assistance of a cane or a wheelchair. The enablement of individuals with disabilities is the crucial aim of assistive technologies. Unfortunately, there are many systemic barriers that prevent individuals with disabilities from accessing affordable AT to assist them in their everyday lives. In this paper, we will investigate the current state of assistive technology research by examining collegiate and commercial perspectives, the suppliers of AT, the current policies instituted by various nations, as well as policy suggestions that could potentially bridge systemic gaps.

In this paper, we highlight the incredible advancements universities have made through their degree programs, courses, research, and hackathon events to lead the innovation of assistive technology. Interviews with faculty revealed the work being done on campuses to address the lack of research and development in the commercial market. University labs such as the Human Engineering Engineering Research Lab at the University of Pittsburgh (HERL) and the Rehabilitation Engineering & Applied Research Laboratory (REAR Lab) at Georgia Tech are currently collecting critical data on the impact of wheelchairs on the body and lending their findings to international standards groups, such as the International Organization for Standardization (ISO). Furthermore, students and faculty within courses and hackathons are addressing the unmet needs of their community members by creating assistive technology devices that are not available commercially. Courses and hackathons provide an immediate benefit to PWD, but university degree programs have the greatest long-term impact for PWD by training future disability coordinators who will match individuals and students with appropriate AT, as well as future engineers who will innovate and design assistive technology for the commercial market. The main findings in our research reveal that exposure to the design process of assistive technology, as well as the lived experiences of PWD at the collegiate level, help promote inclusion and the rise of future leaders who have a greater perspective on people with varying abilities.

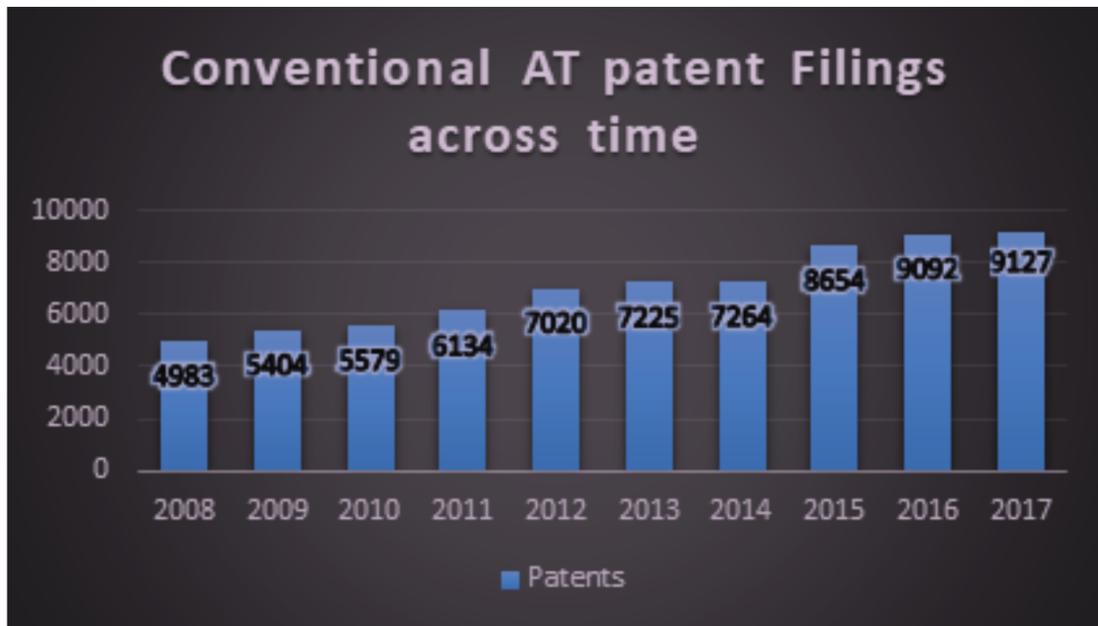
The report also explores the support and advancements of AT. It highlights the transformative and economically sound impact of investing in AT, the potential growth of the sector through data-driven facts, and the key market players of conventional and emerging technologies. Moreover, It helps us in understanding the technological readiness of the emerging technologies through findings from the World Intellectual Property Organization (WIPO).



Table 2. Breakdown of Economic Benefits from AT Access (ATScale)

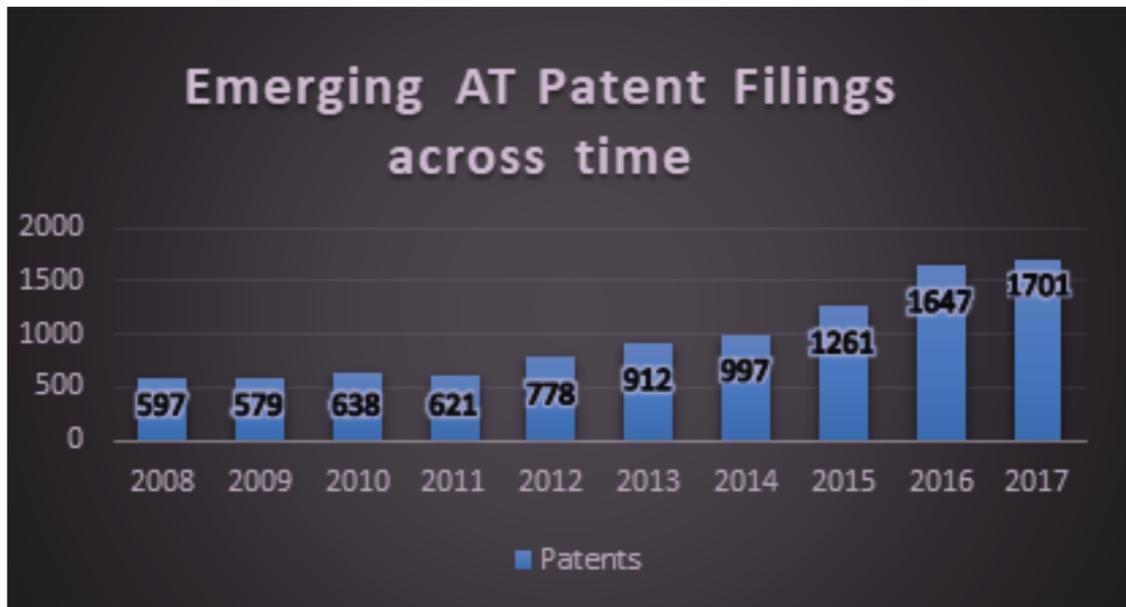
	HEARING AIDS		PROSTHESIS		EYEGLASSES		WHEELCHAIRS	
	Children	Adults	Children	Adults	Children	Adults	Children	Adults
Cohort size	4 million	50 million	5 million	30 million	20 million	830 million	10 million	50 million
Avg. Lifetime gains per user	~USD 59,500	~USD 2,800	~USD 246,300	~USD 8,400	~USD 76,800	~USD 4200	~USD 106,200	~USD 8100
Total lifetime gains	~USD 200 billion	~USD 100 billion	~USD 1,200 billion	~USD 300 billion	~USD 1,700 billion	~USD 3,600 billion	~USD 1,000 billion	~USD 400 billion

Key points of the patent data analysis by WIPO present that most of the patterning activities in the past two decades refer to conventional AT for example patent filings were at 9127 in 2017 highest in the research period as compared to 1701 in the same year for emerging AT, but, in the present time, smaller areas of emerging AT are growing three times faster.



With emerging trends in assistive technology, product development has expanded the previous boundaries and has reached enhancements and, in some cases, even recovery of human functions.





Suppliers, manufacturers, software developers, and dealers who produce and commercialize assistive technology products and services in low-and-middle income countries tend to be small-scale. This paper highlights the current AT landscape using first-hand perspectives of the AT producers and suppliers, gathered from surveys and interviews supplemented with an extensive research of online databases and global market research data of existing and upcoming tools and technology for visual impairments, mobility products, hearing aids, assistive software for learning disabilities, and augmentative and alternative communication devices for speech impairments. Our findings reveal the current limitations to access and awareness of existing products and suggest a greater need for policies that support AT producers and users through financial assistance and training or resources that connect people with the tools they need. Policy plays an extremely important role in any industry. Regulation determines the pace at which future innovation comes to fruition. The same is true in the AT industry. Policies from countries and international unions and organizations have shaped the new advancements in the AT industry as well as improved access to AT. Policies such as the Americans with Disabilities Act (ADA) and the Disabilities Act of 1988 have set precedent for international legislation 30 years after they have passed. The policies of the future should encompass the expected growth in the AT industry and find ways to finance the development and procurement of next-generation AT. The policies and programs should encourage the study of AT in education programs as well as emphasize the importance of Universal Design when designing new products. College labs working on new research and development of new AT technology as well as orphan AT devices should have access to a greater pool of funding options, including grants and private sponsors. Lastly, the commercial AT industry should demonstrate the economic value of the future AT market and that PWD are valuable members of society.



The work of NGOs is also crucial to ensuring that people with disabilities get access to AT and other resources and services. Many NGOs offer services such as training courses to learn how to use AT, device loans, webinars and conferences, as well as resource banks with information about manufacturers of AT, and more. Additionally, many NGOs have also created their own research projects and programs that focus on better understanding the gaps in the AT industry and ways to create an equitable environment within the industry. These programs and events are important for people with disabilities and their families to get a better understanding of AT options and to spread awareness.

ATs provide major social, economic, and health benefits for people with disabilities and are, thus, incredibly important, as these technologies allow them to lead independent lives. Everyone should be able to access the AT they need, and it is imperative that we take the necessary steps to ensure that future generations will thrive.



ABOUT THE AUTHORS

Shreya Ramesh was the project manager for this project and Leo Joseph, Sachi Pawooskar, Syed Raza and Katie Kenny were researchers.

Shreya Ramesh is a student of University of California who is passionate about creating equitable healthcare solutions for PwDs.

Leo Joseph is a student of West Valley College and is motivated to make a change and provide equitable access to resources to people regardless of ability.

Sachi Pawooskar is a student of University of Southern California who dreams of designing assistive devices.

Syed Raza is a student of Aligarh Muslim University and has interest in using his knowledge to explore Assistive technology.

Katie Kenny is a student at the University of California. She created an oral ipad stylus for a young girl born with upper body mobility impairment and that made her realize lack of access to SAPs and was motivated to explore more about Assistive Technology.

ACKNOWLEDGEMENTS

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WHY THIS MATTERS TO VOSAP

VOSAP has made 360 degree efforts to promote the use of assistive technologies for the enablement and empowerment of SAPs. This research project investigated the current state of assistive technology research by examining collegiate and commercial perspectives, the suppliers of AT, the current policies instituted by various nations, as well as policy suggestions that could potentially bridge systemic gaps.

ABOUT VOICE OF SPECIALLY ABLED PEOPLE INC

Voice of Specially Abled People (VOSAP) is a global advocacy organization built on the principles of Empowerment of Specially Abled People. In Special Consultative Status with UN ECOSOC, VOSAP is working to create an Inclusive and Accessible world by accelerating implementation of UN Sustainable Development Goals (SDGs) and goals of UN CRPD (Convention on the Rights of Persons with Disabilities) treaty. In addition to enabling individuals with assistive devices, surgical interventions, scholarships etc, VOSAP has created innovative digital transformation tools to promote inclusion of Person with disabilities such as (a) Virtual Art Gallery on Disability to educate masses on disability and promote inclusion, (b) create crowd-source demand for accessibility of public places and create mass movement of virtually connected $\approx 10,000+$ volunteers/changemakers using VOSAP App.

