

“Timing is Everything”
**Developing a new Assistive Technology service delivery model in
Israel during the COVID-19 pandemic**

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Abstract. Though technological solutions are often described as holding a great promise for the equal, dignified, and independent living of their owners, they seem to be short of reaching their full potential. This is the result of many intervening and interconnected factors such as lack of awareness, partial accessibility to solutions and services, funding policies and a crucial need of developing and implementing effective service delivery models. The COVID-19 pandemic erupted in early 2020, led to far-reaching consequences for all aspects of society, including the health and welfare systems. In such complex conditions, where many health services are delivered remotely and priorities change, people with disabilities who use Assistive Technology (AT) are likely to be highly effected. It is therefore, that especially during the pandemic, an AT ecosystem, including comprehensive and adaptive service delivery models, must be present to ensure optimal AT access, consultation, provision, and use. This article describes the design and implementation process of a new service delivery model for AT in Israel, that set into action with the beginning of the COVID-19 pandemic. Insights and lessons learned from previous models are highlighted, an outline of the new model is explained, the “Smart homes” program, as an exemplary program, is presented, and the interconnecting effects of the COVID-19 pandemic on the new service model are further explained. Recommendations regarding a hybrid service delivery model for AT are discussed.

Keywords: People with Disabilities, Assistive Technology, Service Delivery Model, COVID-19, Digital Platforms, Hybrid Models, Governmental Services, Funding Mechanisms.

1 The AT Service Delivery Model Landscape in Israel

Technological solutions for people with disabilities (PWD) that suit their unique abilities, needs and preferences, environmental context, and personal goals, can serve as a powerful enabler of independent functioning and participation. Though technological solutions are often described as holding a great promise for equal, dignified, and independent living, they have not reached their full potential. The WHO [1] reports that only one out of ten people globally have access to Assistive Technology (AT). This is the result of many interconnected factors such as lack of awareness of what solutions exist, partial accessibility to solutions and services, limited funding policies, and a need for developing and implementing service delivery models to increase access [2].

An AAATE position paper [3] identified seven basic steps for an AT service delivery model. A recent international review revealed that different countries adopt different models of access and provision of AT, which diverge in several aspects. Some are comprehensive programs offering an individualized package of services and solutions, in which AT is one of many possible solutions meeting individual needs; some focus solely on the provision of AT, and some are limited to several components of AT such as providing information, demonstrating the devices, or helping obtain a loan to purchase equipment. The programs also diverge at the level of individual involvement in the process, from choosing the technology, funding, and owning the equipment. Some are based on an itemized list of devices, some on categories of devices, and some dispense with a list of devices altogether [4]. In Israel, eligibility for AT services is divided between several ministries, depending on the relevant ministry that provides services to each disability and functional need. The models of AT provision vary considerably between those governmental ministries (see Table 1).

Table 1. Differences between Israeli ministries providing AT services

Ministerial office	Population	Type of support	Type of solutions
The National Insurance Institute – the Rehabilitation Department	PWD in a vocational rehabilitation program, job training, academic, or professional training	One time support, full or partial funding	Computer and communication solutions aimed at vocational rehabilitation
The Rehabilitation and Mobility Unit at the Ministry of Health	People with a permanent disability (visual, hearing, physical, psychosocial)	Long term lending, full or partial funding	Mobility devices, prostheses and orthoses, rehabilitation devices, augmentative, and alternative communication (AAC), hearing aids
The Mental Health rehabilitation arm (Sal Shikum) at the Ministry of Health	People with a mental health disability	Services including courses and limited funding for products every five years.	Daily living products (Bed, couch, closet etc.), computer
The Administration of people with disabilities at the	PWD (visual, hearing, psychosocial, intellectual, and physical)	Subsidy for AT ranges between 10% to 90% every 4	Mobility and seating, hearing, vision and communication devices, self-care and

Ministry of Welfare and Social Services		years. Full of partial funding. Lending options	safety solutions, computer accessibility solutions
The Employment arm at the Ministry of Economy and Industry	Employers hiring PWD, PWD in job training	Matching funding between employer support and the ministry	Computer accessibility solutions, hearing and vision devices, aimed at improving work functioning
The Special Education Department at the Ministry of Education	Students with disabilities in special education (until age 21)	AT package according to disability – one time purchase with an option to apply for upgrade or changes if needed.	Computer and computer accessibility solutions, tablets, amplifiers, AAC
The Ministry of Defense	PWD due to a military or terrorism related injury	Full or partial funding	Mobility devices, prostheses and orthoses, orthopedic products, hearing and vision devices, for educational and vocational purposes

Long term and broad examination of the models, based on the lived experiences and insights of service recipients, and the experience gained by other stakeholders such as ministry officials, service providers and suppliers, has led to the understanding that the described process entails lacunas that should be addressed: 1. **Limited list of eligible solutions** – the existence of a fixed list, as wide and diversified as it may be, can never serve as a good enough answer for the different, continuously changing, and unique users' needs – “one size does not fit all”. 2. **Setting the level of subsidization per solution** – it has been shown that when the different ministries set a bar for the maximal amount of funding per solution, it eventually interferes with the dynamics of the market. It has been found that the publication of the level of subsidization per solution can create a possible stagnation in market prices. 3. **Low access to AT consultation and guidance** – though users can receive AT recommendations from professionals or seasoned users, it is often not the case. Many users rely on general “word to mouth” suggestions and tend to report having experiences of frustration or disappointment due to a mismatch between their personal goals and the solution purchased. To prevent abandonment and misuse, the match between the user and the solution needs to holistically consider users' abilities and needs, goals, and preferences. In addition, it has been shown to be highly important that the person will be provided with multiple possibilities that he/she can choose from instead of having a sole “prescription” of a single solution. 4. **Lack of flexibility in proposed eligible technological solutions** – technology is dynamic, developing, and upgraded continuously. If the ministry is interested in providing the relevant technology to the person, in any given time, flexibility is of an essence. In the current model, the subsidized solutions are fixed, based on a bid for five years, that prevents opening the market towards this much-needed flexibility.

Considering these shortcomings, JDC Israel Unlimited, The Ministry of Welfare, Digital Israel, the Ministry of Health, and the Ministry of Education, have convened to re-examine current service delivery models for AT in Israel. Based on extensive market

research and widespread client journey mapping, involving all stakeholders, a first detailed action plan was developed in 2019 and put into action. The plan included a digital transformation scheme, the reshaping of funding mechanisms, market opening steps and suggested training programs for service recipients and providers. Chronologically, the starting point for this groundbreaking process has aligned with the outbreak of the COVID-19 pandemic in Israel. This has given all stakeholders the unique opportunity of reevaluating service delivery models in a changing reality, when the need for efficient, online, digital services has increased significantly and the need for technological solutions for PWD could not be more important and crucial in all walks of life. As will be shown later in this article, the process of change has not only been free of additional delays and obstacles, as one would imagine the pandemic would cause, but rather has been further validated and encouraged because of the dominant role technology played in daily functioning of people during the pandemic and even more so for PWD.

2 COVID-19 pandemic – effects on remote services and AT

The COVID-19 pandemic erupted in Israel in February 2020, leading to far-reaching consequences for all aspects of Israeli society. Data collected during the crisis in Israel clearly shows significant effects on PWD and their families, especially due to the threat on the stability and continuity of services [5-6]. Changes to services delivery were also related to the increased use in remote treatment. Both clients and allied health professionals reported numerous advantages to this new mode, including flexibility, simplified logistics, maintaining continuity of treatment during lockdowns, the possibility of involving caregivers in the treatment and seeing clients in their home setting. Both groups also reported challenges, including difficulty maintaining concentration, reduced quality of the relationship, technical limitations, and unsuitability to some health conditions. These studies emphasize the importance of a hybrid model of therapy (digital + face-to-face) [7-8]. The restrictive measures have also influenced how families interact with and support their relatives living in residential settings. The findings indicated that most family members adopted remote communication technologies to contact their relatives. The families were able to provide emotional support and advocacy using digital technologies but were limited in their ability to provide significant social support [9].

In such complex conditions, where many health services are delivered remotely and priorities change, people who lack access to AT are likely to be specifically disadvantaged. It was therefore stressed that, especially during the pandemic, an AT ecosystem must be present for the safe and effective provision and use of AT, to ensure that products are available and fit for purpose [10]. It was similarly argued that governments must coordinate policies to deal with underlying weaknesses in their systems and to assure good information, access to AT, benefits, and financial support to ensure more independence especially during such a crisis. Recommendations regarding the use of remote digital services, online AT purchases and capacity building of AT personnel were also provided [11]. Two such processes – of creating a full and seamless service

delivery model from assessment to provision and building an ecosystem for AT in the shape of a generalized service – will be shown in two exemplary programs. These programs were developed prior to the COVID-19 pandemic and adapted in response to the challenges and opportunities created by the crisis. One is an intra-ministerial program, and the other is a cross-ministerial program, developed hand in hand to maximize the learning, while addressing the needs of various populations.

2.1 Intra-ministerial service design – Ministry of Welfare and Social Services

Since 2017, the Administration for People with Disabilities in the Ministry of Welfare and Social Services is implementing fundamental changes, towards a client centered, ICF based approach regarding clients' needs and goals. The field of AT has received a special attention and resource allocation. Today, a new service delivery model is designed regarding AT identification, selection, provision, and use, both for people who live independently in the community and for people who live in all kinds of residential settings. Based on an assessment of the current AT service model provided by the ministry, a list of insights and next steps for improvement were suggested (see Table 2).

Table 2. Insights and next steps for AT service model in the Ministry of Welfare

Topic	Insights	Next steps
AT consultations	There is a need for supporting systems to cope with integration of multiple considerations and large amount of data regarding AT needs	Interfacing with the Atvisor Digital Platform that has an updated list of technological solutions, mapped according to the ICF, and can match between the user profile and the technology [12]
Guidance and implementation support	Continuous professional support helps prevent AT abandonment and waste of public funds	<ol style="list-style-type: none"> 1. Training of Instructors 2. Developing an Online Support Center
Funding and governmental support method	Subsidies for specific products can create a condition of price stagnations, AT fixed list prevents client-tailored customization	<ol style="list-style-type: none"> 1. Creating new AT funding baskets based on personal budgeting rather than on a list of products. 2. Rewarding suppliers according to quality of products and services criteria
Trial opportunities	Trial opportunities help prevent AT abandonment and waste of public funds	Establishing loaning centers for expensive and unique AT
Re-used AT	There is a need to lower the cost of AT for people who have difficulty paying for it	Establish a mechanism for handling, maintaining, and providing reused AT

Information about rights	There is a need to provide clients with additional information relevant to the decision-making process and their rights regarding AT	<ol style="list-style-type: none"> 1. Atvisor platform 2. Customer Personal Area 3. Dedicated instructors
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The development of the new service for technological solutions for PWD implemented in the Ministry of Welfare and Social Services includes the following components:

Digital literacy courses for AT users – a three-levels programs for digital orientation, adapted to the type of disability and necessary accommodations, to support AT use: Basic program – digital orientation in a smartphone and a computer. This program will offer basic operation principles and recommended techniques; Level 2 program – relevant to those with basic computer and smartphone skills. The program offers instructions on how to order relevant services via mobile or computer, filing digital forms, and more; Advanced program – relevant to those who have basic and level 2 digital orientation. The program offers techniques for creating social connections online, while acquiring social codes of conduct, safe purchasing online, options to expand knowledge through online resources, which emphasize critical thinking and responsible use; **Technological solutions for daily functioning** – AT, accessible technologies, and mainstream technologies are funded for clients to support their various needs. The service model is a hybrid service, including a digital platform, Atvisor, that offers matches between the user's profile and the relevant technological solution, and a professional coordinator, that provides insights regarding the best solution from the offered choices based on the user's preferences and environment. The platform and service operate according to the AAATE model and steps and include: Needs assessment – In-depth intake to understand needs and functioning possibilities; Definition of the functioning domain and the activity the person is interested in; Selection of technology – includes the selection of the category and the selection of the product itself – a shared decision-making process between person and professional (if needed); Purchase – the purchasing process is conducted online, in a subsidized co-payment model; Delivery and installation (if needed); Training – how to use the product (if needed); Follow up and support provided by technical and professional experts; **Mainstream affordable and accessible technologies** – many solutions in the market are not designed specifically for PWD but are highly suitable and beneficial for people with certain limitations and difficulties in functioning. Due to their popularity, they are affordable and highly available. It is important to make the public aware of such solutions, including information about suppliers and prices, through the Atvisor platform and other means of information delivery; **Support and funding of technological solutions** – to avoid interference with market pricing, funding is designed to be given as a package to the person and not paid “per product” to the supplier. This method will also allow for an “open market” approach that will broaden user's options for choosing and purchasing technology. In parallel, efforts are being made to synchronize services with other ministries to avoid double-funding and optimize eligibility; **Follow up and support call-center** – the use of

technological solutions requires remote support in situations involving operating issues. The support center will be operated by AT professionals via phone, chats, or online video consultations; **Display and Demonstration Centre (DDC)** – this physical retail center, designed both as a shop and a display center, is designed to answer the need of clients to see or feel the product they are buying instead of choosing online. The DDC will be connected to the digital platform and every purchase done there will be operated digitally. Consultation kiosks with the hybrid solution of professionals available digitally will be provided in the physical center as in the virtual space; **Resource center for re-used technological solutions** – frequent changes in clients' conditions and needs are resulting in a considerable amount of good quality products that are not in use. Since it is a high-cost market, it is very important to build a designated market for re-used technologies, that will be managed by a technical team that has the capabilities to examine the state of the products and whether they can be re-used. Such a center is a part of the process and will be set into action in the second phase of the program.

2.2 A cross-ministerial service design - The “Smart Home” Model

The program was initiated by JDC Israel unlimited in partnership with Digital Israel, the Ministries of Welfare and Social Services, Health, Education, and Finance. A pilot program currently underway, aimed at promoting the independent living of PWD, examines the introduction of technological solutions to a wide range of populations. The goal of the program is to build governmental mechanisms for the assessment, provision, and funding of technological solutions while ensuring that the person is involved in choosing-getting-and-keeping the solution that best fits their needs. The program is operated by Beit Issie Shapiro and the Atvisor digital platform. The Myers-JDC-Brookdale Institute conducts long-term research to accompany the development and testing process. The program services people with multiple disabilities and different levels of functioning, living in different environments, ranging between 15-67 years of age. The program team includes seasoned occupational therapists, aiding in the matching process between users' needs, activity goals, environment, and preferences, and the technological solutions that can be of interest and relevance to them. Their role is also to provide guidance and training following the provision and installation of the technology to ensure sustainability. The service provided in the program is based on the principles of the [3], with the following steps: Introductory meeting with user – assessing goals, preferences, and needs; Technology “hunt” – looking for the right AT category and solution; Provision and delivery – of the solution selected; Installation – provided by a technical team and electricians; Training and follow up support – provided by AT Coordinators. The whole process, from registration through assessment and selection, is facilitated by the Atvisor platform that supports the matching between the personal profile and the technology. The platform is based on the ICF taxonomy and contains technological solutions that can be purchased online and offline. During COVID-19 outbreak, steps 1,2 and 5 were operated remotely, using video calls and the Atvisor digital platform. Step 3 was made possible thanks to the definition of AT suppliers and technical teams as necessary staff, which enabled physical delivery and

installation. Comprehensive work protocols were developed and disseminated among team members, webinars for professionals and users were facilitated to increase awareness and use, and a digital call for action titled “smart home goes online” was published on social media to encourage participants to join the program.

Special attention is given in the program to those populations with disabilities who are rarely perceived as needing AT for their needs, such as people with autism, people with mental health conditions, etc. The collaboration with the Mental Health Rehabilitation Unit at the Ministry of Health enabled in-depth learning of the needs and possible solutions relevant to these populations. In an information packet [13] currently in press, several needs were identified amongst people with mental health conditions in which technology might assist in their daily functioning and independence. This process is a part of a larger, long-term design of services towards technology implementation done in the ministry. As an example, in the last two years, especially during the pandemic, designated courses for digital orientation were executed, taking into consideration varied personal needs and goals, and offered together with a financial support for educational purposes. One of the main conclusions reached during the piloting of the "Smart Home" program was the need to raise awareness and knowledge in this area. A webinar on technologies and applications for Mental Health was held successfully with almost 300 participants – clients, professionals, and family members. 31 clients with mental health conditions have participated in the program so far.

Accompanying research: The “Smart Home” program is accompanied by a formative evaluation research, done by the Myers-JDC-Brookdale research institute. This research began in the pre-pilot phase in 2018 and continues today. Its goal is to identify the influence of the technological solutions on the quality of life, independence level and sense of security of participants and their caregivers, as well as identifying barriers in the program's implementation and goal achievement. So far, the research has included an international review of services for AT provision and an assessment of the pre-pilot. The pre-pilot assessment included qualitative interviews with different stakeholders, mainly clients and caregivers. Currently, the research team is assessing the pilot phase, that includes: An online questionnaire answered independently before and after the provision of the selected technological solution. This is answered by the participant or on their behalf if needed; Comprehensive interviews with participants done in their homes; Interviews with relatives and caregivers; Shared observation conducted with the participant on the use of the selected technological solution provided by the program. This research is currently at its data collection stage, which is estimated to end by July 2022. So far, 20 participants have answered the questionnaire after receiving the selected solution – 13 participants responded regarding two solutions and seven responded regarding one solution, totaling in 33 AT solutions, that data were received about. The initial findings provide the following insights: High percentages of technological solution are being used every time or almost every time the person need them (94%); No difficulty or very mild difficulty in adjusting to the technological solution (97%); For 88% of the solutions, participants confirmed the product is fitted to their

needs. These high percentages suggest that there is a good fit between the participant and the selected technology, as well as emphasize the importance of proper guidance, training and follow up and support using the technology. As to the influence of the technological solutions on the life of the participant, for 33 solutions, it was found that: for 73% of the technological solutions, it was stated that they are enabling the participant to do things they couldn't do before; for 85% of the technological solutions, it was stated that they make the participant feel more independent; for 79% of the technological solutions, it was stated that they make the participant feel more safe and secure; for 76% of the technological solutions, it was stated that they save time or other resources for the participants; for 85% of the technological solutions, it was stated that they improve the quality of life of the participants; for 79% of the technological solutions, it was stated that they make the participant feel more self-confident during use. In general, it can be suggested that based on the initial data collected, the technological solutions selected and used in the framework of the hybrid design of the service model (digital + expert), allows more independence in functioning, while improving the quality of life of clients.

3 Discussion and recommendations

The development of a framework that integrates a client-centered approach with the ICF model, using a digital platform, shared decision processes and AT service delivery models, was accelerated due to the COVID-19 pandemic. As timing is an important agent of change, it seems that igniting the process on a system level and on the ground during the COVID-19 pandemic has only highlighted the core components of the model being developed and emphasized its value. Moving forward, a cross-ministry AT service model will be designed and implemented based on the lessons learned from the two projects described in this article. The core principles for the new Israeli model are:

1. **Establishment of a hybrid service for AT** – human resources (users, AT experts and technical team) and a digital platform (clinical decision support system and marketplace components).
2. **One stop shop** – enabling a full process in one place – from assessment to provision and use.
3. **Connecting all stakeholders** to one platform for best coordination and communication.
4. **Personal tailoring** – solution search and selection stems from the personal profile of each user.
5. **Interface with government funding and provision systems** – for online immediate funding.
6. **Reshaping funding mechanisms** – moving to a personal budget concept based on tailored recommendations instead of a general list of approved solutions.

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