

SERVICE DELIVERY SYSTEMS FOR ASSISTIVE TECHNOLOGY IN EUROPE

Position Paper

Summary

The purpose of this paper is to indicate a framework for exploiting the role of **assistive technology (AT)** in supporting care and participation of people with disabilities and elderly people through appropriate **service delivery systems (SDS)**.

The paper is based on the findings of the **AAATE / EASTIN workshop** “Service Delivery Systems on Assistive Technology in Europe” (held in Copenhagen on May 21-22, 2012, under the patronage of the Danish EU Presidency), on the roadmaps indicated by the previous **HEART Study** published in 1995 by the European Commission, and on a consensus process within the Board of the AAATE (Association for Advancement of Assistive Technology in Europe) and the EASTIN Association (European Assistive Technology Information Network).

The first chapter (**Background**) discusses the reasons why a position paper on this issue was deemed useful; it also summarises the key themes of the Copenhagen workshop and recalls the HEART Study.

The second chapter (**The scope of an AT SDS**), discusses the concept of **assistive solutions** – intended as individualised interventions providing users with appropriate environmental facilitators (AT products, personalised environmental modifications, personal assistance) to overcome disability and enable participation in all aspects of life – and the **mission of a SDS** – ensuring that all people with disabilities can access appropriate assistive solutions that are able to support autonomy in their life environment. The paper also points out that **AT service delivery policies** should be well coordinated with **accessibility policies** i.e. those related to infrastructural interventions ensuring that the mainstream environment, products and services are usable by all people, including those with reduced function or who depend on assistive technology.

The third chapter (**Basic features of an AT SDS**) discusses why public SDS are needed for AT, what the main AT SDS models are, and how a SDS process can be described and monitored in terms of quality.

The discussion is organised into answers to eight research questions: 1) *Are assistive technology products going to disappear in the future, due to the embodiment of accessibility features in mainstream products;* 2) *Why shouldn't assistive technology products be dealt with as common consumer goods, purchased directly by users without the intermediation of service delivery systems;* 3) *Are there different approaches for AT service delivery;* 4) *When can a medical model, or a social model, or a consumer model be considered appropriate;* 5) *Independently of the model and the Country or Region, is it possible to identify common steps in the service delivery process;* 6) *How does each step influence the costs and the outcomes of the whole process;* 7) *How can the SDS process be monitored by quality indicators;* and 8) *How can information support the service delivery process.*

The last chapter (**Some recommendations**) provides a number of useful recommendations for those who are engaged in the design, development and implementation of AT SDS policies. The recommendations are clustered round the six SDS quality indicators suggested by the HEART Study: *Accessibility, Competence, Coordination, Efficiency, Flexibility, User Influence*. The list includes either previous HEART recommendations that are still valid today – in some cases reformulated in such a way to better fit today's context and remove obsolete references – or new recommendations produced in the Copenhagen workshop and in the consensus process that followed. The list is divided into two sections: the former focuses on recommendations for improvement at national or local level, the latter on action at EU level that could facilitate or support improvement.

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Background

The need for efficient and evidence-based service delivery systems

Europe has an ageing population. Demographic changes and progress in health sciences – resulting in increased life expectancy and survival to traumas or illnesses – are increasing the number of citizens who are living with disabilities, within a context of reduced public resources. The great potential of technology in supporting daily life needs of older people and people with disability has been scarcely exploited in the public care systems so far. The more technology advances and opens up new possibilities, the more it should be considered as an intrinsic component of a care system; this means not only making technology available, but also ensuring effective processes of matching each individual user with the most appropriate technology.

The purpose of this paper is to indicate a framework for exploiting the role of assistive technology in supporting care and participation of people with disabilities and elderly people through appropriate service delivery systems.

The **UN Convention on the Rights of People with Disabilities** – among many other things – commits the signing States to enforce appropriate measures to facilitate access to **assistive technologies (AT)** for those who need them to improve independence in daily life and to participate in society on an equal basis with others.

Public **AT service delivery systems** have been in place in many European Countries for many years, as part of their national or regional welfare systems. The various systems differ significantly from each other, in relation to each Country's disability policy, socio-economic context and history. A system may be considered more or less advanced than others; however, no system recognizes itself as "**perfect**".

It is probably impossible to design a "perfect" AT service delivery system that is applicable in every country in the EU. Provision of AT is just one element of each country's healthcare and social support policy, which in turn is related to its geographical, historical, political and legislative context. Thus each country needs to design systems that are best tailored to its context. However, the experience of each system existing in Europe teaches lessons from which any other Country could learn. Sharing such experiences and views greatly helps to understand to which extent "good practices" could be exported from one Country to another, what the key principles of a today's "ideal" AT service delivery system are, and what roadmaps could be envisaged for a better future. Indeed, the experience of service delivery practice suggests that in each Country **there is room for improvement**, especially in relation to the new challenges brought on by today's rapidly changing society. It is also worth mentioning that in the spirit of the UN Convention, that completes the shift from a "medical model" to a "citizenship model" of disability, people with disabilities should be included in any decision making process on issues that are relevant to them, including the design of service delivery policies.

Within today's political climate of budget containment and accountability, calling for **evidence-based practice**, there is an increasing demand for evidence of the cost-effectiveness of any public support system for the users' personal needs. Information should be available on the **effectiveness** of an AT service delivery system in meeting the citizens' needs, on how much its **social cost** is, on how it performs against appropriate **quality** indicators. **Policy makers** and financing agencies need such an information to properly allocate resources, control how efficiently they are used, stimulate the market, identify priority areas for research, understand possible wider implications at an overall societal level; **professionals** working in health care and social services need to know whether their AT choices have proved effective within the intervention program, useful for the client, and efficient in

using resources; **users** and **user organizations** require to be fully involved in decision making processes and to bring their expertise in this discussion.

The Copenhagen Workshop

In relation to this topic, an International Workshop was held in Copenhagen on May 21-22, 2012 in order to gather and discuss the most important **experiences**, and identify **recommendations for good practices** concerning an “ideal” delivery system. The workshop attendance included policy makers, scientists and other experts (professionals in health, social services and education). It gave the opportunity to all participants to learn from each other’s experience, to investigate how the various service delivery systems could evolve to **best meet the user’s needs** and to be at the same time **sustainable on the long run**, and discuss possible **roadmaps** for all actors involved.

The Workshop was organized by the **Danish Ministry of Social Affairs and Integration**, in collaboration with the **AAATE** (Association for the Advancement of Assistive Technology in Europe - the interdisciplinary pan-European association devoted to all aspects of assistive technology, such as use, research, development, manufacture, supply, provision and policy), the **EASTIN** Association (the European Information Network on Assistive Technology) and **Health and Rehab Scandinavia** (the biggest exhibition of assistive products in Northern Europe, which took place on May 22-24). The workshop was officially included in the calendar of events of the **Danish Presidency of the Council of the European Union 2012**.

The workshop was composed of 5 sessions.

The **first and the second session** looked at some examples of how public service delivery systems work in different Countries (Denmark, Italy, Hungary, Sweden, Latvia, Slovakia and Finland). This brief survey included systems mainly based on a “health” model, systems mainly based on a “social” model, systems mainly based on a “consumer” model and systems in transition stage. Although a well-defined boundary among the three models is only theoretical – most systems usually combine the three models in various ways, depending on the type of assistive technology or on the users’ profile – the session helped discuss the pros and cons of the various approaches and the challenges they face in today’s rapidly changing society. The role of EU-wide networks – such as the AAATE and the EASTIN – was also discussed to support users empowerment and system effectiveness.

The **third session** looked at key issues and challenges that are common to any AT service delivery system, analyzed by different perspectives. The discussion framework was provided by the findings of the previous HEART Study of the European Commission, and of a recent Irish study that offers a thematic analysis based on the AT provision system in six Countries (Italy, Great Britain, Denmark, The Netherlands, Norway and Denmark)¹. Other contributions offered the viewpoints of various stakeholders (user organisations, service providers, health care professionals).

In the **fourth** session, the participants were divided into three parallel working groups:

- WG 1 addressed research questions related to **organizational models**: “How should the ideal system be designed so as to promote innovation, AT market and to meet the citizens’ needs?”

¹ The study was conducted for the National Disability Authority in Ireland, with a view to identifying good practice that could inform the development of the Irish AT provision system. Other countries covered included Denmark, Norway, Netherlands, Italy, UK and Germany. Topics addressed include the policy importance given to AT, universality and the public-private mix, coverage across settings and the lifecycle, quality aspects of AT systems and services, market functioning and costs, and developments in other areas that are partly related to AT such as telecare, telehealth, ambient assisted living etc. The full report of the Study has been published and is publicly available from the website of the National Disability Authority www.nda.ie

- WG2 addressed research questions related to expertise: “How to ensure the user influence in selecting AT? What are the appropriate professional roles within an ideal system? What should be the appropriate educational standards?”
- WG3 addressed research questions related to **effectiveness**: “What are the appropriate outcome indicators for an ideal system? What are the appropriate cost indicators ? How should cost-control/containment methods be appropriately implemented, such as public procurement procedures, recycling processes, etc.?”

The **final plenary session** was devoted to reporting the findings of each group, collecting additional inputs and discussing the roadmap ahead. The **proceedings** (including the agenda, the unabridged reports of the parallel working groups and the plenary discussion, and all the material provided by the presenters) can be downloaded from the website of the AAATE (www.aaate.net).

The previous HEART Report on Service Delivery

This **position paper** is initially based on the thoughts generated in this workshop, followed by a literature analysis, and a consensus process via mail **consultations** in which a lot of members of the promoting Organisations provided valuable contributions.

It is worth mentioning that the Copenhagen Workshop wasn't the first European event devoted to AT service delivery. Almost twenty years ago (1993-94) a EU-funded study called HEART (Horizontal European Activity on Rehabilitation Technology) addressed this issue for the first time at EU level. It generated a number of recommendations that – although requiring some contextualisation – can be considered still valid today. This is the reason why the Final Report of the HEART Study devoted to Service Delivery is provided along with this position paper, appropriately revised and commented to allow the reader to reframe it in the current times.

The scope of an Assistive Technology service delivery system

Assistive Technology as basic component of individual Assistive Solutions

Assistive Technology (AT) is an umbrella term indicating any product or technology-based service that enables people of all ages with activity limitations in their daily life, education, work or leisure². There is an international classification of products falling within the concept of “assistive technology” – the ISO 9999:2011 standard – that is currently used by most national information systems in Europe and by the European Assistive Technology Information Network (EASTIN) as well.

This definition is quite broad and includes not only devices that have been purposely designed for people with disabilities. Indeed, the border between “assistive” and “mainstream” technologies is sometimes blurred, in that it is possible sometimes to design assistive solutions by assembling mainstream technologies. In general, the solution to an individual need may sometimes involve something more than just a device: it often requires a mix of mainstream and assistive technology products, whose assembly and configuration may be different from one individual to another, and from one context to another; it may involve some **personalised environmental modifications**, for instance the adaptation of a bathroom, or a kitchen, or a worksite; for certain people it may also require some **personal assistance**³, to a lesser or greater extent in relation to the individual needs and the context. Altogether, all these products and interventions build up the personalised **assistive solution**⁴.

Most Service Delivery Systems in Europe put boundaries to the set of assistive solutions that are eligible for public provision. Some systems have a broader scope, with a large amount of products included as eligible for funding, while others have a narrower scope often limited to products such as prosthetics, orthotics, footwear, hearing aids, wheelchairs and maybe some other device, with focus on functions replacement or compensation, rather than on activity support or environmental improvement. Some Countries consider **assistive technology**, **personal assistance** and individual **environmental adaptations** within the same provision scheme, while others have separated procedures and responsible Bodies. In some Countries – or even in Regions within a Country – there may be different systems in place for **different types of assistive solutions** (e.g. prosthetic/orthotics; wheelchairs; home adaptations; daily life equipment; ICT equipment etc.), or for **different people** (young, elderly etc.), disablements (blind, deaf, etc.), pathologies, certifications (e.g. “civilian invalidity” rather than “occupational invalidity”), or for **different application domains** (employment, school, domestic life etc.). The different systems are not always well-coordinated with each other or well-linked to other interventions (rehabilitation treatment, home care plans, educational programme etc.): which may lead to inefficiencies, unreasonable waiting lists, or multiple doors the user has to knock at.

² Definition recommended by the AAATE (www.aaate.net)

³ The UN Convention defines personal assistance as any form of human help “...necessary to support living and inclusion in the community, and to prevent isolation or segregation from the community..”. An assistant who helps a person with motor disability in mobility or personal care or daily life activities, or a sign language interpreter, are examples of personal assistance.

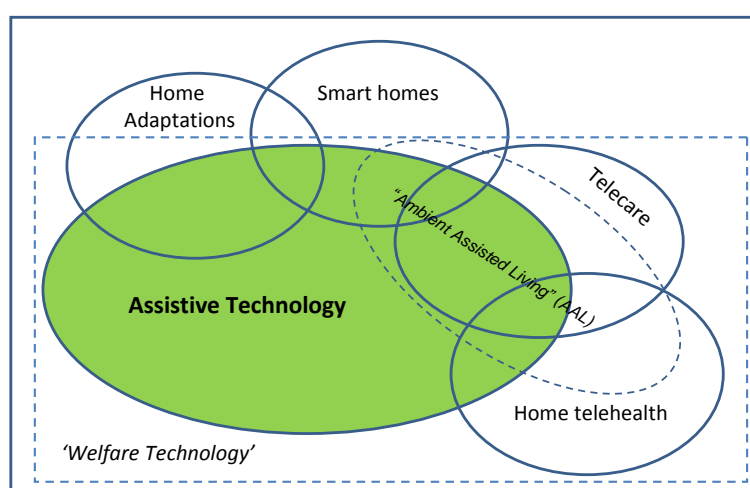
⁴ A previous AAATE position paper (2003) recommended the term “assistive solution” to indicate the whole set of human and technology supports needed by an individual to compensate for disablement and participate in society on equal foot.

This does not mean that there should be one single system for any kind of assistive solution: indeed, there may be local historical, cultural or legislation-related circumstances that impose the parallel existence of different systems, while good coordination is always possible if appropriate organisational measures are in place. What's important – for the purpose of this document – is to have a common understanding of which interventions should be considered today **assistive solutions**, and as such deserving the attention required by the UN Convention.

Other related terms

Before proceeding, it is worth noticing that in different professional environments new terms have recently appeared to describe certain technology applications that may be useful to people with disabilities and elderly people in their daily life, education, work or leisure. For instance, the term **Ambient Assisted Living** – although being an umbrella term that indicates the use of information and communication technologies to augment the life environment and make it “smarter” (more adaptable, adaptive etc.) for anybody – can be often encountered today in policy documents related to disability and ageing. Indeed, there are several examples of public “ambient assisted living” funding schemes aimed at helping people with disabilities or elderly people to take advantage of ICT to improve their home for better health control, safety, security and independence. Other terms, such as **care technology** (or **telecare** if operated at a distance), **person centred technology**, **welfare technology**, **gerontechnology**, **educational technology**, **daily life equipment** – just to mention a few in English language, leaving out the wealth of related terms in national languages whose shades of meaning may be not exactly the same as the corresponding English term – can be also encountered here or there in policy documents related to disability and ageing, depending on the professional or organisational context, or on the perspective from which technology is looked at.

Defining the exact meaning of any possible related terms falls outside the purpose of this position paper. Here we wish to just point out the existence of terminological debates, and make the reader aware that this jungle of terms (Picture 1) – each supported by a rationale, each having scientific legitimation, each indicating conceptual sets that intersect but do not coincide with each other – may make it difficult to agree on which terms should be used to best define the scope of a Service Delivery system.



Picture 1 – Assistive Technology and “neighbour” terms

Assistive Solutions as environmental facilitators

Luckily, the ICF model of the World Health Organisation helps clarify the concept. Within the ICF Model, **assistive technologies** in broad sense – including both assistive technology products in strict sense and mainstream products that can be used, assembled or configured to compensate for functional limitation or support participation in life activities – are classified as environmental contextual factors⁵. Individual **adaptations of the physical (or virtual) environment** where the person lives or carries out certain activities are also considered environmental contextual factors, although classified under a different class⁶. The same applies for **personal assistance**, which is mentioned under another different class⁷.

This concept can be summarised by the “four A equation”:

$$\begin{aligned} & \text{Assistive technologies +} \\ & \text{personal Assistance +} \\ & \text{individual environmental Adaptations =} \\ & \text{-----} \\ & \text{Assistive solution} \end{aligned}$$

Each factor may work as **facilitator** or **barrier**, depending on how well it is implemented and how well it works in combination with the other two factors. Working as **facilitator** means supporting the person’s **autonomy**, i.e. improving participation in life activities in relation to his/her personal hierarchy of needs⁸. In other words, an assistive solution can be judged as **effective** if there is evidence that it has improved **autonomy**, or made it possible to maintain it.

Indeed, whether the person wishes to lead an independent life, or live in a sheltered setting, or stay with his/her family, or establish his/her own family, **autonomy** is a prerequisite for free life choices (provided that society is organised in such a way to guarantee the individual right to choose and make all options possible)⁹. Autonomy – intended as ability to take control over one’s own life, to establish relationships with others and actively participate in society¹⁰ – is a broad concept: thinking that it depends only on technological enablers or personal assistance or enabling environments would be reductionist. Indeed, autonomy is the outcome of an **empowerment** process involving a personal growth, to which several other contextual factors contribute (medical care, rehabilitation, education, counselling, housing, social measures etc., all being environmental contextual factors in the ICF model). However, it is evident that achieving autonomy is often impossible without appropriate assistive solutions.

The discussion so far clarifies the **scope** of an AT Service Delivery System: **ensuring that all people with disabilities can access appropriate assistive solutions that are able to support autonomy in their life environment.**

⁵ ICF class e1 “products and technology”

⁶ ICF class e2 “natural environment and human-made changes to the environment”

⁷ ICF class e3 “support and relationship”

⁸ In general, people tend to consider as first priority the needs related to health support, then to safety and security, then to independence or freedom of choice in daily life tasks, than to relationships, eventually to leisure; however, as a matter of fact, the detailed hierarchy is different for each individual.

⁹ The concept of autonomy does not apply exclusively to the individual: in certain cases a systemic approach is needed that looks at the whole person’s family for instance by providing assistive solutions tailored to family members’ needs to make the burden of assistance sustainable.

¹⁰ Definition provided by the EUSTAT Study (Empowering Users through Assistive Technology) of the European Commission (1999)

Accessibility: the other side of the coin

Assistive solutions are individualised interventions. As said above, building up an assistive solution may often involve an individually-tailored combination of purposely designed assistive technology products, a personal assistance setup, adaptations of the living environment and the use of some mainstream products or services.

Conversely, if we look from a societal viewpoint at the accessibility of mainstream environments, products and services – which means having in mind not a specific individual user but the whole population that may need to use them – we go to the other side of the coin.

While the terms discussed in the previous chapters refer to "design-for-need" i.e. technology designed or adapted for the individual, terms such as **accessibility** (or **e-accessibility** if referred to the ICT environment), **design-for-all** or **universal design** are used to indicate environments, products and services designed for the general public with also a view at the functional/ergonomic requirements of the disabled or elderly population (more in general, of those who have a permanent or temporary functional limitation), or at the compatibility with the assistive technologies this people may use. There is an ongoing lively debate on these issues, that continuously enriches the perspective and brings new interesting points to the fore. For instance, some authors suggest that some of these concepts fall within broader concepts such as **ergonomics** or **usability**; some others highlight the need to look into **cognitive accessibility** (readability of websites, clear signposting in buildings, etc.).

The point we wish to clarify in this position paper is that **accessibility** is an **infrastructural** intervention: it means ensuring that the mainstream environment – as well as mainstream products and services – is usable by all people, including those with reduced function or who depend on assistive technology. Ensuring accessibility involves all sectorial responsibilities in society (for instance, tourism accessibility should be responsibility of the tourism sector; accessibility of worksites, of the employment sector; accessibility of schools, of the education sector; accessibility to information, of any information provider; etc.). Ensuring **infrastructural accessibility is not responsibility of an AT service delivery system**.

However, there is a relationship between infrastructural accessibility and individual assistive solutions. In general, the effects of both interventions add up. When infrastructural accessibility is poor, the individual assistive solution could compensate for this, and vice versa (Picture 2). However, the more inaccessible the mainstream environment is, the more difficult it will be to implement effective assistive solutions. Indeed, even the best or the most expensive assistive solution cannot work well in an inaccessible environment.



Picture 2- Add-up effect of infrastructural accessibility and assistive solutions

This means that **accessibility policies** and **AT service delivery policies** should be **well coordinated** among each other. According to the UN Convention, both are related to the fulfilment of the same human right.

Basic features of an AT Service Delivery System

Why are public service delivery systems needed for assistive technology

AT is most often provided to individuals through health and social care practitioners, but is also increasingly available for direct purchase by consumers. Today some common devices – think e.g. commode chairs or simple daily life equipment, but sometimes also sophisticated devices such as powered scooters or environmental control systems – can often be found in high street shops or purchased online. Application software able to make a computer (or a tablet, a smart phone etc.) accessible, or to transform it into a communication device, can be often downloaded from the “Internet cloud”, at prices much cheaper than in the past, or even free-of-charge and sometimes along with their open source code. What’s more, the availability of mainstream goods that are accessible or usable by people with disabilities is also increasing; this trend is expected to continue in the future, due to increased public awareness and to accessibility regulations. Indeed, the assistive technology world is dramatically evolving, with new products appearing on the market everyday at increasing pace, at either high or low cost depending on market dynamics and on the existence of intermediaries (insurance companies, national/regional service delivery systems..).

Most service delivery systems are not flexible enough to follow the pace of these advancements and take advantage of state-of-the art technology for the best benefit of their citizens, so as to increase service effectiveness and efficiency. What’s more, they have to cope with a general trend of reduction of resources. Need for improvement is perceived everywhere in Europe. This document provides some hints.

Question 1: Are assistive technology products going to disappear in the future, due to the embodiment of accessibility features in mainstream products ?

No. It is true that there is a general trend towards a more inclusive society, where the living environment and mainstream products and services will include more features and capabilities that make them usable by a larger percentage of people with functional limitations. This trend can be observed in particular in ICT products (*information and communication technologies*), that are increasingly becoming more adaptable (configurable in such a way to tailor to individual user requirement), sometimes even adaptive (automatically adapting to the user’s preferences), and based on more flexible architectures (mobile and ubiquitous computing, with applications that can be downloaded from the “cloud”).

However, the ideal age in which the whole mainstream environment and all products and services will be so smart to cater for each individual need cannot be seen on the horizon yet. There is no evidence that this will ever happen. Even the ICT realm, that theoretically has the highest potential to generate accessible mainstream products and services, introduces every day new barriers related to increased complexity, new interaction paradigms, new lifestyles which people have to adapt to sooner or later. In some way, everyday the ICT world is even creating new barriers or accessibility challenges that were unknown before.

A gap between functional limitations and usability of mainstream products – even if embodying the most advanced **design-for-all** features – will forever exist for a certain percentage of population: the gap can be compensated only by means of specific **design-for-need** (i.e. assistive) technology. As far as mainstream products become more and more inclusive, this percentage may theoretically decrease within the disabled population; however, at the same time, the percentage of disabled

people is due to increase as a consequence of increasing ageing of the overall population. In any case, while part of the population with disabilities may get access to devices, functionalities and services through inclusive design, there will always be a remainder of this population who gets more and more distant from inclusion because of their smaller relative number.

Indeed, assistive technology is an alive and evolving industrial sector that deserves research, development and investment. What's more, knowledge in *design-for-need* and knowledge in *design-for-all* go hands in hands: it is worth mentioning, for instance, that today's definitions of accessibility include the "*compatibility of a mainstream environment or product or service with assistive technologies that may be used by individuals*". As a matter of fact, little advancement in inclusive design can be expected if knowledge on assistive technology is not promoted and supported.

Question 2: Why shouldn't assistive technology products be dealt with as common consumer goods, purchased directly by users without the intermediation of service delivery systems ?

In most countries two contrasting trends can be seen: on the one hand, there is a growing need for AT and at the same time it is often hard for many people to obtain appropriate and good AT solutions. Indeed, there are at least **four reasons** why intermediaries are needed: an **ethical**, a **financial**, an **expertise** and a **consistency** reason.

The **ethical** issue is related to the principle of equal opportunities, that should be ensured to all citizens regardless of their capabilities. This principle yields substantial juridical relevance in countries that have signed the UN Convention on the Rights of Persons with Disability. Measures ensuring access to AT should be taken as a societal responsibility, as ATs are often a prerequisite to ensure equal opportunities to citizens with disabilities and elderly people.

The **financial** issue is related to the need to remove cost barriers so as to give equal opportunities of access to assistive technology to all people who need them. Without a service delivery system, a significant number of AT products would fall outside the financial capability of most users. Indeed, removing financial barriers for those who couldn't afford them is a way to ensure the above-mentioned individual right to assistive technology stated by the UN Convention.

The **expertise** issue is related to the need for qualified professional support when selecting and implementing (configuring, fitting, learning to use etc.) an assistive solution. Setting up an individual assistive solution often involves highly specialised competences and expertise, and in some cases a team approach with the contribution of various disciplines and active participation of the user and other stakeholders (family, primary caregivers, employers, teachers etc..). If this process lacks competences and is not well-driven, it may result in abandonment of the devices, waste of resources, unchanged situation in the person's disability, and frustration for the users.

The **consistency** issue is related to the need to ensure that assistive technology interventions fit into the overall individual intervention packages. As a general rule, the implementation of environmental facilitators should be looked at as a specific intervention programme within a wider individual life project, which may be related, depending on individual circumstances and timing, to objectives such as rehabilitation, assistance, independent living, educational, employment etc. Only in some cases it can be "atomic", as a response to a specific need that arises in the course of life without requiring a revision of an ongoing life project, or the formulation of a new one.

Service delivery models

AT Service delivery systems are part of the local welfare system, thus the way in which they are organised greatly differs in the various Countries or Regions of Europe depending on welfare legislation, on local history and culture. Indeed, setting up a single European service delivery system

would be unrealistic. As a consequence, comparison among the various systems at detailed level may be difficult. However, some comparison can be attempted at the level of policy principles.

Question 3: are there different approaches for AT service delivery?

The provision of an assistive solution to an individual user has little in common with the prescription of a drug or a medical procedure. An assistive solution is not intended to cure or control a disease: it just compensates or substitutes for functional limitations in order to allow a more independent life. That's why the selection of an assistive solution should be based on a **partnership approach** (team work, in which the user plays a key role) rather than on a **directive approach** (in which the professional selects and the user has little or no say). Both effectiveness and ethical¹¹ considerations suggest that the partnership approach should drive the attitude and the working methods of the involved professionals.

From the organisational viewpoint, we can identify three main models (although well-defined boundaries among them are just theoretical): the so-called "medical model", the "social model" and the "consumer model".

Within the **medical model** each AT device eligible for public provision should be prescribed by a qualified professional under his/her responsibility. The model is called "medical" due to its similarity to drugs prescription in medical practice¹², although not in all Countries the authorised prescribers are always physicians (depending on the type of equipment, they may be other health professionals, such as occupational therapists, physiotherapists, nurses etc.). A medical model is usually regulated by a list of products (Registry) or product specifications (Types of products) eligible for public provision, with or without established prices or reimbursement thresholds.

Within the **social model**, the focus is on the whole assistive solution, rather than on specific devices. Once the individual assistive solution has been decided and the budget has been authorised, the choice of the specific devices is quite free, provided that they effectively meet the intended goals. Within a social model, basically any device may be eligible for public provision, unless public procurement policies restrict the range to products meeting a certain price or safety or quality rules.

Within a **consumer model**, the user decides on the devices and purchases them directly. This does not mean that users have to pay everything out of their pockets (the system may provide financial help through vouchers or cash) nor that they can purchase whatever they wish (financial help is provided against authorised objectives on which the user should be accountable) or that they are left alone in their choices (information and professional support services play a fundamental role in consumer models; empowering the user to be capable of responsible choices is also an important issue that should be addressed in consumer models).

Question 4: When can a medical model, or a social model, or a consumer model be considered appropriate?

There is not a fixed recipe to decide whether a medical or a social or a consumer model is the most appropriate in given circumstances. It may depend on the context (daily life, employment, education, leisure etc.), on the technology domain (prosthetic/orthotics, daily life equipment, home appliances etc.), on the professional expertise available, on higher-level national regulations in the health, social,

¹¹ The so-called "Madrid declaration" (2003) of the European Disability Forum clearly indicates the general principle that should also guide professional interventions related to disability "Nothing about us without us".

¹² "Medical model" is not synonym of "medical approach": it just indicates an organizational model in which eligibility for reimbursement is decided for each specific device. It is true that professional holds the final decision, however in good practice the selection of the device should be driven by a "partnership approach" even in medical models.

educational or employment sector. Economic considerations should be also taken into account, as medical models may be in principle more expensive than social or consumer models, due to the more complex processes involved at individual level, and the complex regulatory apparatus involved at central level.

Tentatively, one could say that **medical models** are appropriate for health-oriented equipment (supporting life functions such as e.g. respiratory devices, or preventing clinical risks such as anti-decubitus cushions) or function-oriented equipment (prosthetics, orthotics, footwear, personalised seating systems, hearing aids etc.): in other words, for equipment whose choice and personalisation require thorough clinical assessment, and whenever wrong choices expose the user to significant clinical risk. Conversely, one could say that **social models** are appropriate for participation-oriented equipment (daily living tools, mobility devices, communication devices, home adaptations, ambient assisted living appliances etc.) where the clinical risk related to wrong choices is less critical; where the range of equipment that can be considered for the choice is broad and varied (so there are different alternative ways to build up the assistive solution); and where installation/configuration require technical rather than clinical competencies.

Consumer models could be considered as derived from social models but with more responsibility and decision power shifted to the user. The main advantages of consumer models are that they put the market supply in direct contact with the consumer demand, which is a powerful drive for quality improvement and price reduction; however service delivery systems based on a consumer model can only work if users are empowered to make informed and responsible choices, and to be accountable against the intended objectives. This can be done by providing the user with effective information; by making available assistive technology information centres where users can learn about assistive technology in an environment independent of commercial interest; by developing a partnership attitude among rehabilitation professionals; by including empowerment among the expected outcomes of a rehabilitation, or care, or educational plan; and by enforcing measures to prevent or detect possible non-use or abandonment of the purchased devices.

Process and quality indicators in AT service delivery systems

In order to attempt comparisons among the various AT service delivery systems and formulate suggestions for their improvement, a common way to describe the service delivery process and measure its quality should be found. Luckily, the method identified by the already mentioned HEART study is still valid today, and provides answers to the following questions.

Question 5: Independently of the model and the Country or Region, is it possible to identify common steps in the service delivery process ?

Yes. The HEART Study identified the following seven steps in any service delivery process. Their original wording has been slightly changed, based on the definitions provided in the previous chapter, although the conceptual meaning is still the same:

- **Initiative** (the first contact with the service delivery system)
- **Assessment** (evaluation of needs)
- **Selection of the assistive solution** (defining the individual AT programme)
- **Selection of the equipment** (choosing the specific equipment within the AT programme)
- **Authorisation** (obtaining funding)
- **Implementation** (delivering the equipment to the user, fitting and training)
- **Management and Follow up** (maintenance and periodic verification)

The way this is organised in practice depends on the Country/Regions, on the funding schemes, on higher-level health or social or education or employment policies. Not all these steps are present in all service delivery systems; conversely, there is no other additional step not corresponding to one of the above seven steps.

Question 6: How does each step influence the costs and the outcomes of the whole process ?

Each **step** generates **costs** – either for user and for the system – and produces an **output**. The whole **process** produces an **outcome**. In order for the whole process to be effective, each step should be **efficient**. Inefficiency at any step generates lacking outputs, which in turn may impact on the subsequent steps and risk to invalidate the overall outcome.

Inefficiencies also generate additional human and financial costs, for either the systems or the user. For instance, unreasonable **waiting times** in having the equipment authorised may cause prolonged stays in hospital (in case the user cannot move to home without such equipment) or delays in a child's educational experience (in case the user cannot fully participate in school activities without such equipment, with the risk of missing key educational goals and losing pace with the companions).

In given contexts, there may be **unnecessary steps** which could be even removed, thus saving costs and time: the **authorisation** – for instance – would be needless in case those who are responsible for the **selection** are also in the position to verify eligibility.

Costs should be measured in terms of **social costs** (the sum of all costs – in terms of money, time, resources etc.. - borne by all actors involved), which in turn include both the cost of the solution (equipment, maintenance, assistance etc.) and the cost of the service delivery process.

Outcomes should be measured in terms of both **effectiveness** (how far the intervention did meet the intended objectives) and **usefulness** (how far it was perceived by the user as improving or helping maintain the quality of life).

Question 7: How can the process be monitored by quality indicators ?

The quality of the service delivery process is vital for the success of the intervention. The HEART Study identified six quality indicators that can be considered still valid today. Indeed, a recent survey among experts in Europe indicated that these criteria are still relevant for the present situation. The six criteria are: **accessibility, competence, coordination, efficiency, flexibility, user influence**.

Accessibility: a service delivery system is accessible when no one is excluded from the services or in any other way discriminated. It is essential that the system is driven by the user needs and that funds are available to remove financial barriers that may hinder access to assistive technology. It is important that people know that there is a service delivery system, that assistive technology products exist, and where to go to make the first contact in order to access the system. Once the contact is established, it should be easy to get appropriate assistive solutions without unnecessary delay. Accessibility indicators include the scope of the system (beneficiaries, age differences, insurance differences etc.), its simplicity, the availability of information to the public, financial barriers and costs for the user, the duration of the process and the complexity of the procedures.

Competence: a service delivery system is competent if the involved professionals have the knowledge and the skills needed to properly meet the user needs. Competence indicates the availability of knowledge, skills and experience necessary to serve the client. Competence indicators include the educational level of the professionals involved, the possibilities for further education, the use of protocols and standards in the process, the availability of information about assistive technology, the possibility to learn from users' feedback.

Coordination: a service delivery system needs to be well-coordinated at three levels: within the primary process of service delivery (everything "around" the individual user or client: **micro level**), during the various steps of the service delivery system process (all professionals working

harmoniously together: **meso level**), and within other policies and processes (research and development, market processes etc.) involving assistive technology (**macro level**).

Efficiency: a service delivery system is efficient when it is able to achieve the best solution for the highest number of users, using the available resources in the shortest time and at the lowest cost. An efficient system involves low costs for the users, their direct involvement in all procedures, simple bureaucracy, accessibility to information, completeness of service. Efficiency indicators include complexity of procedures and regulations, duration of the process, control of the system over the process, mechanisms able to control costs and effectiveness, allocation of decision-making power to the appropriate level of competence between the various actors involved.

Flexibility: a service delivery system is flexible when it is able to respond to the different needs of individuals; when a producer/importer can get a device tested at a reasonable cost and within reasonable time, and get into the market; when researchers and developers can get support for their work, coordinate their work, cooperate and communicate with users, designers, producers, and utilize new technology to meet needs.

User influence: a service delivery system takes advantage of the user influence when it empowers, actively involves and makes the user participate in responsibilities in all decisional processes related to assistive technology interventions. The lack of user involvement exposes the process to the risk of wrong or ineffective intervention, abandonment of the devices provided and waste of resources. User influence indicators include the presence and strength of user organisations, the availability of juridical protection of the user's rights, the involvement of users at a policy level, the user empowerment during the individual assessment, communication with the user in the service delivery process and the influence of the user on decisions in the process.

Question 8: How can information support the service delivery process ?

The availability of *super-partes* (i.e. independent on commercial interest) information on assistive technology products and related issues (companies producing/supplying them or providing services; professional services for the assessment or choice or training; literature on assistive technology; use experiences by users or professionals; hints on how to solve given problem by means of assistive solutions; etc.) is a key factor for the effectiveness of a service delivery system. It contributes to the empowerment of **people with disabilities** and their families, by disseminating awareness, increasing knowledge, helping clarify needs and assisting decisions. It is required by **care professionals** when helping users choose AT products that fit their needs, when training users in their usage, when designing rehabilitation, education or social participation programmes. It is vital for AT **suppliers and manufacturers** to better know the market, discover opportunities, find out ideas for development, make their products known to the potential customers. It is important for **policy makers** and **officers** involved in public service delivery systems (insurances, Health Authorities etc.) to efficiently allocate resources in AT provision. **Researchers and developers** also need access to information that helps know what already exists, which users' needs are still unmet, what AT areas are admitting of significant developments.

At the time of the HEART study the European Commission was attempting to initiate a EU-wide information system on assistive technology – the HANDYNET database – that was released in various Cd-Rom editions since 1993 to 1997. Although it was unable to take wing as a self-supported information system – and the project was criticized because of the huge financial investment involved – it gave birth to a common thinking that later inspired most national systems, both those that were in existence at that time and those that were established later.

Now well-established *super-partes* national information systems are publicly available on the Internet in many Countries, such as **Italy** (Portale SIVA: www.portale.siva.it, in Italian and English), **Germany** (Rehadat: www.rehadat.de, in German and English), **Belgium** (Vlibank: www.vlibank.be, in Flemish), **Denmark** (Hjælpe-middelbasen: www.hmi-basen.dk, in Danish and English), **United Kingdom** (DLF-data: www.dlf.org.uk, in English, and its related search tools LivingMadeEasy

www.livingmadeeasy.org.uk and AskSara www.asksara.org.uk), **Spain** (Catàlogo de Ayudas Técnicas: www.catalogo-ceapat.org, in Spanish), **France** (Handicat: www.handicat.com, in French and English), **The Netherlands** (Vilans Hulpmiddelenwijzer: www.vindeenhulpmiddel.nl, in Dutch).

Today all these systems collaborate with each other in the **EASTIN Association** (European Assistive Technology Information Network). They make available their data to the **EASTIN search engine** (www.eastin.eu), by which citizens from any EU Country can search information on assistive technology products and related resources contained in all such systems, and get it in their language. Today the EASTIN system has become the European landmark for assistive technology information, and will gradually increase its coverage by aggregating further resources mobilised by other EU-supported networks (ETNA, ATIS4All etc.).

There other nation-wide information systems that deserve mention, although not connected to the EASTIN network, such as AssistIreland (www.assistiveireland.ie) in **Ireland** (operated by a governmental agency), or Handy Wijzer (www.handy-wijzer.nl) in **The Netherlands** (operated by a company on subscription basis).

Overall, we can say that getting information on assistive technology is no longer a problem, as far users and all the other actors involved in the service delivery process know about the existence of these information systems. We can also say that the previous Handynet heritage is certainly one of the factors that made it possible – years later – to eventually achieve the EASTIN.

Recommendations

Recommendations for improvement at national or local level

The following list of recommendations initially stems from the HEART Study (1994). It has been enriched with contributions gathered in the 2012 Copenhagen workshop and in subsequent e-mail discussions. It is not intended as a systematic guideline for the design of Service Delivery Systems but rather as a collection of “tokens of wisdom” that can help improvement.

The recommendations are organised according to the six HEART quality indicators, plus the overall recommendations. For each indicator, the left column lists the original HEART recommendation while the right column indicates which recommendations are still valid today, reformulates the recommendations that need adaptation to today’s context, and lists the further recommendations that have been raised later.

Overall

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	-	In working at the improvement of national AT service delivery systems, one should avoid: 1) Unrealistic attempts to make a single EU system; 2) Making the system too dependent on upper-level political changes; 3) Implementing changes that are not adequately supported by knowledge and evidence; 4) Reverse back to strict medical approach; 5) Leave the user out of the process; 6) Increase the gap between those who can afford AT and those who cannot.

Accessibility

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	Access to the service delivery system and the provision of technical aids should be based on individual needs resulting from disability and independent of the kind of disability, age, etc.	Still valid
2	One "door to knock" should be sufficient to gain access to the system and start the procedure.	Still valid
3	General information on where to turn and detailed information on specific systems and services should be available and accessible to all potential users.	General information on where to turn and detailed information on procedures should be available and accessible to all potential users (including end users, their family or carers, professionals etc.), by means of user- friendly material (brochures, pamphlets, websites, apps etc.)
4	The process of obtaining assistive technology has to be clear and understandable to the user.	Still valid
5	In order to improve accessibility, information and resource centres should be set up and supported.	Still valid
6	Information services should be located in relevant places close to the citizens (in all geographic areas, in relevant	Still valid

	public places, homes, etc), in order to increase availability.	
7	Limits on waiting times should be introduced on administrative and financial aspects of the process. Limited waiting times should however not hinder the quality of the service.	Still valid
8	The user should have the right to appeal.	Still valid
9	There should be no financial hinders for those who need a technical aid.	Still valid

Competence

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	Centres of excellence, e.g. specialised in disability groups or specific aspects of technology, should cooperate in order to increase competence and disseminate information on international basis.	Still valid
2	Education about assistive technology should be included in the basic education of the professionals involved in service delivery.	Still valid
3	Continuing training is necessary for all the professionals involved.	Still valid
4	In the education and training of the professionals there should be user involvement.	Still valid
5	Prescription of technical aids should not be based upon a medical model. In the selection process medical, functional, social and other aspects should be taken into account. According to this, the multi disciplinary team approach is the most appropriate.	Selection of assistive equipment should not be based upon a strict medical approach. In the selection process medical, functional, social and other aspects should be taken into account. According to this, a partnership approach and multi disciplinary assessment are the most appropriate.
6	The information provision infrastructure must be a substantial part of the service delivery system and provide information to all the actors involved in the processes of service delivery. The provided information should be independent from the system and from commercial influences.	Still valid
7	Umbrella organisations and special interest groups should organise information exchange between companies and professionals and users.	Still valid
8	Good protocols of the process of service delivery can guarantee the fulfilment of quality standards and meeting requirements in service delivery. Good protocols are linked to the process and not to the professions involved. Good protocols must be: public, usable for the education of professionals, help the professionals and give the users the opportunity to know what they can expect from the professional involved.	Good protocols of the process of service delivery can guarantee the fulfilment of quality standards and meeting requirements in service delivery. Good protocols are linked to the process and not to the professions involved; they must be: public, usable for the education of professionals, help the professionals and give the users the opportunity to know what they can expect from the professional involved. Good protocols are just as relevant to commercial retailers/suppliers as service providers; these may include national codes of practice safeguarding and promoting the interests of consumers that retailers sign up to. These codes of practice may, for example include commitments not to use high-pressure selling techniques and for staff to have completed specific training.
9	The user should be educated to be a partner in the	Still valid

	process, by the provision of independent and objective information and advice.	
10	A multi disciplinary approach is the most appropriate in the design of research and development programmes in this field. Special attention is necessary for transferring the outcome of research and development to all actors involved in service delivery.	Still valid
11		Services related to assistive technology should be designed on the basis of scientific evidence
12		ICT tools should be developed to assist the individual assistive technology assessment process.
13		There is the need for new specialised professionals in certain areas of assistive technology (e.g. ICT based AT): the labour market is asking for them, so there should be educational opportunities.
14		There is the need for independent AT assessment Centres to address more complex needs. Especially in decentralised system, specialised knowledge may not be present everywhere it is needed: centralised knowledge would be useful to prevent fragmentation. A Service Delivery System should take advantage of the knowledge available in these AT Centres also to support System innovation and changes, also by means of ICT-based tools and services
15		People involved in AT service delivery have different backgrounds: they often need to develop specialised AT skills. For this reason, training and education should be provided at various levels (from “AT for dummies” to postgraduate qualification). AT skills should also include the awareness of one’s own knowledge limitation, the ability to ask for advice when needed, the understanding that AT does not solve all problems, the need to prevent damages (e.g. frustration) caused by improper use of AT.
16		Professionals in AT service delivery should be aware of ethical principles underlying AT service delivery and should be able to work accordingly.
17		AT training should be provided to people with disabilities; the participation of people with disabilities that wish to undertake a career in AT in existing AT courses should be furthered.

Coordination

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	A guiding person should be available to coordinate the service delivery process for the user.	A knowledgeable guiding person should be available to coordinate the service delivery process for the user.
2	There should be established procedures that are clear and well known, used in a non-mandatory way and evaluated regularly.	There should be established procedures that are common throughout the whole Country, clear and well known, used in a non-mandatory way and evaluated regularly.
3	The role of professionals should be transparent; responsibilities should be clearly demarcated.	Still valid
4	A service delivery system should be self-correcting: an appeal system, ombudsmen, and/or similar institutes are substantial tools for self-correction.	A service delivery system should be self-correcting: an appeal system, ombudsmen, and/or similar institutes are substantial tools for self-correction. This may also

		include national codes of practice for retailers/suppliers safeguarding and promoting the interests of consumers that retailers can sign up to. These codes of practice may, for example, include commitments to protect pre-payments or deposits paid by consumers in case the supplier goes bankrupt, cancellation rights and a standardised appeal and complaint system.
5	There should be a national independent structure for the coordination of research and development of assistive technology and service delivery.	Still valid
6	There should be a national policy (legislation) to ensure the rights of the disabled and to ensure coordination within the Service Delivery System.	Still valid
7	There should be an interdepartmental body at the highest appropriate government level with full responsibility to implement the policy.	Still valid
8		The individual AT programme should be consistent with the overall individual life plan (rehabilitation, educational, care etc.).
9		A national system to notify both professionals and users of product recalls or alerts should be operated. Where possible, this may be incorporated into national AT databases to maximise exposure. The issuing of an alert, warning or recommendation under this system should be encouraged as a responsible action and not viewed as an indication of failure or poor practice.
10		Service delivery systems should be able to provide a holistic overview of problems and possible solutions. Therefore services should coordinate and be able to refer their clients to other services for those areas of need that they cannot respond to.

Efficiency

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	A first assessment of needs is required in as early a stage of the process as possible. This assessment includes identification of problems and solutions, and information to the user in order to enable him/her to decide if he/she wants to initiate the process (e.g. possible solutions, procedures, costs).	Still valid
2	The system should enable the users themselves to make responsible choices.	Still valid
3	There is a need for individual follow-up after the provision of a an AT product.	Still valid
4	Lists of technical aids and protocols are useful for guiding professionals and users within the system, but the individual solution cannot be standardised: it must be related to individual needs.	Pre-established lists of assistive products and protocols are useful for guiding professionals and users within the system, but the individual solution cannot be standardised: it must be related to individual needs. Free choice of alternative solutions that meet the individuals needs is an interesting perspective that should be aimed at.
5	Service delivery systems should include systems or procedures for self-correcting quality control of the process and the outcome.	Service delivery systems should include quality assurance procedures for self-correcting quality control of the process, of the devices provided and the outcome. The outcome results from the combined effect of the

		effectiveness of AT device and the effectiveness of the process. Process indicators should include – inter alia – waiting times. Outcome indicators should be linked to the ICF model (eg. measuring achievement of activity/participation objectives) and measure both effectiveness (achievement of pre-established objectives) and usefulness/satisfaction (user perception of the achieved objectives), by means of appropriate instruments. ¹³ An AT service delivery process can be considered concluded only when there is evidence of a satisfactory match between the person and the provided solution.
6	An efficient system has to have clear goals, methods for evaluation, adequate data and feedback from all actors of the system.	Still valid
7	Close cooperation between all the different actors is necessary for an efficient system.	Still valid
8	A system is efficient when the user can access by "knocking on one door", without long waiting lists.	Still valid
9		Service delivery systems should be designed in such a way to maximise the individual outcome and minimise costs. Cost analysis mechanisms should be implemented to monitor either the cost of the process or the social cost of the assistive solution provided. However, the decision on the individual solution should be driven by effectiveness, not by cost: cost analysis is instrumental to resources allocation, not to individual decision. Only in case of different assistive solutions having the same effectiveness, cost can be used as a decision criterion to maximize efficiency.
10		Recycling of assistive devices (measured as % of total number of provided devices); Framework contracts; Lean methods (to optimize the service delivery process)
11		Service delivery system should ensure efficient maintenance services and procedure for the whole lifecycle of the assistive equipment provided.

Flexibility

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	Every service delivery system needs some system of quality assurance. This is even more urgent when flexibility increases (e.g. through decentralisation).	Still valid
2	A good service delivery system involves the use of a multi-disciplinary rehabilitation plan, tailored to the needs of the individual.	Still valid
3	A common approach to testing would facilitate entrance of products on national markets and thus improve flexibility of the service delivery system.	Still valid
4		Flexibility improves if the budgets are established on the basis of needs rather than on the basis of AT categories;

¹³ Examples of recently-developed instruments that have proved useful are: Quest 2.0 (satisfaction, non-device-specific), Nomo 1.0 (effectiveness, non-device-specific), FABS/M (effectiveness, device-specific), IPPA (usefulness, non-device-specific)

		needs are relatively stable while AT products rapidly evolve.
5		Good AT public procurement policies can help optimize cost while increasing effectiveness. However, they should be flexible enough to support industrial innovation.
6		Policy makers should be very open, as assistive technology is quite a complex area, where no single method exists that solves all problems, and scientific evidence is still weak on many issues, due to the lack of scientific research so far.

User influence

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	The user is the best judge of whether a specific technical solution to a functional limitation is good.	The user is the best judge of whether a specific technical solution to a functional limitation is good. The individual AT programme should be built in relation to what life goals the user wants to achieve.
2	A good service delivery process is designed in a way that empowers users to make their own choices. This can be done by: a) educating professionals to have an attitude of equity towards users; b) providing information and consultation to enable users to make responsible choices; c) allowing users to try out products for a reasonable time before making the final choice; d) providing the possibility, to both users and professionals, to change decisions that have been made.	Still valid
3	The rights of disabled persons to appropriate assistive technology should be ensured by: a) adequate legislation; b) accompanying financial means; c) platforms (e.g. advisory committees) at local, national and/or European level promoting and monitoring regulations and practices; d) statutory bodies to ensure and protect the rights of individuals (right to appeal).	Still valid
4	User influence could be facilitated by providing financial resources at two levels: a) providing individual users with their own budget to use towards services and devices; b) providing user organisations with financial support which may be earmarked for specific uses or open for whatever the organisation sees as most important.	Still valid
5	The search for good technical solutions to the limitations of disabled persons can be facilitated by the involvement of disabled persons.	Still valid
6	In a good service delivery system, user influence in research and development is organised on three levels: a) mechanisms to systematically collect individual user feedback, e.g. through panels of expert users; b) user involvement in specific projects; c) user involvement in defining priorities in Research and Development programs.	Still valid
7	In designing a service delivery system the general level of education of the population, as well as the educational opportunities available to people with disabilities, have to be taken into account.	Still valid

8		Effective systems – based on state-of-the-art ICT but also including structured ways to meet face-to-face – should be designed to connect developers and users, in such a way to facilitate innovation based on real user needs captured in the field. Innovators should find out where the need is.
9		Access to AT information by user is extremely important to empower users to make informed choices. Sophisticated systems (semantic search, natural language processing etc.) should be implemented to improve user-friendliness of the search interfaces of the AT information system ¹⁴ .
10		A service delivery system should be able to provide appropriate services tailored to different needs; according to the level of complexity of the problem of the user; to the level of knowledge, awareness and decision making ability of the user; to the expected level of complexity of the solution;
11		Professionals in AT service delivery should adopt flexible approaches to best cope with the competence of each individual end users: for instance, costly evaluations should be avoided for simple needs expressed by users who have already clear ideas of possible solutions.
12		In the various steps of the service delivery process, users should be empowered and receive all information needed to make informed choices. In particular, within the rehabilitation process, professionals should work at empowering the user to become a specialist him/herself of his/her needs; professionals should have the attitude to make themselves as much as possible “unnecessary”, although ready to offer again high level expertise at any time it is needed.
13		Peer counselling (by persons who have longer experience of living with a disability) could be a powerful resource in the “selection” step, to improve effectiveness of the service delivery process.
14		Individual AT programmes should be part of a wider life plan (rehabilitation, care, education, employment etc.). They shouldn’t be a goal in itself. For this reason, the user should be given an active role in the whole process. For instance, professional assessment reports might be integrated by self assessment reports, in order to better take into account environmental factors and personal goals.
15		People with disabilities and their representing organisations should participate or be invited to participate in any decisional process or governing bodies in Assistive Technology.

¹⁴ Several information system have developed guided search tools for users (e.g. AskSara www.asksara.org.uk or Realise www.realisepotential.org). Recently, also EASTIN has implemented for some languages a Query Processing component based on natural language Query and semantic search.

Suggestions for actions at EU level that could support improvement

This section lists some suggestions for action at EU levels that could support improvement in the national service delivery system. The list is organised in the same way as the previous chapter.

Overall

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	European collaborative research projects should be initiated for developing methodologies and procedures to be embedded in the SDSs for systematic collecting and processing individual user feedback. Such projects should include pilots and test-beds of good practice.	Still valid
2	Development of measuring tools (to be embedded in the accounting systems of SDSs) for taking into account not only what that system is doing, but also why (as a key to build a self-regulating system).	still valid
3	HANDYNET should be part of a wider strategy (or structure) for transferring information and knowledge. That strategy should include also other channels, like awareness campaigns, other databases seminars, etc.. TIDE should take the responsibility to initiate such strategy.	The EASTIN and the national AT information systems should be looked at within a wider strategy for transferring information and knowledge to user and to all other actors involved in the service delivery process. That strategy should include also other channels, like international awareness campaigns in the media.
4	There should be European action networking information centres, technology transfer centres, market advisory centres in the field of AT, developing common protocols of information/technology transfer activities.	There should be European networking involving information centres, technology transfer centres, market advisory centres. International exchanges would be helpful to exploit international expertise, to share knowledge and good practices.
5	There should be European action to develop and validate protocols for selection/prescription process.	There should be European action to develop and validate common protocols for assessment/selection, as well as guidelines defining basic standards in service provision, and indicators of the situation in the various Countries
6	The Commission should continue stimulate and support projects within the whole range of assistive technology; moreover, disability issues should be taken into account in all other programmes supported and implemented by the Commission.	The Commission should continue stimulate and support projects within the whole range of assistive technology, not only in the ICT field; moreover, disability issues should be taken into account in all other programmes supported and implemented by the Commission.
7	A network of non-governmental organisations should be created at European level.	Still valid

Accessibility

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	A European structure is recommended for dissemination of information and knowledge exchange with respect to European research and development and good practices in service delivery.	Still valid
2	This structure should stimulate networking and exchange of experience and ideas between relevant actors such as user groups, researchers, service providers decision makers, etc.	Still valid

	This can be done through seminars, workshops and networks aimed at the exchange of good practice. Resources are required for this.	
3	The HANDYNET system should be made more available and accessible to the public. Other ways of information provision should also be explored and stimulated. The Commission has a major role to play in providing information on devices and systems for people with disabilities.	Ways should be found to exploit the potential of the EASTIN, of the various national information systems, and of the various AT information resources available in the Internet.
4	Actions are required to stimulate national and European awareness of (accessibility in) service delivery systems, and to promote research programmes in this field.	Still valid
5	Since movement across the borders is one of the fundamental points in the Treaty of the EU, it is recommended to study the possibilities for users to get access to service delivery systems in other than their own countries (e.g.: maintenance and repair of technical aids). This seems to be a "grey area".	Still valid
6	Bureaucratic rules and complicated financial rules and administrative barriers often extend the duration of the provision of technical aids and can even be a barrier. It is recommended that the European Union and member states set aside funds for studies of financial and administrative procedures. These studies should include pilot projects.	Still valid

Competence

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	It is recommended to organise courses and training on an international level, without forgetting the national, cultural and regional influences. This gives opportunities to professionals to exchange on international level. Such courses should include the following topics: 1) methodologies of assessment; 2) new possibilities and technologies; 3) management aspects within service delivery systems. Organisations of professionals, users, schools and universities should be involved to set minimum requirements for further education.	Still valid
2	It is recommended to make an inventory of existing centres of excellence (special resource centres) throughout Europe.	Still valid
3	It is recommended to initiate the creation of an international network between these centres to stimulate international and regional cooperation and exchange.	Still valid
4		In order to facilitate harmonization across Europe, studies should be carried out to identify and codify good practices (e.g. minimum standards of good service delivery). In order to avoid fragmentation of the knowledge base, resources and tools should be created for gathering and disseminating knowledge that can be used as well as enriched with the contributions of users and all other stakeholders.
5		An ethical code for AT practitioners should be designed and implemented, either as a stand-alone certificate or as part of a wider AT competence certification programme.

Coordination

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	There should be a European structure for coordination and dissemination of information and knowledge with respect to: a) European AT research and development b) good practices in service delivery systems.	Still valid
2	It is recommended to initiate a study on what is the best kind of structure for this purpose.	Still valid
3		A European system to notify both professionals and users of product recalls or alerts could be operated, perhaps incorporated into EASTIN. An alert, warning or recommendation under this system should be viewed as a responsible action by the manufacturer and not viewed as an indication of failure or poor practice.

Efficiency

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	Service delivery systems should develop systems or procedures for self-correcting quality control of the process and the outcome. Development of tools, procedures and expertise for self-regulating systems is recommended.	Still valid

Flexibility

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	Maintenance and repair is a common challenge. More studies are needed to find good solutions.	Still valid
2	There should be European development plans for the needs of people with uncommon disabilities and uncommon technical aids.	Still valid
3	More research should be done concerning service and product delivery.	Still valid
4	Training in research methods should be included in basic education. There should be research opportunities at clinical level.	Still valid

User influence

	Previous HEART recommendations (1995)	Updated recommendations (2012)
1	There is a lack of systematic procedures for collecting user feedback all over Europe. Specific actions should be taken to develop common methodologies for this.	Still valid
2	It is recommended that the Commission sets aside funds to carry out studies on user involvement in service delivery of technical aids. These studies should include actions to raise awareness on the issues involved with service delivery among user organisations and pilot projects, where users and user organisations together with administration try innovative	Still valid

	approaches to user involvement in service delivery.	
3	A pilot project at European level is recommended to investigate suitable financial support to user organisations for increasing their influence in the service delivery system.	Still valid

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