

ASSISTIVE TECHNOLOGY IN THE UK
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Executive Summary

“If one young person is enabled to take up permanent employment in adulthood as a result of being supported early on to use an electronic communication aid, this will realise an estimated £500,000 in benefits to the economy over a lifetime.” Jean Gross¹

According to the British Assistive Technology website, assistive technology (AT) is any product or service that maintains or improves the ability of individuals with disabilities or impairments to communicate, learn and live independent, fulfilling and productive lives. Others use slightly different definitions or refer to Assistive ICT (Information and Communication Technology).² Although there are subtle differences in some instances, in this report, those two terms, or an amalgamation (AT/Assistive ICT), are used interchangeably.

Based on the available data, the number of people in the UK who need to use AT/Assistive ICT is increasing dramatically:

- 29 million (57%) of 18 to 64 year olds are likely or very likely to benefit from using assistive ICTs.³
- There are 11 million disabled people in the UK (19% of a population of 63 million).⁴ Many of these people will benefit from using assistive ICTs.
- In 2030 the number of disabled people will rise to around 17 million.⁵
- The prevalence of disability rises with age. Around 6 per cent of children are disabled, compared to 15 per cent of working age adults and 45 per cent of adults over State Pension age.⁶
- By 2033, 23 per cent of the population will be aged 65 and over compared to 18 per cent aged 16 or younger.⁷
- By 2033 the number of people aged 85 and over is projected to more than double again to reach 3.2 million, and to account for 5 per cent of the total population.⁸ By 2061 the number of people aged 85 and over is projected to be nearer 5.5 million.⁹

¹ Gross, J., (2011), Two Years On: final report of the Communication Champion for children <http://tinyurl.com/d7udhb8>

² BATA (2013), <http://www.bataonline.org/further-assistive-technology-definition>

³ Microsoft/Forrester (2003) <https://www.microsoft.com/enable/research/phase1.aspx>

⁴ and ⁶ Family Resources Survey 2010/11 <http://odi.dwp.gov.uk/disability-statistics-and-research/disability-facts-and-figures.php#1>

⁵ King's Fund <http://www.kingsfund.org.uk/time-to-think-differently/trends/disease-and-disability>

⁷ and ⁸ DLF <http://www.dlf.org.uk/content/key-f>

⁹ 2011 Census http://www.ons.gov.uk/ons/dcp171778_270487.pdf

If the employment rate for disabled people was moved to the national average, an estimated additional 1.3 million disabled people would be in work: boosting the UK Gross Domestic product (GDP) by at least £13 billion¹⁰.

With around 1,500 products available, 1000 business entities, 10,000 employees (with many more employed with AT as just part of their role) and an estimated contribution to GDP of around £ 70bn ¹¹ - all figures to be treated with caution - the sector is complex and challenging for all stakeholders, not least the end user.

Examples of outstanding products and practice include:-

- A portfolio of products both commercial and open source winning international awards and recognition¹²;
- Disabled Students Allowance (DSA) - 54,000 disabled students received grants worth over £125m in the 2010/2011 academic year. AT related products and services accounted for some £50m of that expenditure¹³;
- Access to Work (cost £105 million in 2010 - 2011 with £ 5.25 million being spent on assistive technology for the benefit of around 3000 individuals and the organisations in which they work)¹⁴;
- Funding schemes such as the Technology Strategy Board (TSB) and Small Business Research Initiative (SBRI) driving AT innovation¹⁵;
- Third Sector contributions such as 126 local societies for the blind meeting the needs of 350,000 people¹⁶.
- The British Disability Forum (BDF) and the British Task Force on Assistive Technology (BTAT) offering support to businesses;
- High level of involvement in European initiatives and projects (for example those funded under the Seventh Framework Programme, FP7, and the Life Long Learning Programme).

Given the strong examples cited above, it is surprising that the AT sector is not more recognised for its economic contribution to the UK and for its part in significantly enhancing the lives of millions of disabled and older people. BATA aims to increase understanding of the benefits of assistive technology to individuals and the economy.

¹⁰ SMF Foresight http://www.smf.co.uk/files/7613/2317/4039/Delivering_full_employment.pdf

¹¹ Various - see section 6.1.2 of the main report

¹² See section 6.8 of the main report

¹³ AbilityNet <http://www.abilitymagazine.org.uk/Articles/Article-253-3.aspx>

¹⁴ Access to Work Official Statistics

¹⁵ See section 6.6 of the report

¹⁶ The Internal Market for Assistive ICT Report (2011)

http://ec.europa.eu/information_society/activities/einclusion/library/studies/docs/final_at.pdf

<http://www.abilitymagazine.org.uk/Articles/Article-253-3.aspx>

1. Introduction

The purpose of the research is to establish firstly, the scope of the assistive technology (AT) sector in the UK; secondly its scale in terms of employment (number of jobs); and thirdly, its value to our economy in terms of Gross Domestic Product (GDP). This information has not been previously brought together in this way. The baseline data will be used by the British Assistive Technology Association (BATA) in its campaigning work on behalf of those whose lives are or could be improved through the use of assistive technology. The research for this report was undertaken in 2012-13. The intention is to review it at regular intervals. While every effort has been taken to cite sources for figures used and they are published in good faith, BATA advises caution in the use of some and it accepts no legal liability for accuracy.

AT can be life-changing and for many it is vital to independence and for a productive and enjoyable engagement in and contribution to society. The explosion of high tech devices and software, the convergence of mainstream, assistive technologies, assistive Information and Communication Technologies (ICTs) and assistive living technologies (ALTs), and greater accessibility generally with mainstream devices, has resulted in increased consumer choice and opportunity but a bewildering array from which to choose. The sector is complex with many stakeholders.

This report, in order to describe the current state of the sector, seeks to overcome the challenges presented by this task:-

- the size, scale and shape of the industry is difficult to measure because:
 - there are many small businesses and enterprises providing products and services which are not registered;
 - products in general do not have to meet industry standards and are not registered;
 - there are many people who work in the service side where assistive technology is often a small part of their role;
 - in general anyone can produce AT products and anyone can give advice and guidance and training on AT products and assess user needs;
- there is a blurring of the boundaries around mainstream technology, assistive ICT and assistive living technology (ALT), medical technology;
- there is no funded central database of AT products, assessors, advisers, training providers and related sources of information. This makes it very difficult for anyone to make adequately informed choices;
- services and equipment are often paid for by a body other than the end user but this environment is changing as more people become self-funding or at least responsible for their funding;
- funding sources and the availability of funding change throughout the course of a person's life;

- overall needs of the population are changing due to an ageing population and raised expectations about the quality of life against a background of rapidly advancing technological change;
- project funding for development of AT is available from a number of sources but there is limited centralised knowledge and some duplication and overlap.

Access to fit-for-purpose AT may be controlled by a range of gatekeepers – professionals and carers - who themselves may not be able to keep fully up-to-date. There is nothing in place that ensures that the end user receives the right equipment for the right task at the right time consistently and throughout their lifetime.

2. Definition of assistive technology

For the purpose of this report, the definition of AT is as on the BATA¹⁷ website:

“Assistive technology is any product or service that maintains or improves the ability of individuals with disabilities or impairments to communicate learn and live independent, fulfilling and productive lives.” Examples of this are:-

- computer hardware e.g. special switches, keyboards, and pointing devices;
- computer software such e.g. screen-readers or communication software;
- specialised curricular and educational software.

What is not included is ‘architectural products (such as specialized elevators, lifts, ramps or grab bars), transport products (such as wheel chairs (though devices attached to them may be) and adapted motor vehicle), prosthetic devices (such as artificial limbs and eyes), and hearing aids.’ These may be termed ‘medical ATs.’

In essence this is much in-line with the definition of Assistive ICT as used in the report The Internal Market for Assistive ICT (Deloitte, 2011, p.6).¹⁸ The Deloitte paper focuses particularly on ‘those Assistive Technologies that enable accessibility and usability of Information and Communication Technologies, referred to throughout the study as assistive ICT.’

In this report, while attempts are made to distinguish between the different definitions where these are of significance, generally the terms AT and Assistive ICT (or an amalgamation) are used interchangeably.

Other definitions are used by organisations and reports mentioned in 1.1 and other important resources/initiatives such as FAST which include medical ATs mentioned above. The Kellogg’s report uses the term ‘assistive learning technologies’ (2012, pp 11 - 17) which is valid but may be considered too narrow for the purposes of this report.

¹⁷ BATA (2013),

¹⁸ The Internal Market for Assistive ICT (2011)

http://ec.europa.eu/information_society/activities/einclusion/library/studies/assistive_market/index_en.htm

ISO 9999:2011¹⁹ establishes a classification system of assistive products, especially produced or generally available, for persons with disability. The specific category of interest is Assistive Products for Communication and Information. Not all of the products listed under this category are relevant for example those relating to hearing aids and alarm systems. This system is considered further under European AT databases which utilise this standard of identification.

Due to this variance of definition it is very difficult with certainty and accuracy to find, benchmark or compare information on AT/Assistive ICT within the UK, in Europe and internationally, but, with that caveat, this is what this report is a first attempt to do.

3. Related databases, initiatives and projects

In this section, a selection of related databases, initiatives and projects which have been used as a basis for this report are highlighted. There is also related work being carried out on a European level and this is addressed in section 7 below.

3.1 Databases of products, services and projects

There is currently no funded central information related to AT products, services, projects and initiatives.

3.1.1 The Disabled Living Foundation²⁰ (DLF) website hosts a subscription database which is aimed at professionals rather than end users. The AskSara section of the DLF website helps end users, via a web-based self-assessment tool, find advice and a small selection of products that make daily living easier.

3.1.2 The EmpTech²¹ database is funded by a small number of organisations. EmpTech aims to provide information and resources on assistive technologies that are designed to help those with specific difficulties or disabilities work and study more effectively. There is quite a focus on assistive ICTs but products do include ergonomic equipment and furniture.

The database includes product descriptions, links to manufacturers and suppliers as well as other related resources including advice and training guides. News items linked to the use of assistive technologies are regularly posted and updates occur on a weekly basis. The database is maintained on a voluntary basis and does not have the capacity to use the ISO9999:2011 international classification of assistive products.²² Therefore information cannot be integrated into the European databases as described in section 7.

¹⁹ISO9999:2011 http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=50982

²⁰ DLF

<http://www.dlf-data.org.uk/products.php?groupid=3806&sortname>

²¹ EmpTech www.emptech.info

²²ISO 9999:2011

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=50982

3.1.3 The Foundation for Assistive Technology (FAST²³) ‘was founded in 1998 to tackle the inadequate design of assistive technology products and services. Fast uses a wide definition of AT and includes telehealth and ALT . “Assistive Technology is any product or service designed to enable independence for disabled and older people.”

On the FAST home page it is stated, ‘*The failure to develop a thriving market in equipment that meets the real needs of disabled and older people is a major barrier to independent living. With limited resources, FAST’s strategy for achieving maximum impact is to work at a national, strategic level to highlight the complex causes of this failed market and to bring the sector together to find innovative ways of working, in partnership with disabled and older people.*’ It is not clear what progress has been made in terms of addressing ‘this failed market’ and indeed what is meant by a failed market. In addition the market as described covers the full range of assistive technologies and consequently a very wide range of consumers with very different needs.

3.1.4 Open Source Assistive Technology Software (OATs) is a project which started in 2006. It is essentially a forge (a place where software is developed), repository and database and is aimed at developers, professionals and end users. Of specific interest are the facilities to search for ATs, comment and provide feedback directly to developers.

3.1.5 It should be noted that there are a number of small databases of information provided by commercial organisations such as yourDSA²⁴ which only provides a selection of products and services.

3.2 Reports

3.2.1 HM Government’s *Strength and Opportunity Report (2011)*²⁵ is a commentary on the economic situation of the UK’s life sciences industry. ‘*The data relates to companies that are active in the UK in three of the life sciences sectors: medical technology, medical biotechnology and industrial biotechnology. It enables comparisons against last year’s information to see how these sectors are changing. It is an overview of this highly innovative industry with over 4,500 companies, employing over 167,000 people and generating a turnover of over £50 billion.*’

Within the medical technology sector is an assistive technology segment. There is no definition of this term as used in the report so it is assumed that it refers to medical devices and as such does not include ATs as referred to in this report although it is possible that some Alternative and Augmentative Communication (AACs) are included. It will overlap significantly with technologies which are included in the FAST database. In the medical technology sector, turnover for 2011/12 was around £ 750 million, the number of employees around 4,500 and the number of companies

²⁴ yourDSA <http://www.yourdsa.com/about-us/>

²⁵ Strength and Opportunity Report (2011) <http://www.bis.gov.uk/assets/biscore/innovation/docs/s/12-p90-strength-and-opportunity-2012-medical-technology-sectors.pdf>

around 320. Two other segments of relevance in the sector are education and training and professional services and consultancy. As discussed later in section 5 these are some of the technological areas which are likely to converge over the next 20 years.

This model of reporting would be suitable for the assistive ICT segment but this presents some challenges (including those presented in the introduction). The main difference is that the medical technology sector is regulated in that products and services must be registered and conform to specific standards. In addition suppliers to the Government including the NHS will be on registered lists of suppliers. An issue is that products that are used as assistive ICTs might be mainstream products such as a tablet PC so that even if products were required to be registered there would be products which would not be covered. In addition registration of products might stifle innovation.

Because there is almost no other means of benchmarking aspects such as size and turnover this segment has been useful as a means of gaining a perspective on what the assistive ICT segment in this context might be like in terms of scope and scale and the type of information required to inform this report.

*3.2.2 Current Perspectives on Assistive Learning Technologies: 2012 review of research and challenges within the field*²⁶ is a publication from the Centre for Research into Assistive Learning Technologies.²⁷ The report describes a review of literature on assistive learning technologies, or digital technologies designed to support learners with special needs in education. The focus was to build up a picture of the state of research in the field, as well as highlighting areas where the research is lacking, in order to identify possible topics for future research.

The conclusion that is of most relevance here is that in an educational context, there is inequality of provision with some learners receiving extensive and appropriate support and others struggling *'to get the help that they need within a complicated and often inconsistent system. The overload of information available may also exacerbate this..... One particular direction for research that is needed is in exploring the 'gaps' in the system, such as transitions between educational systems (for example from school to further or higher education), or in supporting informal and self-directed lifelong learning in the workplace or for personal development (p.61)'*

*3.2.3 AT Alliance - Mapping the Information Environment and Anarchy or Opportunity? The future for Assistive Technology information services (2011)*²⁸ - is a report co-written by FAST²⁹, the AT Alliance, Ricability and DLF. In this they conclude that while there has always been an 'information maze' in services for older

²⁶ Current Perspectives on Assistive Learning Technologies
<http://www.kellogg.ox.ac.uk/sites/kellogg/files/Current%20Perspectives%20on%20Assistive%20Learning%20Technologies.pdf>

²⁷ Centre for Research into Assistive Learning Technologies
<http://www.kellogg.ox.ac.uk/researchcentres/alt>

²⁸ AT Alliance <http://www.at-alliance.org.uk/projects.php>

²⁹ FAST Website <http://www.fastuk.org/>

and disabled people and in the area of AT provision, it seems likely that the need for information about AT will increase as the environment of supply services becomes more complex. This may be due to funding cuts meaning involvement of the private and third sectors will become more important.

3.2.4 FAST

FAST delivers an annual report³⁰ to Parliament which documents the research and development activity funded by the UK government. In the year from April 2011-March 2012 FAST recorded 228 projects carrying out research and development activity in assistive technology over the year, of which 82 concluded during the year, a similar level of activity to that recorded in the previous year's report.

4. Who uses AT?

There are over eleven million people with a limiting long term illness, impairment or disability in Great Britain³¹. That is not to say that they would all benefit from using AT/Assistive ICT but there are also likely to be many who are not registered as disabled who would find their lives improved through the use of the right AT.

In Working Better (ECHR, 2012)³² it is stated that there are clear benefits for the UK economy in closing the disability employment gap. The government spends £7 billion on out of work benefits for disabled people (Sayce, 2011)³³ yet this could be reduced substantially. If the employment rate for disabled people was moved to the national average, an estimated additional 1.3 million disabled people would be in work: boosting the UK GDP by at least £13 billion (Evans, 2007).³⁴

The potential number of users of AT is very difficult to calculate as it may not depend on the actual disability but rather on functional ability. For example on 31 March 2011, 147,800 people were on the register of blind people and 151,000 people were on the register of partially sighted people.³⁵ However according to RNIB there are around 2 million people struggling with sight loss.³⁶ In addition many people have more than one disability, for example people with a learning disability are ten times more likely to have a sight problem.³⁷ Many cognitive disabilities (such as dyslexia) may also be greatly helped by the right AT. Even as far back as 2003

³⁰ FAST Annual Report http://www.fastuk.org/pagedocuments/file/S22%20Report%202011-12_pdf.pdf

³¹ DWP Statistics <http://research.dwp.gov.uk/asd/frs/>

³² Equality and Human Rights Commission Working Better <http://tinyurl.com/cpgam9y>

³³ Sayce (2011) Getting in, staying in and getting on

³⁴ SMF Foresight http://www.smf.co.uk/files/7613/2317/4039/Delivering_full_employment.pdf

³⁵ Health and Social Care information Centre <http://www.ic.nhs.uk/pubs/blindpartiallysighted11>

³⁶ RNIB

http://www.rnib.org.uk/professionals/solutionsforbusiness/publishing/pages/publisher_business_case.aspx

³⁷ RNIB

http://www.rnib.org.uk/aboutus/contactdetails/scotland/scotlandnews/pages/learning_disability_week_scot.aspx

(Microsoft/Forrester)³⁸ it was acknowledged that 57% of 18 to 64 year olds are likely or very likely to benefit from AT/Assistive ICTs.

4.1 Future demographic trends - the ageing population

The prevalence of disability rises with age. Around 6 per cent of children are disabled, compared to 15 per cent of working age adults* and 45 per cent of adults over State Pension* age in Great Britain. As more children born with disabilities survive into adulthood, the total of adults with disabilities is likely to increase.

Over the last 25 years the percentage of the population aged 65 and over increased from 15 per cent in 1983 to 16 per cent in 2008, an increase of 1.5 million people in this age group. Over the same period, the percentage of the population aged 16 and under decreased from 21 per cent to 19 per cent. This trend is projected to continue. By 2033, 23 per cent of the population will be aged 65 and over compared to 18 per cent aged 16 or younger. This is shown visually in the chart (Fig 1) below.

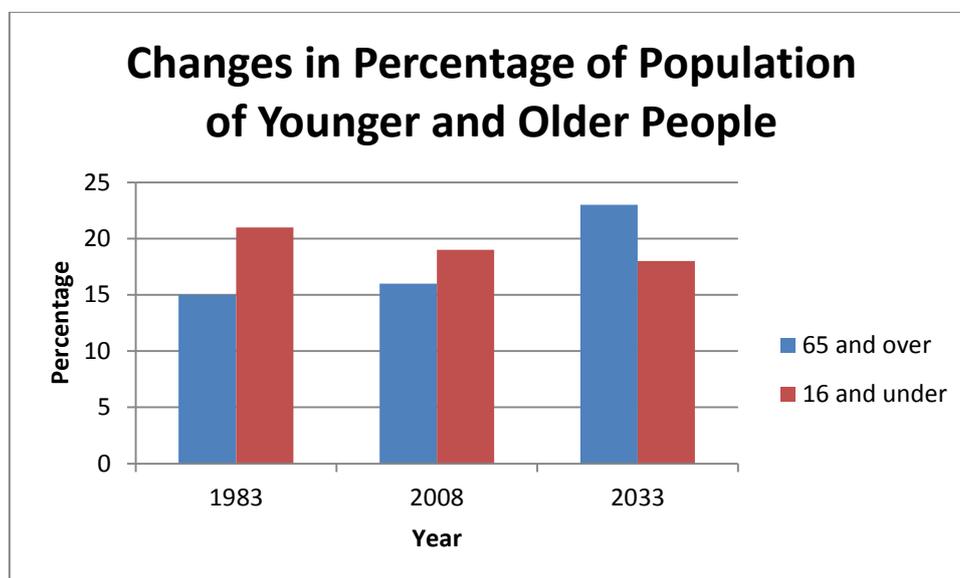


Figure 1 – Changes in percentage of population of Younger and Older people

According to Age UK the fastest population increase has been in the number of those aged 85 and over, the 'oldest old'.³⁹ *In 1961 there were around a quarter of a million people in this age group and in 1983, there were just over 600,000. Since then the numbers have more than doubled reaching 1.3 million in 2008. By 2033 the number of people aged 85 and over is projected to more than double again to reach 3.2 million, and to account for 5 per cent of the total population. By 2061 it will be nearer 5.5 million.*⁴⁰ This is set out visually in the chart, Fig 2 below.

³⁸ Microsoft/Forrester (2003) <https://www.microsoft.com/enable/research/phase1.aspx>

³⁹, ⁴¹ Age UK <http://www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/Improving%20Later%20Life%20%20WEB.pdf?dtrk=true>

⁴⁰ DLF <http://www.dlf.org.uk/content/key-facts>

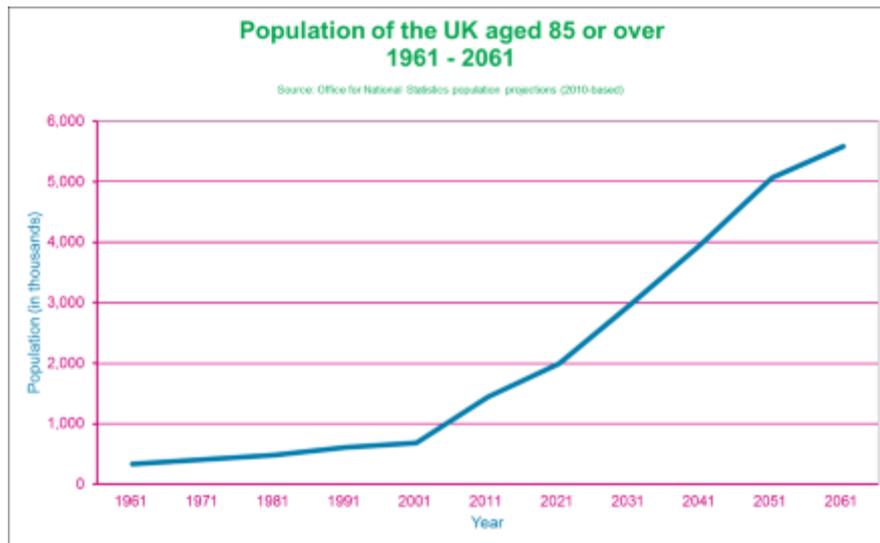


Figure 2 – Population of the UK aged 85 or over 1961 to 2061⁴¹

Plum (2010, pp 29 and 30) posits that the real problem is that, as people live longer, the period of life with disability increases. Currently life expectancy increases by 77 days each year while healthy life expectancy increases by only 49 days. So in the next 20 years the life expectancy for a 20-year-old will, on current trends, increase by 4.2 years but healthy life will increase by only 2.6 years.

However it should not all be seen in a negative light, key messages coming out of *Understanding the Oldest Old*⁴² are :

- 'Life is not over once you hit 85. In fact, most people over this age are rather independent, feel that their health is good, enjoy a good quality of life, and have more than a few years of life left.
- People get more diverse the older they get.
- Assumptions based on the younger old can be totally inappropriate for the oldest old.
- No matter what chronological age a person is, it is still worth treating health problems.'

Older people, due to declining physical functionality or impairments, are more likely to need to use AT to access computers. With a shift to online services (digital by default) and telecare/eHealth older people will need to use technology and this might be accelerated with a convergence of technologies. Also more people who fall into the older people category will be used to using technology ('digital natives').

The point about the above is that there is going to be a significant increase in the number of older people over the next few decades and therefore the number of

people using AT including assistive ICT. There is no system in place to support these people aside from where they might be supported due to health care needs.⁴³

5. Trends in technology/assistive technology

Over the past few years there have been a number of significant changes in technology. These changes include cloud computing, portability of devices, the social impact of Web 2.0 technologies and the explosion of apps. All of this is moving forward at a pace which even experts have to work hard to keep up with. Over the next ten years thought activated/brain-computer interaction technology, augmented reality and advanced robotics, for example, will become more widely available and/or affordable. Users may become the designers and creators of their own assistive ICT and assistive technology through the use of 3D printing for example.

At the same time there has been convergence and overlap between mainstream and assistive technology. Accessibility features have in some cases become integrated into devices such as mobile phones and tablets, and have become part and parcel of some software packages and operating systems. Mainstream technologies have become assistive devices in themselves with significant investment in personally owned devices with dual purposes. More people who would not otherwise use AT may be benefitting without being aware that these 'user aids' are examples of AT.

6. Commentary on the AT Stakeholder Map

The stakeholder map at Appendix 1 is divided into a number of areas with which the end user might engage with and/or access AT/Assistive ICTs. In this section of the report each of the main areas is considered in turn. The following points are considered further below:

- Technology;
- Business;
- Education and training;
- Courses and qualifications;
- Assistive ICT Training;
- AT Research;
- AT Projects;
- Third Sector/Charities;
- Awards;
- Conferences and exhibitions;
- Government.

⁴³ Skills for Care

http://www.skillsforcare.org.uk/workforce_strategy/assistedlivingtechnology/assisted_living_technology.aspx

6.1 Technology

6.1.1 Mainstream Technology

There is a convergence in some areas of mainstream technology and AT. Products may have assistive technology features built in rather than previously where AT was bolted on. Examples of this are magnification, screen readers and text to speech/speech to text built into operating systems on a PC or mobile device. The explosion of tablet PCs and apps has added to consumer choice and in many respects it has added to the complexity, not just because there are more products to choose from but it has made it more difficult to choose the right product. In some cases a built-in accessibility feature will meet user needs and be better than not using the feature. However in many cases there may be another technology that will do the job better. If the end user does not have in-depth knowledge about what is available they may be making do with, at best, a solution which is 'good enough' when, with proper assessment and advice leading to the most appropriate AT, that individual's access to life, learning and leisure could be so much better.

It is almost impossible to measure what products, in relation to turnover and/or size of workforce, are actually being used as AT and therefore it is not possible to estimate with any certainty the contribution to GDP. If mainstream technologies are being recommended as AT/Assistive ICTs as part of a formal assessment, then there would be some record but, even then, this would only be the tip of the iceberg in terms of actual usage.

6.1.2 AT/Assistive ICT Commercial Sector

The size, scale and shape of the industry are difficult to measure because:-

- there are many small businesses which are not registered and products in general do not have to meet industry standards.
- there are many people who work in the service side where assistive technology is often a small part of their role.
- some third sector organisations and charities have a commercial arm.

Based on the research done for this report, the commercial AT/Assistive ICT sector is made up of approximately 1,000 businesses and enterprises and approximately 1500 products. This figure is based largely on the company information section in the Emptech database and discounting those which are not UK based and/or do not provide what is defined as an AT/Assistive ICT for the purposes of this report. Other aspects taken into consideration are those employed in providing advice and guidance, support and assessments and training on a commercial basis many of whom will be self-employed.

It is likely that a majority are micro business with a small percentage being small and medium enterprises (SMEs) and a tiny percentage being larger companies. Some are limited companies and there is some information about these via the Companies House database and a small number file an annual report from which it is possible to gain some information regarding export activity for example. However a search is

difficult due to the fact that AT/Assistive ICT does not have a specific code and products and services can be identified in various ways.

Since it is difficult to ascertain the size and exact nature of the businesses, it is difficult therefore to estimate the total workforce so any figures must be treated with caution. It is likely to be around 5,000 to 6,000 for the commercial sector. In terms of people employed, this figure will increase greatly when, as well as those working in commercial businesses, those in education and the third sector are included. It is estimated that there are around 5,000 people who have a specific AT/Assistive ICT role so that the total number of employees could be around 10,000 – or many more.

Contribution to GDP is equally difficult to estimate and what follows must be treated with caution. It is important to distinguish between value per annum and value over a lifetime and to be clear about the impact of other factors. One approach could be to take the number of students who have received DSA and multiply this by £180,000 which is 'the additional contribution to the Exchequer of a graduate compared to an individual with A-levels over a working lifetime is approximately £180,000.'⁴⁴ If the number of students who have received DSA is estimated to be 300,000 then this would give a figure of £54 billion. However not all of these students would be funded for equipment and not all of the equipment would have made the difference between getting a job or not. In addition, some people with disabilities will earn without the benefit of DSA and some who had DSA may not go on to work. This £54 billion figure could then be added to the £13 billion figure related to an additional 1.3 million disabled people being in work⁴⁵. If that was accepted, then, allowing for inflation, the figure could be around £70 billion. Even with these caveats, it is apparent that there is a considerable return on a relatively low investment from the Government and from a relatively small sector. It may therefore be argued that the cost of assessing user need, purchasing the right equipment, training and support, is relatively low compared to the benefit to the end user and the economy.

According to Jean Gross, Communication Champion (2011), *If one young person is enabled to take up permanent employment in adulthood as a result of being supported early on to use an electronic communication aid, this will realise an estimated £500,000 in benefits to the economy over a lifetime.*⁴⁶

6.1.3 FOSS

Many free and open source software (FOSS) and indeed hardware tools can be of benefit to people with disabilities or impairments as well as those without. There are literally thousands of FOSS tools available, from portfolio tools and software for designing accessible learning objects through to simple widgets and programs to help users see the cursor on the screen. For many tools, there are communities of developers and users who continue to improve them and who can offer support and

⁴⁴ FURTHER HIGHER? Tertiary education and growth in the UK's new economy
http://www.ucu.org.uk/media/pdf/m/o/further_higher_report_final.pdf

⁴⁵ ⁴⁵ SMF Foresight http://www.smf.co.uk/files/7613/2317/4039/Delivering_full_employment.pdf

⁴⁶ ⁴⁶ Gross, J., (2011), Two Years On: final report of the Communication Champion for children
<http://tinyurl.com/d7udhb8>

advice to new users, for example Open Source Assistive Technology Software (OATS)⁴⁷, Vinux and Xerte. It should be noted that many of these technologies are free of charge but some operate on a freemium or similar basis.

Due to its nature it is virtually impossible to gauge the scale of FOSS AT activity. Some might be engaged as part of their employment but many people develop FOSS products in their spare time.

6.2 Business

AT/Assistive ICT support for disabled people in employment is limited. Access to Work cost £105 million in 2010- 2011 with only £ 5.25 million being spent on assistive technology for around 3000 recipients. The number of people helped peaked in 2009-2010 but fell the following year and may fall again in 2012-13.⁴⁸ BATA's own report *Assistive Technology in the Workplace* (June 2013) suggested a number of problems and some strengths. Other issues with Access to Work include:-

- Low awareness of the scheme from both an employer and employee perspective, as in the region of 74% of employers are unaware of Access to Work⁴⁹ (NB This was in 2002 and a more recent figure could not be found though more recent reports state that awareness is low⁵⁰);
- The process of applying and getting Access to Work funding can be slow;
- Provision of assessment services is often run on a shoestring with an assessor being paid around £100 to research equipment and disability needs, carry out the assessment, write a report and travel to and from the assessment.

Some larger companies take responsibility for disabled employees as evidenced by the Business Disability Forum (BDF). The Employer's Disability Forum (EDF) which was formed in 1986 and re-launched in 2012 as the Business Disability Forum⁵¹ with a focus on ensuring that the benefits of becoming disability-smart are felt right across organisations and society.

The British Disability Forum (BDF)⁵² offers amongst other things, employers' practical support in all aspects of recruiting, retaining and developing disabled employees and has approximately 330 members. These are all larger companies and organisations and it is likely that there will be a number of assistive technology specialists

⁴⁷ Open Source Assistive Technology Software <http://www.oatsoft.org/Software>

⁴⁸ http://research.dwp.gov.uk/asd/workingage/index.php?page=atw_arc

⁴⁹ Goldstone, C and N Meager (2002), *Barriers to Employment for Disabled People*, NOP Consumer and the Institute for Employment Studies, DWP report No 95, London, DWP

⁵⁰ DWP Evaluation of Access to Work: Core Evaluation
<http://research.dwp.gov.uk/asd/asd5/rports2009-2010/rrep619.pdf>

⁵¹ and ⁴⁴ Business Disability Forum <http://businessdisabilityforum.org.uk>

employed directly as well as the use of consultancies to provide support. Aside from the accessibility and assistive technology professionals there will be other areas where a knowledge of AT is necessary.

- HR and diversity professionals;
- Occupational health advisers;
- ICT professionals;
- Health and safety specialists.

The British Task Force on Assistive Technology (BTAT)⁵³ was launched by the EFD. BTAT's vision is that accessibility and usability for all will be fundamental to ICT, so removing barriers to disabled customers and employees alike. *'because the technology which should liberate talent and productivity makes it unnecessarily difficult to recruit and retain good employees, and to do business with millions of disabled and older customers.'*

Over 200 employers have been involved for the last two years in creating the Disability Clearkit⁵⁴, led by a central steering group (Disability Employers Steering Group) of organisations including E.ON South Eastern, the UK Border Agency and HMRC as well as BT. The programme was initiated by the Department for Work and Pensions under the previous government, and developed with a commercial partner, The Clear Company.

An example of how employers use accessible ICT is described below and has been taken from p.4 of the Houses of Parliament POSTNOTE (May 2012)⁵⁵

'Lloyds banking Group have 100,000 employees. 3,000 are recorded as disabled, but 6,000 have been helped through the LBG Workplace Adjustment Scheme. The majority (around 80%) of the adjustments are ergonomic changes. Around 75% of participants say that they are more productive as a result, which is seen as justifying the average adjustment cost of £1,300. The scheme's success is attributed to high level executive engagement with the initiative. Development of a centralised scheme removed the burden of making changes from line managers, who may not be aware of best practices. When the cost of adjustment is contrasted with the cost of hiring and training a new clerical grade member of staff, put at £7,750, there is also a strong business case for the scheme.'

6.3 Education and Training

It is estimated that there are around 130,000 staff in education supporting disabled learners with a small percentage having AT as a significant part of their role. These figures are estimates as it is very difficult to ascertain exact numbers. For example, even in a specialist college with say 100 students there will only be one or

⁵³ British Task Force on Assistive Technology <http://www.btat.org/>

⁵⁴ Clearkit <http://www.clearkit.co.uk/>

⁵⁵ POSTnote 411 ICT for Disabled People - POST Note
<http://www.parliament.uk/briefing-papers/POST-PN-411.pdf>

two staff who have a dedicated AT role. This will be a similar situation in a GFE or HE institution with much greater numbers of disabled students (around 8% of the total number of students).

6.3.1 Schools

In schools in England there are around 1.5m children with special needs (with or without statements).⁵⁶ Equipment needs and support currently comes from Local Authority Children's Services and in some areas Children's Trusts, Social Services in England and Wales or Social Work Departments in Scotland and Health and Social Services Boards or Trusts in Northern Ireland. In many cases the school receives funding for specialist equipment for a specific child but the equipment or technology can be shared.

The green paper on special educational needs (SEN) and disability, *Support and aspiration*,⁵⁷ set out the Government's commitment to giving families of children with the proposed Education, Health and Care Plan the option of taking up a personal budget by 2014. One element of a personal budget can be a direct cash payment made to a family or carer to buy a service or a piece of equipment for their child. This will mean that the equipment will be owned by the child or young person.

6.3.2 Further Education

There are around 500,000 students in FE⁵⁸ with a disability with a considerable number of disabled learners in the wider skills and other sectors and including work based learning, Independent Specialist Colleges (ISCs) and prisons. Funding of equipment will vary across these segments and is in many cases ad hoc.

In General FE equipment is funded by the college or SFA. Further education institutions in England and Wales receive government funding for costs of providing additional support to disabled students. These funds may be used to provide AT for disabled students. The first point of contact should be the further education institution's additional learning support adviser.

AT training in FE colleges is variable: in some colleges there are units with high levels of support for disabled learners and expertise in AT whereas in other colleges it can be ad-hoc. Training might be provided by someone in the college, someone brought in specifically or sometimes by the companies who supply the technologies (such as when a very specialised item is required for a student). External training

⁵⁶ DFE Statistics <https://www.gov.uk/government/publications/children-with-special-educational-needs-an-analysis-2012>

⁵⁷ Support and aspiration <http://webarchive.nationalarchives.gov.uk/20130401151715/https://www.education.gov.uk/publication/eOrderingDownload/Green-Paper-SEN.pdf>

⁵⁸ Data Service (2012). Statistical First Release. http://www.thedataservice.org.uk/NR/ronlyres/75CE17E4-2DAA-475F-80F9-CA9178D20946/0/SFR_commentary_October_2012.pdf

has to be funded out of the college budget. In general, learners cannot keep their AT when they leave the institution.

6.3.3 Higher Education

There are nearly 200,000 students in HE who have declared a disability.⁵⁹ Support and training is variable but there are pockets of excellent practice. Sometimes support is disparate and spread across separate roles from different departments. Students are able to keep their AT when they leave the institution. Equipment is funded by DSA and in 2010/11 £50.5m went on equipment. There are 440 assessors involved in DSA operating through 40 Access Centres. Around 60,000 students will have passed through the system in 2012.

Provision of computers under DSA has been under review by the Department of Business, Innovation and Skills (BIS) during 2013. BIS has questioned the need to provide equipment for disabled students that is required by all students as part of their studies. According to BIS, quoted in Ability (2013)⁶⁰,

“Technological advancements have been unprecedented, which has resulted in a huge shift in the way that people conduct their everyday lives, from shopping and relaxation to working and studying.”

There has also been a rapid expansion in the type of technology that individuals own and use on a day-to-day basis.

It is against this background that we should review what ‘extra costs’ a disabled student might be required to incur, over and above the costs incurred by all students, with a specific focus on information technology equipment.”

A key issue is that whilst non-disabled students who cannot afford a computer can more easily access institutional equipment in study centres, this will not be so easy for many disabled students. There is a grave danger that disabled students will end up trying to make do with something that is barely ‘good enough’, to the detriment of their studies. The focus should be on assessing need and funding the right (the best) equipment with the right (the best) support.

“I feel that a move to a ‘no-DSA-computer’ environment would create a logistical nightmare for students, suppliers, assessors, disability advisors and AT trainers, and should be resisted strongly at every available opportunity,” said one DSA Needs Assessor.

The DSA-QAG⁶¹ was set up with an aim ‘to safeguard the public interest, to monitor the quality assurance system, to inform and to encourage continuous improvement in the management of quality in the sector through setting up a good practice

⁵⁹ Disabled Students and Higher Education

http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/d/dius_rr_09_06.pdf

⁶⁰ Ability <http://www.abilitymagazine.org.uk/Articles/Article-253-3.aspx>

⁶¹ DSA QAG <http://www.dsa-qag.org.uk>

framework and carrying out annual audits to maintain the desired quality standards. We do this by working closely with assessment centres, Assistive Technology Service (ATS) providers, the student's funding body, Open University and student organisations to define standards and quality, and we carry out regular reviews against those standards.'

The Independent Assessment Centres are a UK wide network of Disabled Students' Allowance (DSA) Needs Assessment Centres.⁶² There appears to be various bodies involved around this arena and it is not quite as clear as it might be. (Section 6.4 below looks at training requirements for assessors.)

6.3.4 Older learners

In terms of learning 16% of 65-74 year-olds and 7% of those aged over 75 regard themselves as having undertaken formal or informal learning during the last three years (Aldridge and Hughes, 2012⁶³). There are around 30,000 students (mainly part-time) over the age of 60 in the UK. With no age limit for fee loans in the UK and with the retirement age rising, there is likely to be an increase in formal learning amongst people over 65.

Whilst the percentage of students with a declared disability is much in line with the younger cohort, it is probable that most of this cohort would benefit from some form of AT/Assistive ICT due to age related difficulties, declining memory capacity being the most significant, alongside visual, hearing and manual dexterity issues. However due to the often gradual onset of these difficulties, the older person might not be aware that they have a difficulty and/or not be aware of the existence of assistive technologies and so the use of such technology might be limited.

6.4 Courses, qualifications and relevant bodies

In the FAST database⁶⁴ there are 34 non-medical AT related accredited courses listed at degree, diploma and certificate level and a small variety of short courses/workshops – although the latter is nowhere near the complete picture.

There are 17 Professional Bodies listed in the FAST database that may provide AT training but in the main these are medical related bodies and the list represents a small number of professional bodies.

It appears that there is no legal requirement for those working in the field of assessment and related advice and guidance to have a relevant qualification and to keep this up to date. There is a CPD requirement in some areas, such as for speech and language therapists.

⁶² IAC-DSA.co.uk <http://www.class.org.uk/IAC/>

⁶³ Aldridge, F., and Hughes D. (2012). NIACE Adult Participation in Learning Survey <http://www.niace.org.uk/niace-adult-participation-in-learning-surveys>

⁶⁴ FAST <http://www.fastuk.org/services/degree.php>

The National Network of Assessment Centres⁶⁵ is piloting a Technology and Implementation Practitioners (ATIP) Competency Framework. The National Association of Disability Practitioners (NADP) also has an accreditation scheme.⁶⁶ There is also the Association of Study Aids & Study Strategies Assessors⁶⁷.

Assistive technologists can often be self-taught, having just picked up their expertise on the job. They might be able to participate in formal CPD such as courses run by the ACE Centre, and engage in informal development via regional networks and social networking links. Recently, support of assistive technology awards has been funded in a small number of GFE Colleges and Independent Specialist Colleges via the Dart 2 project (see section 6.6). It has been observed that a dedicated AT role can make a significant impact on learning and teaching but is often difficult to implement or sustain as the impact can be difficult to measure.

The newly formed, US led, International Association of Accessibility Professionals (IAAP) aims to define, promote and improve the accessibility profession globally through networking, education and certification.

6.5 AT Research

An extensive amount of research into assistive technology has been carried out in the UK and this is evidenced in *Current Perspectives on Assistive Learning Technologies: 2012 review of research and challenges within the field*⁶⁸ already referred to in previous sections. Earlier in this report is an overview of the journals, related conferences and organisations which publish advice and guidance on Assistive Learning Technologies.

Previous literature reviews include *Learning difference and digital technologies: a literature review of research involving children and young people using assistive technologies 2007-2010*.⁶⁹ One of the key changes in the landscape since this review is that there has been a large increase in the use of mainstream technologies.

One of the conclusions in the Kellogg report that is relevant in this section is that 'there is growing understanding of the needs of learners and the capabilities of technologies, and there is evidence of benefits that technology can have to learners with special educational needs. However, there is a need for more longitudinal studies considering the wider context of use, and considering the impact of technology on a person's whole education and wellbeing throughout their life.'

⁶⁵ NNAC <http://www.nnac.org/members/competencies.php>

⁶⁶ NADP <http://www.nadp-uk.org/accreditation-scheme/levels-of-accreditation/>

⁶⁷ Association of Study Aids & Study Strategies Assessors

<http://www.asasa.co.uk/about/>

⁶⁸ Current Perspectives on Assistive Learning Technologies

<http://www.kellogg.ox.ac.uk/sites/kellogg/files/Current%20Perspectives%20on%20Assistive%20Learning%20Technologies.pdf>

⁶⁹ Learning difference and digital technologies: a literature review of research involving children and young people using assistive technologies 2007-2010

<http://www.nottingham.ac.uk/CHS/Documents/AT20072010Abbottetal.pdf>

6.6 Assistive ICT Projects

In the FAST database⁷⁰ there are 19 current 'assistive ICT projects' (totalling around £ 87m with a majority being EU funded projects and with UK organisations receiving a small share) compared to 87 ALT projects. There are a large number of projects listed relating to the needs of people with autism and older people as target groups and brain computer interfaces (BCIs) and The Cloud as current technologies. It is likely that there are more projects that are (not yet) included. One reason for this is that people working in the assistive ICT sector may be unaware of the FAST database and, even if they are aware, they may not consider their projects to be relevant either because of their focus and/or size and/or funding stream.

A range of projects are set out below as examples of what the UK is currently or has been engaged in. ILearnRW and the SBRI projects are in the FAST database but the others, at the time of writing, are not.

6.6.1 ILearnRW

The aim of the project is to develop an Integrated Intelligent Learning Environment for Reading and Writing (the ILearnRW system) which will: support user profiling, incorporates learning/teaching strategies, support the classification of learning material based on user profile, support personalised content, support engaging learning activities, structures the evaluation of learning and incorporates an on-line resource data bank. The project will evaluate the ILearnRW system success in promoting the learning process of reading and writing through field-testing in the UK and Greece. The project is funded by the EC ICT Policy Support programme, is funded for 2,326,600Euros and is led in the UK by Dolphin Computers and will finish in 2015.

6.6.2 The Innovation Labs Project

This is a partnership between Comic Relief, Nominet Trust, Paul Hamlyn Foundation and the Mental Health Foundation. The award of around £375,000 of grants has been made to seven organisations to develop digital products to support young people's mental health. The seven products will be developed between February 2013 and June 2014.

6.6.3 Small Business Research Initiative (SBRI) Projects

Eleven AT projects have been funded recently under the SBRI⁷¹ initiative. Phase One began in April 2011 when seven companies were funded to develop 'proof-of-concept as part of a feasibility study. Phase One finished in October 2011 and all seven companies were successful in developing a proof-of-concept. Four of the projects went forward to Phase 2 which involved further development to take the

⁷⁰ FAST [FAST database](#)

⁷¹ Jisc TechDis <http://www.jisctechdis.ac.uk/techdis/pages/detail/businessandcommunity/SBRI>

products to market. The two strands of funding are described below for a very general overview. These projects are in the FAST database.

Making Waves looked at converting gesture (or sign) language into digital data. Converting gestures into text or audio output enables learners to communicate with other people. In addition, conversion to electronic command signals means that those with limited motor control can gain greater independence.

Plain Sailing focused on helping users to access, view, comprehend and navigate digital information independently and successfully. These champion the use of freely accessible Open Source software packages which can run on the latest technology platforms and give users a personal, customised portal.

6.6.4 FE and Skills Development and Resources Programme

There are eight projects in the FE and Skills programme⁷² which are related to AT and disability:-

- Beaumont College (Dart 2) - improving the capability of staff and providers to use technology for access and inclusion; includes deep support in setting up assistive technologist roles in a small number of providers.
- Henshaws College - Apps and tools for access to social networking services for learners who are blind or visually impaired;
- SE ISP Consortium - Using social networking and access technology to support personal communication and networking;
- West of England College for Young People with Little or No Sight - Web services and portal for young people to support their use of social networking technologies;
- City Lit - E-safety for deaf and hearing impaired adult learners;
- Lancashire Adult and Community Learning Service - adaptation and testing of training and support materials for trainee teachers who are deaf;
- Discover Jisc- to develop a greater understanding of Jisc and its resources to the FE and Skills providers, by helping to promote the development of skills and understanding to optimise the use of accessible technologies and development of inclusive teaching practices.

6.6.5 The Technology Strategy Board

The Technology Strategy Board (TSB) ran the digital inclusion innovation contest at the start of 2013. The TSB set three challenges: using smart phones to assist older

⁷² Jisc Advance <http://www.jiscadvance.ac.uk/cgi-bin/generic?instanceID=20>

people and people with sensory disabilities; helping newspaper readers and making the 'internet of things' accessible. The three sponsoring partners are SCOPE, RNIB and York University.

6.6.6 Jisc Techdis HEAT⁷³ Scheme

The Jisc Techdis HEAT⁷⁴ Scheme began in 2006 as a way to encourage staff in Higher Education to use emerging technologies in innovative and inclusive ways in their teaching practice. Over 210 bids from 112 HE providers have resulted in 85 projects being commissioned over four rounds of the scheme in all disciplines in teaching, as well as staff development, libraries, careers services, support services and more.

Examples of projects include:-

- Developing a set of assistive technology resources to make the Learning Centre accessible to all members of the college community and encourage independent learning by those who would benefit from support.
- Using digital visualisers and remote controls to allow the display, and discussion of, student writing in classrooms that are equipped with a data projector. The technology enabled inclusion of students who were visually and hearing impaired without singling them out; it also enabled students to learn collectively and spontaneously and relieved the everyday stress of preparing a workshop as there is no need for photocopying or creating transparencies.
- Identifying good inclusive practice in the use of portable digital recording devices small enough to carry easily in a pocket. The objective is to help students with a range of learning disabilities enhance their learning, especially in laboratory work, experiments, practical sessions and fieldwork that can be extended to work-related learning. The technology could be useful for students for whom short-term memory, working with text or the ability to record information in real time is a problem. It can facilitate learner independence as students take responsibility for making audio and video recordings they can later use to aid recall.

A recent survey of Round 4 participants reinforced earlier findings that small amounts of funding, when carefully disbursed and with appropriate support in place, can result in disproportionately effective outcomes and developments in the use of technology to drive forward the embedding of inclusive practice in HE institutions. Such funding inspires staff to innovate and collaborate, changes learning and teaching practice and enhances the learning experience for all students, and at relatively low cost.

⁷³ Jisc TechDis HEAT Scheme

<http://www.jisctechdis.ac.uk/techdis/technologymatters/assistivetech/heat>

6.7 Third Sector/Charities

There are at least 2,000 charities and third sector organisations operating in the disability and technology field. Without input from this sector a large number of people would not have access to AT, for example 126 local societies for the blind meet the needs of 350,000 people⁷⁵.

There is a range of non-specific disability organisations such as Ability Net and disability specific organisations such as the RNIB. There are what might be seen as leading charities such as the RNIB but there are also many charities for the blind which operate quite separately from them and often in competition. Some charities provide free and paid for advice and guidance, consultancy and products such as AT for example. Some charities exist to fund projects which may be AT related, some fund equipment. Some work on a national, regional and local basis and some in just one of these arenas.

The problem is that there might be support available but it is very difficult for the end user to navigate this segment. With 180,131⁷⁶ charities listed in the register of charities, competition for donations is fierce and funding tight so even if a disabled person is aware of the options it is often difficult to fulfil the funding criteria and support may go only to the very needy to the exclusion of those who have a real if lesser need. Given the difficulties that end users may encounter when finding out what is available, it is possible that even the very needy may be missing out.

Go ON UK⁷⁷ - is a charity set up to get the 16 million people in the UK who still do not have the basic IT knowledge to send an email, use Google or buy their shopping online. In the Booz report (2012)⁷⁸, commissioned by the charity, it is stated that there is a potential uplift in UK GDP of global digital leadership is achieved. This is dependent on overcoming the barriers to increasing usage. AT can contribute to the number of people being able to get online (accessing in the first place) and the quality of that interaction.

Go ON Gold⁷⁹ - is a national campaign, and is a Go ON UK partner project to raise awareness about the barriers faced by disabled people in accessing computers and the Internet, and to help remove those barriers. There are links to a range of resources including success stories, 'what's in it for me?' and resources to help people to get online, and adapt their computer, phone or other technology to suit their needs.

⁷⁵ The Internal Market for Assistive ICT Report (2011)
http://ec.europa.eu/information_society/activities/einclusion/library/studies/docs/final_at.pdf
<http://www.abilitymagazine.org.uk/Articles/Article-253-3.aspx>

⁷⁶ Charity Commission <http://www.charity-commission.gov.uk/showcharity/registerofcharities/SectorData/SectorOverview.aspx>

⁷⁷ Go ON UK <http://www.go-on.co.uk/>

⁷⁸ Go ON UK http://www.go-on.co.uk/files/2113/5237/0908/The_Booz_Report_Nov2012.pdf

⁷⁹ GoON Gold <http://www.go-on-gold.co.uk/>

6.8 AT Awards

The Technology4Good Awards celebrate the hard work of people of all ages who use the power of computers and the internet to make the world a better place. They were created by AbilityNet, working with BT and a range of commercial and not for profit partners and sponsors (including, in 2013, BATA).⁸⁰

“The UK assistive technology industry is one of the most innovative in the world and this award will encourage more developers to design for disabled people.” (Ability Editor, John Lamb, 2013).

There is also a BETT SEN Award given each year. Past winners have included AT software suppliers

Mainstream awards (e.g. IMS Global Learning Impact Awards and The ALT Learning Technology Team Award) sometimes include AT related awards.

6.9 Conferences and exhibitions

UK AT/Assistive ICT is usually well represented at international conferences and exhibitions such as those listed in the Kellogg report, for example, such as Human Factors in Computing (CHI), International Conference on Computers Helping People with Special Needs (ICCHP) as well as CSUN Assistive Technologies Conference. In the UK the main conferences and exhibitions include the BETT SEN sector with 146 exhibitors listed for 2013 and E-Access 13: Technology for All as well as Naidex. There is no assistive ICT specific international conference hosted in the UK but the Enable conferences mentioned in section 7.3.3 are a move in the right direction.

6.10 Government

6.10.1 Funding for assistive technology

Sources of government funding for assistive technology in the UK depend on different circumstances and criteria, but are generally grouped into three categories: at work, in education and at home.⁸¹ Access to Work, DSA and other funding for AT for education has been briefly addressed above. In January 2011, the UK Government's Home Access Scheme, which was the only source of public funding for Accessible ICT and AT for Disabled People in their personal lives reached its quota and is now no longer available.

⁸⁰ Technology4Good <http://www.technology4goodawards.org.uk/>

⁸¹ Action for Blind <http://www.actionforblindpeople.org.uk/resources/practical-advice/assistive-technology-resources/funding-for-assistive-technology/>

6.10.2 Funding for projects and innovation

The Government funds projects such as SBRI and directly or indirectly some AT projects in education and these have been addressed above under 6.7.

6.10.3 Campaigns and Initiatives

As the Government moves toward its goal of fully 'Digital By Default' transactional services by 2015,' it is important to ensure that the hardest to reach, and particularly older people, are not left further behind by channels placed out of their reach and beyond their current capability', (ND 2012).⁸² The people the Government is aiming this initiative at are in the main those who are not entitled to funding for AT.

6.10.4 Legislation

There is limited legislation relating to AT/Assistive ICT and is largely indirect. The Equality Act (2010)⁸³ is aimed at ensuring that disabled people can access services and information without discrimination. The Communications Act (2003)⁸⁴ gives Ofcom the power to regulate service providers in their provision for disabled customers (e.g. emergency services must be available by SMS message). A survey conducted in 2011 of 350 central government websites showed that none reached this standard on every page (Nath, 2012).⁸⁵ The UK has no law enforcing the procurement of accessible goods in the public sector whilst the USA for example does.

In the international arena, in 2009 the UK ratified the UN Convention on the Rights of Persons with Disabilities⁸⁶. The convention mandates that access to education and to technology (among other things) are ensured for all disabled people without discrimination and specifically mentions that ICT accessibility and availability must play a part in this. There is also the EU Citizen's Right Directive (2009)⁸⁷ which states that disabled users should have the equivalent access to services as other people have.

7. European Aspects

There are a number of projects and initiatives at European level, and at quite a large scale involving networks of organisations sometimes up to twenty in number and

⁸² ND2012 <http://www.slideshare.net/GoONND2012>

⁸³ The Equality Act (2010)⁸³ <http://www.legislation.gov.uk/ukpga/2010/15/contents>

⁸⁴ The Communications Act 2003 <http://www.legislation.gov.uk/ukpga/2003/21/contents>

⁸⁵ Nath, C. (2012) ICT for disabled people [Online]. Parliamentary Office of Science and Technology, POSTnote 411. Available from <http://www.parliament.uk/briefing-papers/POST-PN-411>

⁸⁶ UN Convention on the Rights of Persons with Disabilities
<http://www.un.org/disabilities/convention/conventionfull.shtml>

⁸⁷ EU Citizen's Right Directive (2009)
<http://www.europarl.europa.eu/sides/getDoc.do?language=EN&type=IM-PRESS&reference=20090401IPR53200>

significant funding which can range from a few thousand to millions of pounds. One issue for the UK AT/Assistive ICT sector is that there is a great effort to make sense of the AT landscape at international level when there is limited consensus, understanding and consolidation at national level. An example of this relates to databases of AT products, services and projects. Finding information is difficult in the UK, so if end users can visit a European database which does not include the UK and easily find information there, they might well choose to purchase products from elsewhere in Europe. By the same token, end users from outside Europe are able to find UK based products but only, of course if they are in the database.

7.1 Reports

7.1.2 Analysing and Federating the European Assistive Technology ICT industry - final report (2009) ⁸⁸

The global objective of the study has been to gain information as to the state of the EU AT ICT industry and develop conclusions and recommendations to what steps can be taken to improve the competitiveness of the companies which form this industry. The report was co-written by the Association for the Advancement for Assistive Technology in Europe (AATE)⁸⁹ which has a mission to "to stimulate the advancement of assistive technology for the benefit of people with disabilities, including elderly people."

The report concludes that the AT ICT industry in the EU is not a simple one. It is complex in various aspects, for example the large number of products and small firms, and for the different service provider systems that are used to get AT/Assistive ICT products to disabled end-users.

The report identifies challenges for AT companies which include:-

- a. 'How to get the right product, via the right person, and with the right instructions and training to the disabled end-user who needs it. To some extent, this is a distribution and marketing challenge common to any industry, but in the AT ICT [term used in the report] industry in Europe, the complexity of the different service provider systems is an extremely potent force in the marketplace.
- b. The never-ending pace of ICT, including the basic problem of merely trying to keep up with the technology, is made much more complicated by the small size of AT ICT firms compared to the multinational ICT firms setting the pace.
- c. An additional force of change in the industry is coming from standardisation, universal design, and mainstreaming. these trends offer plenty of opportunity for

⁸⁸ EPractice.EU

http://ec.europa.eu/information_society/newsroom/cf/document.cfm?action=display&doc_id=606

⁸⁹ Association for the Advancement of Assistive Technology in Europe <http://www.aate.net/?q=node/25>

companies, but this also will result in new competition to some AT products from new, more accessible mainstream products.

d. Potential market size, more companies are incorporating accessibility into their products and services. In some aspects, these trends offer plenty of opportunity for companies, but this also will result in new competition to some AT products from new, more accessible mainstream products.

e. Universal Design and mainstream products and services will continue to be promoted, both because of end-user interest but also because of public policy that dictates accessibility. This however, will not mean the end of the AT ICT market. It may mean that some products or services disappear, or that a solution is made obsolete, but that is business and industry evolution. For companies that take an active role in looking for opportunities there will continue to be a market, especially in products and services related to ICT.'

The overarching conclusion is, that 'the European AT ICT industry is likely to stay a challenging one. However, there is a relatively easy action that can be taken, that seems to have potential for better organizing and supporting the competitiveness of the EU AT ICT companies: form an EU AT ICT industry association.' (See reference above to IAAP as a new step towards something on similar lines.)

7.1.2 The Internal Market for Assistive ICT Report (2011)⁹⁰

The main research question for this report is, "What are the main barriers and opportunities today in the European Internal Market for assistive ICT, and what could be gained in terms of economic and social impacts derived from addressing barriers and embracing opportunities in the market for assistive ICT?"

The Deloitte report sets out strengths and weaknesses of the assistive ICT landscape in the UK and it is worth including them here (and are in italics), a commentary on each point is provided and additional points are made:-

Strengths

a. There is a recognition in policy, practice and public awareness that computer assistive technologies can offer a real opportunity for improving the lifestyles of disabled people and for maintaining independence; This has been evidenced in section 6 of this report, for example in terms of government initiatives, funding, projects, employer initiatives and charity and third sector activity.

b. Provision in HE and the workplace gives full cost coverage of assistive ICTs and some freedom of choice to those that are aware of the schemes; DSA is a

⁹⁰ The Internal Market for Assistive ICT Report (2011)

http://ec.europa.eu/information_society/activities/einclusion/library/studies/docs/final_at.pdf

world class gold standard initiative with trained assessors but could be in danger of becoming over-complicated with a range of bodies involved. Access to Work has the potential to be an initiative with great impact but there is limited awareness of it and insufficient funding of equipment.

c. Specialist equipment services (National Healthcare Service) provide hubs of expertise and equipment to people with complex disabilities; In terms of this report, this could relate to communication aids rather than the wider assistive ICT landscape.

d. There is a Competence Framework for Trusted Assessors which was published in 2005.⁹¹ It is not clear what impact this has had if any on the professionalism of the workforce and on competence levels. However whilst there are trained assessors with up-to-date knowledge, there are many more people working in this field who have limited knowledge and expertise. This will generally be through no fault of their own but rather because AT is only part of their role and/or they have limited time for that aspect. If these gatekeepers to a world of assistive technology - which can enable independence, meaningful employment and opportunity - lack knowledge of all that is currently available, how to source and fund it, then those in need are not being well served.

Weaknesses

a. Provision of assistive ICTs is patchy and inequitable often dependent on regional priorities and availability of services. There is a lack of consistency of support and funding for the end user throughout their lifetime and depending on what they are doing, for example if they are studying or working or unemployed or retired. This may well depend on where they live and it will certainly depend on what they know or what whoever is supporting them knows.

b. There is inadequate documentation of outcomes for the efficacy of assistive ICTs. Statistical information on the use of assistive ICTs is not generally available. There is simply not enough known about what AT/Assistive ICT is (at least this is not widely agreed); who is involved (commercial, third sector) and what the products are.

There is no central database/point of information (of products, services, projects) - this is concerning when there are European initiatives driving centralised repositories of information. This will disadvantage UK AT businesses since they are insufficiently represented in Europe.

c. The market has been seen by some distributors and manufacturers to be restricted by assessment services that produce affiliation and exclusive

⁹¹ A Competence Framework for Trusted Assessors
<http://www.cot.co.uk/publication/books-z-listing/competence-framework-trusted-assessors>

relationships with set suppliers. If an assessment centre uses a particular supplier then it is limited to products that the supplier carries or represents. Related to this is that if some assessors do not have the capacity to research the range of products and keep up to date, then they will recommend products that they are already familiar with. In addition, assessors may be assessing end users in areas that they are not expert and particularly if the end user has more than one disability.

In this Deloitte report, the following requirements are identified and recommendations made, in terms of moving the AT/Assistive ICT agenda forward in Europe,-

- Defining disability - there is a clear need for a common and consistent definition of disability in order to gather statistics comparable in the EU.
- Defining use - there is a clear need for a common and consistent data on disabled people and their ICT use, including AT/Assistive ICT.
- Defining the market:-
 - There is a need for data on European Member State expenditure and reimbursement for AT/Assistive ICT. The outcome of this analysis should include figures on expenditure per disabled person and per type of impairment and type of AT/Assistive ICT solution.
 - There is a need for an extensive survey of market players in the AT/Assistive ICT market.
 - There is a need to assess the second hand market for AT.
- Setting up of information centres. *'The amount of actors involved in service delivery across life environments and across regions creates a complex reality for both people with a disability and assistive ICT companies that need knowledge of the specific organisations and need to invest time to navigate the system.'*
- Harmonising lists of eligible products. *'A set of guidelines should suggest EU Member States harmonise their lists of eligible products. A common EU list of categories of products should be established.'*
- Providing on-line information based on common taxonomy. *'The internal market is highly fragmented and no single taxonomy of assistive ICT products exists. The existence of several national databases and the different approaches to categorise assistive ICT is symptomatic of this phenomenon.'*
- Empowerment of users. *Companies may become more incentivised to tailor information provision and pricing strategies towards their actual consumers rather than towards procuring organisations. Can help promote policy initiatives towards improving general digital literacy both with mainstream and AT products.*

7.2 Funding Streams for research and development

European funding is available for UK AT research and development from a number of funding streams which include:-

Framework 7⁹² - as part of a €10.8 billion budget for research and innovation agreed for 2013, the European Commission has announced an €8.1 billion euro package of calls for proposals under the EU's Seventh Framework Programme for Research (FP7). There were 45 AT projects funded under FP7 listed in the FAST 2011 Report.

The Lifelong Learning Programme⁹³ covers Comenius, Erasmus, Grundtvig, Leonardo da Vinci, Multilateral Projects, Networks, Accompanying Measures and the Transversal Programme. This funding (around £30K per partner) is much less than the FP7 funding (often in the millions). The projects can be searched in the ADAM database. It is not easy to estimate from this how many of these projects are taking place in the UK and which relate to AT but it is estimated that this could be around 100.

7.3 Databases of Assistive Technologies

There has been a move via a number of European projects towards creating a collective database of assistive technologies. These projects are ETNA, Eastin and ATis4All and are described below:-

7.3.1 ETNA

ETNA (European Thematic Network on Assistive Technologies) network involving 23 leading Institutions in 13 Countries. It has been working since 2011 to establish a web portal of ICT-based assistive technology products, accessibility solutions and related services. One of its main outputs in collaboration with Eastin is the Eastin web portal/information system described below.

7.3.2 Eastin

The Eastin (European Assistive Technology Information Network) website is 'an easy-to-use tool that opens the door to several national databases at the same time, so you can look up the information you require and have it immediately translated into your own language, where necessary.

You can analyse, compare and choose the best and most up-to-date solutions for your needs. You may be a user of AT or a family member; you may advise clients as a healthcare professional or work in an ever expanding industry as an engineer or manufacturer.'

⁹² CORDIS http://cordis.europa.eu/fp7/home_en.html

⁹³ Lifelong Learning Programme
http://eacea.ec.europa.eu/lfp/funding/2012/call_lifelong_learning_2012.php

The database uses the ISO9999:2011 international classification of assistive products as mentioned in section 2. It also uses the International Classification of Functioning, Disability and Health (ICF)⁹⁴ On the key word search for example it is very difficult to separate out assistive living technologies from assistive ICTs and a user can easily be overwhelmed with choices and would need to have a very clear idea of what they were searching for.

The DLF⁹⁵ is a founding member of Eastin and as noted above they have an AT database which is subscription only and designed for professionals. The DLF database feeds into the Eastin database. Emptech does not feed into the Eastin database because it does not utilise ISO codes.

7.3.2 ATIS4all

ATIS4all⁹⁶ (Assistive Technologies and Inclusive Solutions for All) is closely related to the Eastin project in that it will provide Web 2.0 participation tools in order to encourage online discussion exchange of knowledge and expertise, and sharing of information among key actors and end users.

7.3.3 ENABLE

The ENABLE⁹⁷ European project started on the November 1st 2011 and runs for three years until the end of October 2014. A network of 16 European Partners and four third country partners will develop the EU wide platform to gather information and investigate how ICT is currently used to support lifelong learning by disabled adults and how it could best be used to overcome barriers and increase opportunities. The collaboration with overseas countries Australia, Korea and India will provide worldwide perspective. It will provide a database of around 200 assistive ICTs.

The project is led by the Slovenian partner. There are two UK partners which are the University of Glasgow and Jisc TechDis. The University of Glasgow's responsibilities include organising a one day International Conference on Using New Technologies for Inclusive Learning in August 2013. The international conference will be repeated in June 2013 but as a two day, partly face to face and partly virtual conference organised by Jisc TechDis who will also be co-ordinating the creation of an in-service training course on using ICT to support disabled adult learners.

8. Conclusion

Having explored the AT/Assistive ICT landscape in the UK and examined the challenges it is now possible to consider the purpose of this research and to comment on the extent to which the objectives have been achieved:-

⁹⁴ International Classification of Functioning, Disability and Health (ICF)
<http://www.who.int/classifications/icf/en/>

⁹⁵ DLF <http://www.dlf.org.uk/>

⁹⁶ ATis4All <http://www.atis4all.eu/>

⁹⁷ Enable <http://i-enable.eu/>

a. To establish the scope of the assistive technology (AT) sector in the UK

Defining what is meant by AT was fundamental to identifying and understanding the landscape. The term AT is sometimes taken to include medical devices and in many respects this aspect seems to overshadow assistive ICTs. This is shown by the FAST database and the DLF and Eastin databases for example. Assistive Technology needs to be established as a term and as a sector or at least a segment. This would recognise its importance to the end user and prevent it being subsumed under mainstream computing or wider medical and education aids.

Once the definition to be used was decided on, it was then possible to start to map out the landscape as set out in Appendix 1 and described in section 6. The mapping is not yet complete – in such a fast-changing environment, it probably never can be - but goes some way to identifying the different areas and enables some consideration of overlap and identification of gaps.

b. To establish its scale in terms of employment (number of jobs) and the range of expertise and experience involved

The mapping exercise was clearly useful in terms of identifying where people might be employed in an AT/Assistive ICT role. As can be seen, this was diverse, including those involved in research and development, manufacturing, supply, assessment, sales, professional support in education, health and third sector organisations. However at every turn there have been difficulties with numbers being dependent on estimates and experience and knowledge of specific areas and as a result only a rough estimate has been possible. Even so, that there is a sizeable sector is clear.

c. To establish its value to our economy (in terms of GDP)

Since it has been difficult to establish the number of enterprises and therefore the number of employees, as well as not being able to identify the number of beneficiaries, it has only been possible to give a very rough estimate. However some data was available and gaps in the data and how these challenges might be addressed have been identified.

Taking into account the above difficulties it was possible to estimate that there are around 1,500 products available, 1000 business entities, 10,000 employees (with many more employed with AT as just part of their role) and an estimated contribution to GDP of around £ 70bn. (See the relevant sections of this report for how those figures were arrived at and some essential caveats.)

9. Recommendations

While it is outside the remit of this initial review of the sector to make specific recommendations for action, it is worth drawing attention to the recommendations (above) put forward by the two European reports mentioned in this document as there is much in them that makes sense for the UK as well. If the UK AT sector wishes to align itself with European initiatives then it needs to consider how best to implement those recommendations.

An overarching recommendation was that an EU AT ICT association be formed. The UK's British Assistive Technology Association (BATA), and the recently formed, US led, International Association of Accessibility Professionals (IAAP), show steps are already being taken to join up the sector in this way but it is still early days and much needs to be done.

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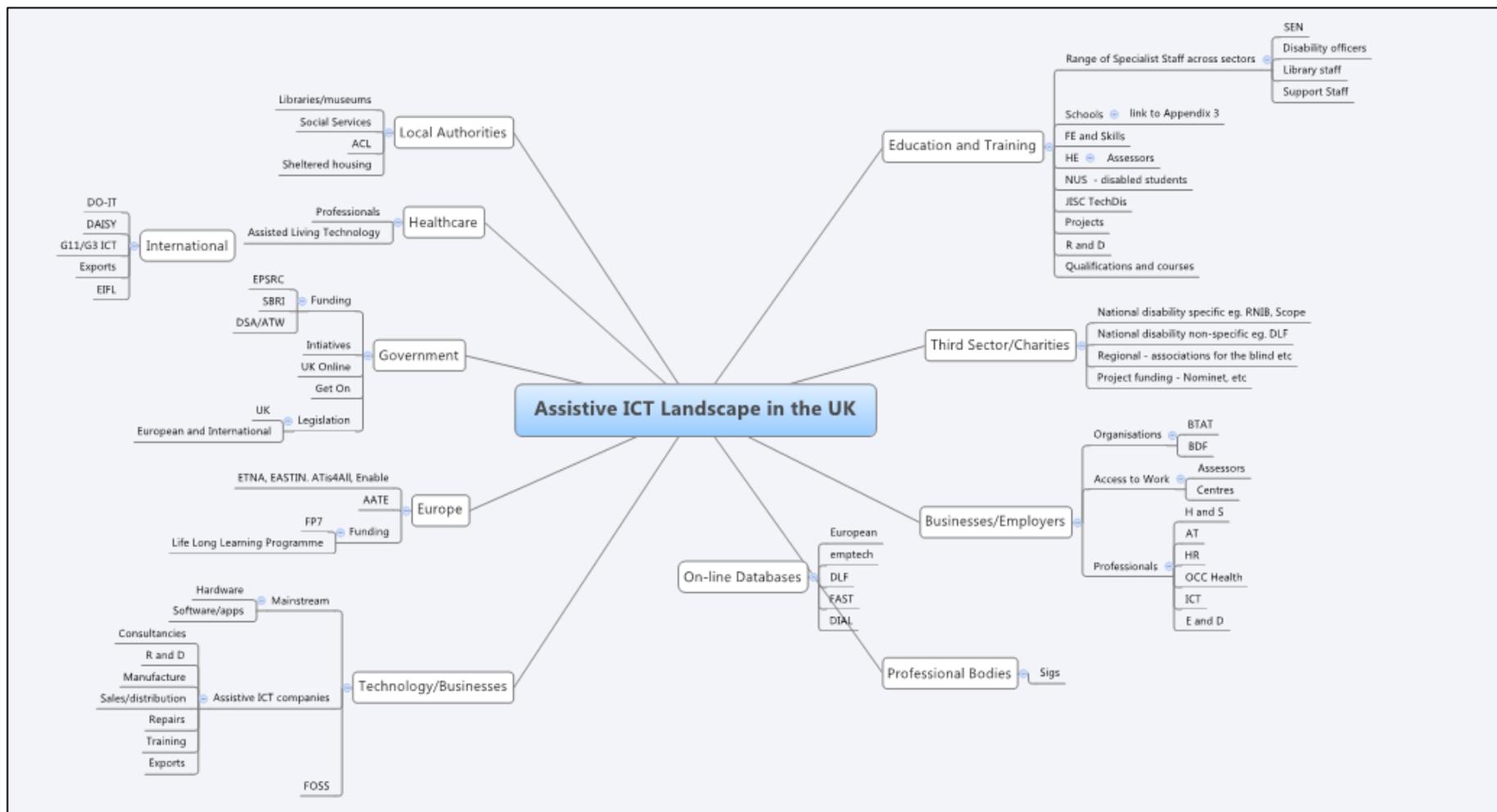
Appendices

Appendix 1 – Assistive ICT Landscape in the UK

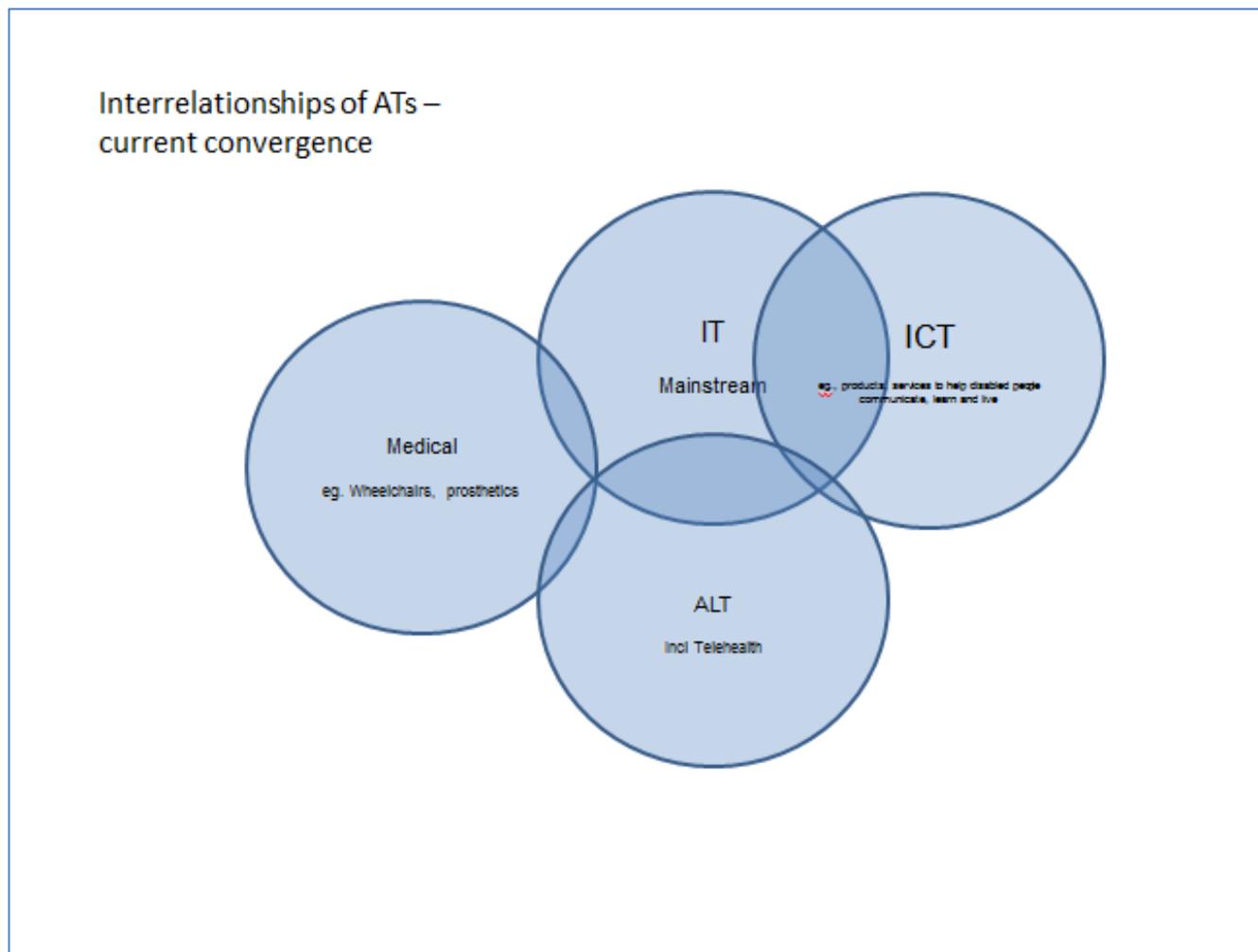
Appendix 2a – Interrelationships of ATs – current convergence

Appendix 2b – Interrelationships of ATs – future convergence

Appendix 1 – Assistive ICT Landscape in the UK



Appendix 2a – Interrelationships of ATs – current convergence



Appendix 2b – Interrelationships of ATs – future convergence

