Digitisation and reformatting: recommendations from current provision in Scottish higher education
This report is based on research by Andy McMahon, University of Dundee, Carol Howieson, University of Strathclyde, Darren Matheson, University of Stirling and Paresh Raval, University of St Andrews.

The project team would like to thank ATANET (network of assistive technology advisers in higher education in Scotland) for the essential support, knowledge, expertise and encouragement members have provided throughout this research, and the institutions that contributed to this research:

- University of Dundee
- University of St Andrews
- University of Stirling
- University of Strathclyde
- University of Aberdeen
- The Open University

The team would also like to thank the heads of disability services in Scotland group, who were critical readers for this report.

Further information

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1 Introduction

‘If I can’t read it, I can’t learn it’
(RNIB-registered student)

Disadvantage may arise where learners experience barriers to reading. Some students have impairments that make printed documents inaccessible, therefore accessible electronic texts are vital to enable these students to become independent learners.

Approaches to provision of accessible electronic text vary across the Scottish higher education sector. Following a change in the funding system for digitisation and reformatting in higher education in Scotland (explained further in the financial management section of this report), Scottish institutions now have responsibility to fund this work themselves, and may experience technical challenges as well as pressures to reduce costs and increase efficiencies. To avoid inequality in provision for students across different institutions, collaboration and sharing information on effective organisational processes and technical standards for digitisation and reformatting will be important.

This report presents examples of practice and recommendations for developing provision of accessible electronic text, with a focus on digitisation and reformatting. Evidence is drawn from current services in place at four Scottish higher education institutions (HEIs) which offer different solutions to provision and have diverse administrative, student and research profiles. These institutions are:

- University of Dundee
- University of St Andrews
- University of Stirling
- University of Strathclyde

This is supplemented with different approaches identified through a survey of the Scottish higher education sector that received four responses, including from:

- The Open University
- University of Aberdeen
Who should read this report?
The report is intended to provide information relevant to a range of services, departments and individuals within an institution, particularly:

- senior managers, directors of IT and library services, and financial planners for information on management and financial requirements and where cost efficiencies can be made in provision

- equality and diversity practitioners and disability advisers regarding potential inequalities and relevant effective practice recommendations

- institutions wishing to enhance or considering implementing digitisation and reformatting provision including a range of general options for provision to be considered alongside institution-specific factors

Methodology
This report, and the recommendations within, are based on the findings from:

- institutional evidence from the participating HEIs

- a sector survey to collect additional examples of practice

- peer reviews within the working group to identify key elements of successful in-house digitisation and reformatting services

The working group was made up of alternative formats specialists from the four participating HEIs and Equality Challenge Unit (ECU).

Legal context
Under the Equality Act 2010 and the United Nations Convention on the Rights of Disabled People 2009, HEIs are required to provide equal and timely access to information for all people.

Alternative format provision, including electronic text, for students falls under the duty to make reasonable adjustments contained in the Equality Act 2010. The intention of this duty is to give disabled students access to education as close as is possible to the standards offered to students at large. In practice, this means HEIs are required to make reasonable adjustments
Introduction

To provisions, criteria and practices that put disabled students at a substantial disadvantage compared with their non-disabled peers. In the context of alternative format provision, HEIs are required to consider how they can enable students with a range of impairments to use printed texts so that they have access to the same study materials as their non-disabled peers.

Alongside a duty to make individual reasonable adjustments, HEIs are required to consider anticipatory adjustments for students. This means that service providers must plan ahead and take a strategic approach to alternative format and electronic text provision so they have systems in place that can be activated as appropriate for their students.

www.ecu.ac.uk/publications/managing-reasonable-adjustments-in-higher-education

The Copyright (Visually Impaired Persons) Act 2002 (which amends the Copyright Designs and Patents Act 1988) introduces some exceptions to copyright law to enable 'accessible' copies of documents to be created without prior need for permission from the author(s) of the documents.

RNIB provides further information on its website.
www.rnib.org.uk/getinvolved/campaign/accessstoinformation/copyrightcampaign/Pages/Copyright_Act_2002.aspx
Terminology

The terminology used in this publication follows the social model of disability, which views environmental, physical, structural and attitudinal barriers to be disadvantaging – or disabling – for people with impairments.

Students requiring accessible electronic texts can have a variety of impairments including visual impairments, physical impairments and dyslexia.

Accessible electronic text

Digitisation, reformatting, alternative formats and transcription are among the terms used by institutions in reference to the process of preparing accessible electronic text.

- **Electronic text**, depending on its delivery, can be copied, pasted, searched and edited. It is customisable to suit the print requirements of the reader, so that the typeface, size and colour can be changed, it can be read by screenreading and text-to-speech software and can be used to provide large print and braille copies.

- **Digitisation** is the process of taking a paper resource, such as a book or journal, and scanning each page to create an electronic page image. The page image will be an exact representation of the source page and its text can be sight-read but will not be readable by screenreaders.

- **Optical character recognition (OCR)** is the process used to convert image text within the page to electronic text.

- **Proofreading**, in this context, is the process of correcting recognition errors. This includes misrecognition of text typically identifiable as misspelled words, but can also include layout issues where columns of texts have been recognised as a single block of text, or content issues where elements have been recognised as a picture element rather than as table. The degree of proofreading required will depend on the quality of the source image, complexity of the content, page layout and the degree of accuracy required.
= **Reformatting** is the process of rendering otherwise unreadable text elements readable, for example, converting a table that would otherwise be too complex to read into a list, or by providing alternative text for equations. The degree of reformatting applied will depend on the intended reader’s print requirements.

= **Adaptation** is the process of ‘adding value’ by adding textual representation of the non-text elements, for example by providing descriptions or alternative text for images and charts. The degree of adaptation applied will depend on the intended reader’s print requirements and the content significance of the non-text elements.

**Other terms**

= A **non-medical personal helper (NMPH)** is a person employed to help disabled students undertake study-related activities that they find difficult as a result of their impairment, such as notetakers or scribes, proofreaders and dyslexia tutors. NMPHs are funded through the student’s individual disabled students’ allowance (DSA) or directly by the institution.
2 Summary of approaches

Each of the participating HEIs has a different approach to providing accessible electronic texts that is specific to the institutional context. The approaches developed are summarised below.

Further details are available on the ATANET website.
www.atanet.org.uk

University of Dundee

The university has recently completed a two-year pilot project that investigated the feasibility of making alternative formats, including accessible electronic texts, available in-house. The project has now led to the establishment of a document standardisation and alternative formats service which has three core objectives:

- to develop and distribute university-wide accessible Microsoft Office templates, which meet the requirements of people with impairments that make printed materials inaccessible
- to establish a service to convert on-demand and historic material into alternative formats
- to develop targets and an information strategy to ensure the purchase of accessible information resources

The service has acquired extensive knowledge of producing alternative formats from its involvement in the project, and has established a long-term workspace and equipment room to facilitate production. The process for identifying students, volunteers and converting material is currently being developed. A 0.5 full-time equivalent IT specialist secondment and an internship has been secured to support this process during its first year of operation.
University of St Andrews

The university’s alternative format suite was established in 2004 to produce in-house alternative formats, including accessible electronic texts, in response to expensive outsourcing. The alternative format suite has a pool of volunteers and aims to produce a ‘one-style-fits-all’ flexible electronic format which can then be used to provide braille, human audio and synthetic voice, and large print. It has the benefits of being:

- accessible
- error free
- easily navigable
- suitable for independent study

University of Stirling

The University of Stirling is committed to providing, as far as possible, completely accessible reading materials to all its students. In 2004 the need for in-house individual formatting was identified when it became apparent that standard electronic formats, such as basic Word or PDF, did not offer the flexibility to make particular content accessible to some disabled students.

The intention of the alternative format service is to provide a ‘one stop shop’ for reformatting for students and the academic staff who teach them.

The student-centred service bases its approach on individual assessment of reformatting needs. Each supported student is assessed and a format is created based on their agreed requirements, the needs of the student and the requirements of their course. It is designed to allow independent working and a fast effective turnaround of accessible texts.

The service employs a high degree of flexibility in order to make documents as accessible as possible and alters reformatting techniques if the status of a student’s impairment changes.
University of Strathclyde

University of Strathclyde’s central scanning service was established in 2007 to process digitisation requests from academic departments, to enable accessible electronic material to be posted on the university’s virtual learning environment, and to enable academic departments to provide accessible copies of the required course reading for visually impaired and blind students.

The service spans the academic departments, library, scanning team and disability service, and is underpinned by a bespoke information system that tracks all jobs. The service provides solely for students covered by the Copyright (Visually Impaired Persons) Act 2002 and therefore is for people who are visually impaired, blind or physically unable to page turn or carry a standard book.

The wider group of students whose impairments make printed materials inaccessible are supported by on-campus access to training and resources to independently prepare their reading materials. Since its launch, the service has adapted its provision to meet an increase in student demand and a variety of visual impairments.

The Open University

The alternative formats team within disabled student services has offered four main alternative formats of standard material since the 1980s:

- books with a spiral comb-binding so that they lie flat
- digital accessible information system (DAISY) recordings (audio substitutes for print material)
- PDF files of print material
- transcripts of audio-visual material

These alternative formats are created in anticipation of students requiring them on all modules created by the university where relevant (except DAISY where there are more limitations on resources). PDF files and transcripts are automatically created when teaching and module materials are made. The formats are
advertised and students can register for a qualification knowing in advance what alternative formats will be available for each module.

Since autumn 2010, the university has also been developing accessible electronic texts for use on all taught modules. These are ePub (ibook and mobi ebook), MP3 and Word. The service is currently piloting modules using these formats and will have the ability to mainstream production for all modules in 2012.

The Open University is unique among the HEIs involved in the research in that its courses generally use in-house teaching and module materials. The university’s service model is therefore quite different to the others presented in this report. However, there will be transferable learning from the processes and practices the university has developed which may be valuable to institutions seeking to set up or develop a service.

**University of Aberdeen**

The University of Aberdeen does not have a standalone alternative format service but delivers alternative formats through the combined input of disability advisers, assistive technology advisers and members of a pool of NMPHs funded by the institution. In-house material is provided in accessible formats directly by academic schools, with guidance from assistive technology advisers where necessary. For external material, disability advisers liaise with publishers where whole texts are required and/or assign production work (eg scanning and transcribing into braille) to appropriately trained NMPHs. Assistive technology advisers oversee the technology on which the work is done and provide training to the NMPHs.

Alternative format technology is also available within the mainstream IT provision on campus in computer classrooms and assistive technology booths, so individuals are able to use such facilities independently. The university also assists students to obtain audio books where commercially available. However, in terms of creating accessible formats for students for high volumes of material, this is only done for students who are covered by the Copyright (Visually Impaired Persons) Act 2002.
3 Developing an in-house digitisation and reformatting service

Service model

Service models and management vary across HEIs. Some institutions have a specific alternative format service that undertakes digitisation and reformatting work while some embed provision into another service area, such as the disability service, library or student services. Some models provide internal expertise to produce formats in-house while others outsource production.

Service management

The four participating HEIs have all established specific digitisation and reformatting services and have an alternative format specialist who acts as a central point of contact and manages the service. They found that this model provides expertise that has been particularly beneficial in the early stages of establishing a service and in providing guidance and support on an ongoing basis. This includes:

- an in-depth and up-to-date understanding of the technical process of converting material from its original source to a suitable accessible format
- knowledge of how impairments can impact on accessing academic text and how assistive technologies operate when used to access non-standard content
- the ability to coordinate and understand the workflow to ensure smooth running and timely delivery

Some institutions have established management structures to oversee their services.

The University of Strathclyde has a scanning service committee including members from information governance and compliance, research and learning support, the library service and assistive technology team.

Several of the survey respondents said that their institutions do not have dedicated services and managers, but embed the process in other service areas, such as the disability or library service. Where institutions do not have an in-house specialist, they make use of external sector expertise. Some use assistive technologists who are members of ATANET (the professional body of assistive technology specialists across Scotland) to support the alternative formats process.
Digitisation and reformatting process

The diagram below shows the typical workflow and the range of staff that could be involved in the digitisation and reformatting process depending on the service model chosen. The steps in the process vary depending on the format of the original source material and the format it needs to be delivered in, however the key stages outlined will be relevant for most texts.

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<tr>
<th>Stages</th>
<th>Staff involved</th>
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<tr>
<td>Identification of need</td>
<td>Disability adviser</td>
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<td>Recommendations of format required</td>
<td>Admissions and registry</td>
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<td>Lecturer</td>
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<td>Identifying and prioritising reading and materials list</td>
<td>Assistive technology specialist</td>
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<td>Disability adviser</td>
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<td>Checking an accessible copy can be sourced</td>
<td>Academic</td>
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<td></td>
<td>Alternative formats specialist</td>
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<td></td>
<td>Disability adviser</td>
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<td></td>
<td>Library staff</td>
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<td>Assistive technology specialist</td>
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<td>Non-medical personal helper</td>
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<td>Student</td>
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<td>Alternative formats specialist</td>
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<td>Alternative format specialist</td>
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<td>External provider</td>
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<td>Supervised volunteers</td>
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<td>Non-medical personal helper</td>
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<td>Assistive technology specialist</td>
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<td></td>
<td>Librarian</td>
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September 2012
With the numbers of staff and processes involved in delivering accessible electronic text, effective information management is important. Institutions have different methods and systems in place, and some find database information systems particularly helpful.

The **University of Strathclyde**'s central scanning service uses a bespoke database in its coordination of all stages of the workflow from ‘request’ through to ‘delivery to student’. Some direct benefits include the ability to:

- access the database at any time to record and monitor workflow
- view up-to-date information for each job, which is particularly relevant during shift changeover periods

The **University of Stirling** uses SITS information management software for early identification of students who may benefit from the support of the alternative formats service. Students and potential students are then introduced to the service ahead of arrival, allowing for early assessment of individual reading need, and identification of the required module reading. The objective is to ensure that, as far as possible, the students have access to their reading in a suitable format as soon as they commence their course. This also minimises bottlenecks at the start of each semester.
Delivery of accessible electronic texts to students

Institutions have developed different systems and practices to optimise delivery of accessible electronic texts to their students.

The University of Strathclyde hosts the scanning service database on a network space that provides students with secure access to reading materials in their individual book folders. This space is managed by the disability service which creates the students’ book folders and directs the students on how to access their folders. Access is available through the university staff and student information portal on and off campus.

The Open University’s alternative format team makes electronic material available to all students on its website as PDF files.

In-house and outsourced production

The four participating HEIs have developed in-house digitisation and reformatting production after finding outsourcing to be more costly and less flexible. Issues experienced with outsourcing include:

- insufficient subject-specific knowledge for some academic texts
- insufficient expertise for some students’ specific requirements
- longer production times
- restrictions on altering or changing the requirements part way through production
- inflexible end-products

Outsourcing may be expensive and often only covers the scanning and alternative format process, not the resource required to assess the student’s requirements, manage the reading list and deliver to the student. The participating HEIs noted that such outsourcing would only be cost effective in large quantities of repeat material, so may not be suitable for all institutions.
In some cases institutions have found external production helpful in the absence of in-house staff and resources to undertake the work. Some survey respondents reported that they contract transcription and reformatting of course and promotional materials, and sometimes external texts, to agencies such as RNIB.

The Open University usually outsources large print and braille production of large volumes to speed up production. However, it is considering doing more of this work internally when possible.

**Standard electronic formats**

There is a wide variety of accessible electronic formats and different institutions may choose to produce different formats as standard to suit their service model and customer base. For example:

- the University of Dundee produces structured Word documents utilising styles and templates that allow students to rapidly convert the text to fit their requirements following training
- the University of St Andrews produces adapted versatile Word documents and searchable PDF files
- the University of Stirling produces student-specific formats including customised Kesi files (for use with Kurzweil 3000 and Kurzweil 1000), customised Word files, plain text files and PDF files
- the University of Strathclyde produces materials in PDF (image with text underneath) format, capable of Reflow and text-to-speech and Kesi (Kurzweil 1000/3000) format

**In-house production expertise**

To produce accessible electronic texts in-house, institutions require a staffing model that delivers the necessary expertise to produce their chosen electronic formats. Institutions approach this differently, with some employing full- or part-time staff and some establishing pools of volunteers.
Paid reformatters
The University of Stirling has five reformatters who were recruited, trained and managed by the alternative formats adviser. They are responsible for the production of accessible, student-specific reformatted materials that fit specified standards within the timeframe indicated by the alternative formats adviser. At times of peak demand, the team of reformatters can work in excess of 300 hours per month, depending on the volume of material required.

The university has found that it can demand a level of commitment, professionalism, quality of service, consistency and accountability of its reformatters that would be unrealistic to expect of volunteers. It has also managed to retain trained and experienced staff whose expertise is utilised to ensure that the alternative formats service delivers the optimum service.

Volunteers
The University of St Andrews’ alternative format suite has a pool of unpaid volunteers recruited, trained and managed by the service manager. In a working day, the service can have up to six volunteers working per hour. At present, the service benefits from between 40 and 80 volunteer production hours per week.

Volunteers are drawn from across the community and the university. The production process is prepared and organised so that volunteers can come in and continue with any tasks in the production to avoid delays. Volunteers also assist with reading and prooflistening during DAISY digital talking book production. The in-house training is tailored to the individual volunteers and provided on a one-to-one basis or in small groups to develop confidence. Volunteers gain a variety of IT skills, and student services and IT services jointly fund a Christmas party to thank the volunteers each year. St Andrews has found that taking the time to train volunteers can make them reliable and effective. The service has volunteers from a 20 mile radius, and some who have been with the service since it first started recruiting volunteers in 2004.
A volunteer model may not be suitable for all HEIs. There may be limitations to finding a sufficient pool of volunteers within a geographic area which could affect the scalability of the provision of accessible texts.

**In-house technology**

Technology is central to digitisation and reformatting, and the technology used varies across the sector. However, the participating institutions all use the following technology.

**Hardware:**
- standard up-to-date PC equipment
- scanner
- Opticbook book scanners [plustek.com/uk](http://plustek.com/uk)
- Kiosk book scanners
- duplex scanners (scans both sides of the paper and form feeds)
- photocopier with scanning capability
- braille embosser
- PIAF pictures in a flash tactile graphics maker

**Production software:**
- OCR software
  - Omnipage [www.nuance.co.uk](http://www.nuance.co.uk)
  - ABBYY FineReader [finereader.abbyy.com](http://finereader.abbyy.com)
  - ClaroRead Plus [www.clarosoft.com](http://www.clarosoft.com)
  - Read and Write Gold [www.texthelp.com/UK](http://www.texthelp.com/UK)
  - Kurzweil 1000/3000 [www.kurzweiledu.com](http://www.kurzweiledu.com)
- Adobe Acrobat Pro (for editing and creating PDF files)
- Create and Convert (open source software) [eduapps.org/?page_id=10](http://eduapps.org/?page_id=10)
- Nuance PDF Professional (create and convert) [www.nuance.co.uk](http://www.nuance.co.uk)
- EasyProducer Dolphin Publisher (DAISY book creator) [www.yourdolphin.co.uk](http://www.yourdolphin.co.uk)
- Duxbury/WinBraille software for Braille production
3 Developing an in-house digitisation and reformatting service

Student assistive software for reading:

- Microsoft Word
- Kurzweil 1000/3000
- ZoomText magnification/reader
- JAWS and Supernova screenreaders
- Read and Write Gold with PDF Aloud
- DAISY book reader

The institutions noted that, as with all technology, providing ongoing technical and operational support within the institution is essential.

Financial management

As outlined in the introduction, the funding arrangements for alternative format work in Scotland have altered over the past year. Previously, a student’s DSA provided by Student Awards Agency for Scotland could be used to cover the costs of digitisation and reformatting of external materials, and the four participating HEIs and some survey respondents made use of this. This provision was removed from the DSA in May 2011:

‘from academic year 2011-2012, costs for digitisation, transcription and reformatting for all texts (core texts, in-house materials and non-core texts) will not be covered by DSA.’

F. Mejury letter

This means that the funding models for DSA students are in a period of transition in some institutions. At present, several of the HEIs involved in the research fund alternative format production in part from the institution’s disabled students' premium received from the Scottish Funding Council, with the rest covered by core funds. Others, including The Open University, fund alternative format provision wholly from core budgets.
The participating HEIs found that understanding the cost of providing an alternative format service is crucial to enabling financial budgeting. With a wide range of individuals and equipment used across many departments, it can be difficult to reach a close estimate of costs. Centralised financial management can be helpful, as bottlenecks can appear in production when changes in departmental financial priorities occur.

The participating HEIs found it helpful to identify:

- staff costs
- start-up costs: equipment, location costs, training, venue
- ongoing costs: maintenance, software licences, training, operations costs (replacement of de-spined books, printing, consumables), IT costs, equipment replacement
- the comparative costs of in-house and outsourced production

The research suggested that it would be around 50–70 per cent cheaper to provide an in-house service, based on a volume of nine students requiring four 400-page textbooks, ten ebooks to be sourced, and 250 sheets of information. Costs are estimated to be £196,488 from an external provider, which includes staff time to coordinate provision with external suppliers (£13,000). See table below for full costs.

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<tr>
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<th>External costs per item (£)</th>
<th>Internal costs per item (£)</th>
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<tbody>
<tr>
<td>Printed textbook (400 pages)</td>
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<tr>
<td>Sourcing accessible ebook</td>
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<td></td>
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<tr>
<td>Printed loose sheets (leaflets/handouts/examination papers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost for 4 textbooks, 10 ebooks, 250 printed loose sheets</td>
<td></td>
<td></td>
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<tr>
<td>Fixed costs (includes staff and office costs)</td>
<td></td>
<td></td>
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<tr>
<td>Cost for nine students</td>
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Internal costs cover staff costs to produce material. This would be reduced if volunteers are used.
When planning resources to deliver its two-year pilot service, the University of Dundee calculated costs for:

- capital outlay and running costs
- IT equipment and software including two PCs, three scanners, scanning and conversion software, maintenance for software and upgrades
- furniture
- installation costs (moving equipment/furniture, installing network and electrical power points)
- training and professional development (service staff skills training and attending national transcription support events)
- training sessions (delivery expenses)
- design services and external relations costs (to enable departments to achieve a professional finish of documents)
- volunteer recruitment and expenses (basic facilities for volunteers)
- operating costs (e.g., when removing a book spine the cost to replace or rebind the book)
- in-house work costs (payment of casual employees to convert non-academic material such as prospectus, leaflets, magazines, etc., and costs of printing, transcribing to braille, CDs)
Managing legal issues

Copyright

Alternative format services have to comply with copyright conditions. Some copyright-free material can be sourced from the internet and some institutions contact authors directly for permissions. Otherwise, it is necessary to work with publishers to receive permission to produce alternative formats. In general, where the year of production of a title is post-2000, print-ready copyrighted books (e-files such as PDF documents) can be sought from publishers. Where such documents do not exist, publishers can provide permission for in-house production. Several of the participating HEIs highlighted difficulties they had had in obtaining permission in a timely manner, but the picture seems to be improving through institutional efforts.

Once permission is attained, most institutions require the students who will receive the alternative formats produced in-house to sign forms that transfer responsibility to the students to adhere to the copyright condition and not share the materials they receive.

The University of St Andrews’ service has developed good relationships with many publishers who are willing to grant permissions and PDFs of their print-ready copyrighted books (e-files). Students who receive these formats are required to sign a form of responsibility that places responsibility on the students to protect the publishers’ ebooks they receive from the alternative format service. Where files have been delayed, the university negotiates with the publishers to be able to produce temporary in-house versions. The university has had some success with contacting authors directly.
Institutions also need to consider the accessibility of online resources, such as databases, purchased or subscribed to from third-party suppliers. This may be the responsibility of the library service rather than the alternative format service, but is an important part of an institution's work to make texts accessible for all students. Some online libraries provide locked-down PDFs that are not accessible.

The Open University’s library tests the accessibility of major databases and those that provide full text for various types of impairment before subscribing. The platform is tested for accessibility and if the resource provides full text a couple of example journals and books are also tested. The aim is to test databases that are trialled, so that the university is aware of potential accessibility problems before they take the decision to subscribe.

Comments are fed back to suppliers and publishers by the library’s resources team, who know the best people to target. They also provide comments for JIBS (www.jibs.ac.uk), a national group that represents the interests of academic libraries with different suppliers.

The library also provides hints and tips for students about accessibility developed from the testing undertaken. www.open.ac.uk/library/databases-accessibility-issues
4 Creating an inclusive service

Anticipatory approach

As part of standard practice to provide students with a more inclusive higher education experience, an institution will take steps to:

- anticipate potential barriers students may face in accessing its services
- make anticipatory reasonable adjustments to remove these barriers
- set in place efficient mechanisms for anticipating and responding to individual requirements where these are not met by the anticipatory adjustments

In its approach to learning and teaching and marketing and communications, an institution may seek to anticipate and remove particular barriers by providing alternative formats of materials (including accessible electronic texts) and resources such as course materials and handbooks and promotional materials as standard practice.

To ensure that the services providing accessible electronic texts are effective in delivery institutions will need to consider what mechanisms they have in place to understand the requirements of their students, how they work with staff to ensure that students’ requirements are met, and how they communicate their services to students.

Identifying individual requirements

While taking an anticipatory approach may reduce the need to provide alternative formats for individual students, some disabled students will have impairments that require specifically tailored formats, training or assistance to modify existing electronic formats for their own use.

The institutions involved in this research employ an individual assessment approach to identify the specific barriers experienced by each student and their specific requirements. Such an approach may consider:

- what alternative text requirements the student’s impairment necessitates
- the student’s IT capability
Creating an inclusive service

= assistive technology already used by the student and the institution
= student-specific working practices
= module reading structure
= subject-specific teaching methods, linked to the format of the module texts
= the format of the original texts

Identifying alternative format requirements
Accessible text production within the University of Stirling centres on the creation of student-specific formats. Each student who requires alternatively formatted material is individually assessed and the formats are designed appropriately.

Outline of an alternative format assessment

<table>
<thead>
<tr>
<th>Assistive technology used</th>
<th>Methods used prior to university</th>
<th>Training availability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recommendations from needs assessor</td>
<td></td>
</tr>
<tr>
<td>Student’s working practices</td>
<td>Student’s coping mechanisms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preferred method of study</td>
<td></td>
</tr>
<tr>
<td>Complexity of reading material</td>
<td>Frequency of diagrams and tables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphical elements interrupting the flow of the text and disrupting comprehension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the use of colour simply cosmetic or integral to the understanding of the material?</td>
<td></td>
</tr>
<tr>
<td>Module choices</td>
<td>Is specialist input required?</td>
<td>Languages Maths</td>
</tr>
<tr>
<td></td>
<td>Is research part of the module?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online module?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to Succeed material</td>
<td></td>
</tr>
<tr>
<td>Module structure</td>
<td>Visually impaired</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobility or dexterity impairment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hearing impaired</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disability-related fatigue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiple impairments</td>
<td></td>
</tr>
<tr>
<td>Student’s impairment and level of impairment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
At the University of Strathclyde, students making use of the service undergo a print assessment in addition to a needs assessment. The aim is to optimise the student’s access to print across the range of applications that they will encounter on their course, determine their print requirements and identify their training needs. The student’s print requirements are referenced when testing the accessibility of texts.

One survey respondent highlighted that it is important to reassess students’ requirements periodically. This would involve review appointments whenever necessary, but at least on an annual basis.

Staff training and development

Achieving anticipatory and individual accessible electronic provision as standard at an institutional level should be viewed as the shared responsibility of all staff of the institution. Therefore, an appropriate programme of staff training and development to promote good practice in alternative formats including electronic text across the HEI is required.

Staff training and development should support a consistent approach across an institution to producing texts, materials and documents that are readily accessible or can be easily reformatted. It should encourage accessibility to be considered at an early stage by those creating materials and reducing the need for digitisation and reformatting work further down the line.

In three of the four participating HEIs, staff development courses on producing accessible content are provided by the assistive technology or alternative format specialist. At the University of Strathclyde, training is delivered by the IT training team as part of the wider staff development programme that is available. Some other institutions also provide, or are planning to develop, staff training; The Open University is creating awareness training and information on electronic alternatives for staff and students from 2012.
Training and resources provided by the participating institutions include:

- targeted awareness sessions for departments with new students to highlight the interplay between access to study and impairments, specifically focusing on access to hardcopy or electronic materials
- simple instructions to enable non-experts to produce alternative formats and where to access advice from an experienced specialist on new formats or complicated material
- departmental templates in Word and PowerPoint to enable departments to create their materials in an accessible format
- practical workshops on using templates

‘There are no hard and fast rules when adapting – but by asking yourself “what you are doing” and “why you are doing” the proofing, you can get a better understanding of the end product and how it can be used by [...] disabled people.’

The University of Dundee training

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Training is core to the University of Dundee’s service model. Three types of training are provided.

**General awareness and in-house teaching material**
A two-hour session to enable staff to convert existing electronic teaching materials into accessible content based on software available centrally on the university’s standard operating environment. A further session enables staff to use scanners, braille-embossing machines and to develop a more in-depth understanding of alternative formats.

**Volunteer training**
A full-day session to cover the general awareness content with additional advice on scanning and editing printed material. A half-day follow-up session answers additional questions the volunteer has when they have completed a few assignments.

**Technical or advanced training for volunteers and staff**
More advanced training requires a commitment from those involved to maintain their knowledge and to update their skills on a regular basis.
A detailed online production guide is available for staff to refer to after training. The guide employs a user-centred, pick-and-mix approach with different workflows depending on original material type, equipment available and output required. Individuals who occasionally produce alternative formats appreciate the step-by-step nature.

blog.dundee.ac.uk/altformats/home/training-resources

### Digitising and OCR
Instructions on how to process information including books, PowerPoint slides, PDFs, leaflets

### Proofreading, reformatting and adaptation
Most institutions place the text into a structured word-processed document

### Delivery and output
Including e-text, braille, large print, audio and accessible PDF

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**Working with academic departments**

It is important that departments are aware of their critical role and responsibility in the production and timely delivery of accessible texts. Obtaining a student’s class or module reading list from academic departments is central to the workflow of alternative formats services, regardless of whether production is undertaken in-house or outsourced.

The case study HEIs reported that their alternative format provision reacts to two streams of reading request:

- the core and prioritised reading from the reading list supplied by the academic department or module coordinator

- reading requested directly from the supported student with direct relevance to their specific programme of study, for example for essays or examination revision. This is likely to be more prevalent the more research-focused the course – postgraduate reading requested may be solely via student request
The participating HEIs ask academic departments to provide:

- reading lists at least six weeks in advance of the student’s commencement of a course, or ten weeks or more in advance where the course content will require significant reformatting and adaptation, for example, where the student uses a screenreader and the course content includes scientific or mathematical notation
- indication of prioritised reading within lists
- dates when different reading is required

They have developed the following practices to assist working with academic departments:

- alert emails, which advise academic departments on what is required of them
- ongoing dialogue with course tutors to pick up any ‘last minute’ changes in prescribed reading and encourage the highlighting of essential and most relevant pages to speed up the production and delivery
- inviting departments to assist where complex and specialised text is to be adapted

The University of St Andrews’ service requires academic departments to provide module course reader packs, handouts and outlines, with core texts identified (including chapters or pages in certain instances) to assist the speed of delivery.

When there is a requirement for a description of complex visual material or where a high level of subject-specific knowledge is needed, the University of Stirling’s service contacts the relevant academic department to provide the detailed description which is then incorporated into the reformatted text.
Identification of reading material by the academic department for postgraduate students is limited as students conduct their own research.

At the University of Stirling, the service can help in the identification of reading by providing reformatted contents pages of books requested by the student, from which further reading may be selected and reformatted.

Communicating alternative format provision

It is important to increase awareness of alternative formats services among staff and students by including information of the services available in pre-entry guidance, during the induction processes and in staff and student handbooks. Information should be available in a range of formats and locations in the HEI, such as the library and student support services.

Seeking and responding to feedback

It is vital that the students using alternative formats are consulted to determine the suitability of the materials produced and to assist in improving the service. Many of the institutions involved in the research have developed formal mechanisms to gather feedback from students to improve their provision.
‘It would be very difficult for me to undertake my studies on a full-time basis and have time to convert the materials myself so I have found this service invaluable. It also makes a massive difference to me to be able to have the support team on hand in the university to speak to on a one-to-one basis. The personal service that they provide means that they are aware of my specific support needs and I feel more comfortable to approach them. I never feel at a disadvantage to other students because I have access to the reading materials at the same time as they do.’

Student testimonial, University of Stirling

Reusing digitised materials

Over time, individual costs can be reduced through reusing digitised materials for different students studying the same subjects. Where reuse is possible students receive more immediate access to the text and the alternative format service’s workload is reduced, which can ease backlogs.

Where copyright has been cleared there is considerable scope for digitised materials to be reused. Given the sequential nature of reformatting a document can be adapted to various levels of accessibility requirements with little need to repeat previous work.

The University of Strathclyde has been reusing materials since 2009/10, covering more than 30,000 pages (111 jobs), which saved £3300.

The Open University reuses the master copy of alternative formats for as long as the content is current (for in-house teaching/module material). Electronic alternative formats can be rendered as often as module content changes and in line with existing module maintenance procedures.
The University of Aberdeen saves digitised materials in a searchable database within the library’s catalogue to enable easy identification of material that has previously been converted.

The University of St Andrews reuses files where modules have made little or no changes to reading materials per semester. They found that there is little scope for sharing books across different institutions since the course material varies across HEIs.
5 Recommendations

These recommendations present a range of actions institutions can adapt to fit their own context to help them meet legal requirements.

**Senior management**
- Ensure the institution meets its obligation under the Equality Act 2010 to have in place anticipatory reasonable adjustments for students, including digitisation and reformatting services.
- Make sure that appropriate technology, resources and support are made available to alternative formats services. Financial management should reflect actual overall costs and budgeting should be flexible to cope with natural fluctuation in demand.
- Develop a staffing model that creates effective lines of communication across departments and divisions, and maintains a working knowledge of best practice in a rapidly evolving sector, whether through a central specialist or expertise embedded in other service areas.
- Promote cross-institution awareness of alternative formats services by including information in pre-entry guidance, induction processes and staff and student handbooks.
- Develop robust systems to ensure early identification of students requiring alternative formats, including:
  - encouraging disabled applicants to make contact with disability services as early as possible prior to admission, to enable identification of their accessible information requirements
  - ensuring that an updated list of the students’ chosen modules is available and that there are mechanisms in place for module changes to be reported
- Create a central record of information on processed material to maximise the reuse and timely provision of accessible text.
5 Recommendations

Digitisation and reformatting service

- Work closely with different departments/services to identify students requiring alternative formats and their reading lists.
- Provide clear literature for staff and students about the services available, in a range of formats and locations.
- Undertake individual print assessments to identify students’ specific barriers, training requirements, and to establish agreed formats.
- Provide training to academic departments and other relevant staff to enable them to create accessible in-house material.
- Employ a flexible and dynamic approach to reformatting methods and techniques.
- Collaborate and share practice with other institutions.

Other departments and services

- Academic departments should provide timely access to reading lists, including the dates by which the material is required, at least six weeks in advance of the commencement of courses.
- Library services should increase the number of texts available to students without human assistance and should require accessibility to feature in the text platforms they subscribe to.

Scottish higher education sector

- A central cross-institutional record should be developed to facilitate reuse of digitised material across the sector to increase timeliness of delivery to students and reduce costs for institutions. An example model is RNIB’s REVEAL online book search (no longer in service).

It would be necessary for alternative format specialists in the sector to cooperate to establish and manage the record, but institutional backing and support would be needed. Copyright legislation would need to be considered in managing such a resource.
6 Institutional case studies

University of Dundee

The University of Dundee is home to more than 17,000 students and 3000 staff. Around 12,000 students are involved in undergraduate studies, and distance-learning students account for almost 20 per cent of all students. Between 2006 and 2009, a steady proportion of eight per cent of students disclosed a disability, which is slightly higher than the national average of seven per cent (from Higher Education Statistics Agency (HESA) figures), but the number of disabled students who registered with disability services increased by almost 40 per cent over the same period. Staff disclosure figures also increased from two per cent to four per cent during this time.

Alternative formats process

The university has recently completed a two-year pilot project that investigated the feasibility of making alternative formats available in-house. The project has now led to the establishment of a document standardisation and alternative formats service after detailed cost analysis and a growing demand from current students.

The service has two aims:

- to reduce the reliance on converting material by procuring accessible academic material
- to enable an ongoing capacity to be delivered within the same cost structure by ensuring that in-house-produced material is accessible at source

To meet these aims three core objectives are to:

- develop and distribute university-wide accessible Microsoft Office templates that meet the requirements of people with impairments which make printed materials inaccessible
- establish a service to convert on-demand and historic material into alternative formats
- develop targets and an information strategy to preferentially purchase accessible information resources (eg books, ebooks, journals, online databases)

The service has acquired extensive knowledge from the project in producing alternative formats, and has established a long-term workspace and equipment room to facilitate production.
### Customer base
The target audience is users who are unable to access printed material themselves. In 2011/12 the service supported eight students with visual impairments, medical conditions or physical impairments. The service provides information primarily for students and staff in academic pursuits, but also supports the communication requirements of the wider university community.

### Service management and staffing
The service staff levels are detailed below:

- 0.5 full-time equivalent (FTE) coordinator to lead and manage delivery of the three key objectives
- 0.3 FTE disability services’ input
- 0.3 FTE library and learning centre input
- 0.5 FTE internship

The coordinator has been seconded from the university’s information and communication services department for an initial period of one year to fulfil the role until the long-term feasibility of the service can be established.

### Technology used in production
For detailed information see: [www.dundee.ac.uk/ics/services/disability/alternativeformatsprovisionproject/guidetomakingalternativeformatsatuod](http://www.dundee.ac.uk/ics/services/disability/alternativeformatsprovisionproject/guidetomakingalternativeformatsatuod)

### Formats produced and standards
The service produces documents to one standard. The standard is a structured Word document that uses styles and templates. From this standard document we are able to rapidly convert to:

- large and small print
- braille
- electronic text
- synthetic audio

Recipients are encouraged to receive the standard document and adapt it to their own requirements following training. We acknowledge that some users would prefer to have custom file formats or audio recorded with human voices and this will be accommodated where reasonable.
Financial management

The service is funded through a contribution from the university’s disabled students’ premium funding, with the exception of 0.3 FTE library staff and 0.3 FTE disability services’ staff who are core-funded by the university.

A breakdown of costs to deliver the service’s three core objectives

<table>
<thead>
<tr>
<th>Costs</th>
<th>Set-up cost and year 1</th>
<th>Yearly costs (3 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel costs</strong> (full economic costing model used)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= coordinator (0.5 FTE grade 7)</td>
<td>40000–51000</td>
<td>40000–51000</td>
</tr>
<tr>
<td>= disability adviser (0.3 FTE grade 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= library and learning centre (0.3 FTE grade 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and capital</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(IT equipment, furniture, installation)</td>
<td>8000</td>
<td>1000</td>
</tr>
<tr>
<td><strong>Operational costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(book purchases, printing, consumables, office overheads, staff and volunteer training, design services, payments to non-medical personal helpers)</td>
<td>12000</td>
<td>13000</td>
</tr>
</tbody>
</table>

Timescale from identification to output

Students’ accessible information requirements are identified as early as possible – where feasible before they join the university or during the application process – and addressed with a meeting or correspondence before the start of the academic year with a disability adviser. This process can start up to one and a half years before the start of study.

More detailed information regarding students’ requirements is gathered when the student has accepted a place at the university, at which point a full needs assessment is undertaken. Preparing material for the student’s core subject is possible in advance in most case. However students at the University of Dundee can elect two further subjects upon matriculation, for which it is not possible to prepare alternative formats in advance.
Academic materials including lecture notes and handouts are generally provided in advance of the session, if they have been created and are available. Departmental staff are given training in creating accessible material in advance, usually during the summer break.

**Sourcing copies of material**

Obtaining accessible academic books from publishers usually takes between two and ten weeks, although it is sometimes impossible. The alternative formats service aims to source alternative copies such as Kindle, Apple books, online sources of classics, and audio to speed up the process for students.

**Converting printed material**

It is difficult to predict the time it would take to convert printed material, however an estimate can be given based on past experience for which pages are categorised as ‘simple’ or ‘complex’. Simple text – which is a page of plain text such as a novel or letter – takes on average two minutes per page from start to finish. Complex text – where content includes diagrams, tables, footnotes or has a multi-column or random layout – takes eight minutes on average per page.

As an example, a textbook with 500 pages, of which 150 are simple and 350 are complex, would equate to:

\[(150 \times 2\ \text{minutes}) + (350 \times 8\ \text{minutes}) = 51\ \text{hours}\]

**Training**

Training is core to the university’s model and will continue as part of the new service. A detailed online production guide is available for staff to refer to after training. The online guide is in its fourth iteration and is broken down into a user-centred approach with different workflows depending on the original material type, equipment available and output required. As there are a lot of differing requirements, it is not reasonable to expect an occasional reformatter to remember all the steps for each type of material.

[blog.dundee.ac.uk/altformats/home/training-resources](http://blog.dundee.ac.uk/altformats/home/training-resources)
**General awareness and in-house teaching material**

A two-hour course enables staff to convert existing electronic teaching materials into accessible content based on centrally available software. Prerequisites of the course are basic Microsoft Office use and general computing skills (e.g., file management). A further two hours enables staff to use scanners and braille-embossing machines and to develop a more in-depth understanding of alternative formats.

**Volunteer training**

Volunteers are trained in a full-day initial course with a half-day follow-up course. The initial course covers the general awareness course for staff with additional training and advice on scanning and editing printed material. The half-day follow-up course covers additional questions the volunteer has when they have completed a few assignments. It is too much to cover all the options and techniques in one day.

**Technical or advanced training for centre staff**

During the pilot service, around 50 per cent of a 0.2 FTE role was spent on research and development time for two years. An assistive technology specialist fulfilled the project role but had to research, understand and then implement:

- compliance with copyright legislation and requesting accessible copies from publishers
- Microsoft template creation
- conversion techniques
- PDF, ebooks (multiple and changing formats), loose-leaf documents, braille
- a number of technological solutions (OCR software, braille embosser, audiobook-creating software)
- an online training guide
- a process for managing and coordinating NMPHs to workload
- guidance on converting complex material (tables, charts, references, time lines, diagrams) into an accessible format
- end-user technology (screenreaders, iPad, iPhone, braille notetakers, laptops)
With alternative formats production there are always changes; publishers introduce new formats, end-technology improves, legislation and contractual agreement develop and the technology used to make alternative formats improves. It is essential that sufficient time and budget are allocated to personal and professional development.

**Coping with increased demand**

Our service is based around establishing standardised accessible templates and mainstreaming the production of alternative formats. The service is scalable given ongoing funding for core staff. The daily work planned to be carried out by volunteers may be difficult to scale due to the size of the local volunteer population. The service was initially designed around the availability of DSA funding from student funding authorities (eg SAAS, SFE) that would have enabled NMPHs to be paid to undertake the service without the need to secure volunteers. It is therefore predicted that per year we may only be able to effectively support up to ten users with impairments that make print inaccessible.

**Reuse of material**

The alternative formats service has not reused material within the pilot or service yet.

**Risks or issues with the current service**

The main risk is lack of funding to continue service delivery beyond the first year of operation.
Consideration of outsourcing production

A cost comparison of the service was carried out to establish the feasibility of in-house production. The table below breaks down the costs based on nine users requiring four full books to be converted, sourcing ten ebooks and converting 250 sheets of information.

<table>
<thead>
<tr>
<th></th>
<th>No. per person</th>
<th>Outsourced</th>
<th>In-house</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cost/ unit</td>
<td>Cost/ person</td>
</tr>
<tr>
<td>Printed 400-page textbook</td>
<td>4</td>
<td>4300</td>
<td>17200</td>
</tr>
<tr>
<td>Sourcing accessible ebook</td>
<td>10</td>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td>Printed leaflets, handouts, exam</td>
<td>250</td>
<td>10.75</td>
<td>2688</td>
</tr>
<tr>
<td>papers etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated cost per person</td>
<td></td>
<td>20388</td>
<td>3090</td>
</tr>
<tr>
<td>Fixed costs (staff and office</td>
<td></td>
<td>13000</td>
<td>58000</td>
</tr>
<tr>
<td>costs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost for nine students</td>
<td></td>
<td>196488</td>
<td>85810</td>
</tr>
</tbody>
</table>
University of St Andrews

St Andrews was Scotland’s first university and is the third oldest in the English-speaking world, founded in 1413. Over six centuries it has established a reputation as one of Europe’s leading and most distinctive centres for teaching and is one of the leading research-intensive universities in the world. It is the top mainstream university in national student surveys 2006, 2007, 2008, 2009 and 2010. The university is in the 1994 Group of universities.

In academic year 2010/11 there were 780 students who declared a disability to the university, of which 747 registered with student services requiring support. Of these, 420 are registered with a specific learning difficulty. Of those registered with the university, 106 have impairments that make print inaccessible: 11 are blind or visually impaired, 95 are dyslexic.

Alternative formats process

The University of St Andrews created the alternative format suite in 2004 to produce in-house electronic accessible reading materials for students with impairments that make print inaccessible. This followed an evaluation of outsourced services, which proved to have a number of inconvenient aspects including poor timeliness, inflexible end-products and inflexibility to alter the requirements part way through production. Student services assess the requirements of registered disabled students with impairments that make print inaccessible. The alternative format suite manages the production once the reading materials are confirmed. The alternative format suite-produced ebooks are not on open shelves in the university libraries, they are not sold and there is no charge for the service. The alternative format suite volunteers bring their own skill sets to the service which helps to make the alternative format suite system adaptable and flexible to support all kinds of impairments.

The alternative format suite aims to produce, in most cases, an adapted versatile, flexible and proofed Word document format which can be saved into many different formats including braille, audio and large print. The ‘one-style-fits-all’ approach to production takes only a little longer but is worth the effort as it improves reusability where copyright permissions allow.
The versatile nature of the production means the alternative format suite does not necessarily need to know the student’s impairment, but of course it helps to meet with the student to negotiate timescales and what is realistically possible.

The alternative format suite aims to provide formats that:

= are accessible, virus free and error free – even correcting original print errors

= are easily navigable

= include ‘value-added text’ – adapted text with descriptions to enhance diagrams, figures, tables, special announcements, footnotes, index adaptation, etc

= enable independent study at a higher education level

= are turned around fast and effectively – this has allowed some students to change their minds within the first two weeks of semester giving them the same opportunities as their sighted peers

University advertising materials are also converted. The most common materials to be adapted are the departmental course handbooks.

**Customer base**

In 2010/11 the alternative format suite supported 20 students and in 2011/12 it supported 18 students, all with visual impairments or dyslexia.

**Service management and staffing**

The alternative format suite manager (1 FTE) coordinates all aspects of the alternative format cycle and liaises with students, volunteers, student services, libraries, disability teams, departmental secretaries, module coordinators and publishers.

The alternative format suite manager is currently based within student services.
**Departments and staff involved**

Student services provide all aspects of support for students. The IT service assists the student with their hardware and software provision and training. Departmental disability coordinators advise and support the student in line with the module programme. The alternative format suite provides the formatted text after negotiating best options due to time constraints and the student’s requirements. Libraries help whenever possible for longer loans of certain books. The helpdesk is often involved when a request comes in for hardware or software training.

**Unpaid volunteers**

The alternative format suite manager is responsible for recruiting, training and retaining volunteers who are drawn from across the community and the university. The production process is prepared and organised so that volunteers can come in and continue with any tasks in progress, usually scanning, converting and proofing. Additions to the process include reading and prooflistening during DAISY digital talking-book production.

In-house training is provided and tailored to the individual volunteers on a one-to-one basis or in small groups to develop confidence in:

- editing with Microsoft Word
- producing good, clean scanned documents
- using OCR software to convert and prepare the electronic text for adaptation
- editing the electronic text to make it accessible for disabled people with a range of impairments
- recording and editing audio files with specialist DAISY software

The alternative format suite gains multiple production-hours per day, with an annual average of 35 volunteer-hours per week since 2004. Student services and IT services jointly fund a Christmas party to thank the volunteers each year.
### Volunteer and student testimonials

[www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite/Volunteertestimonials](http://www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite/Volunteertestimonials)  

[www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite/Studenttestimonials](http://www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite/Studenttestimonials)

### Academic departments

The departments provide the alternative format suite with module course reader packs, handouts and outlines. Core texts are identified with chapters or pages in certain instances to assist the speed of delivery of ebooks.

Departments are invited to assist where complex and specialised text is to be adapted. Students can also direct the alternative format suite with further reading especially if they are writing essays or theses.

### IT services

IT services supports the alternative format suite by maintaining operational funding, hardware and software upgrades, internal and external network structures for file sharing such as secure site for student book retrieval and FTP to publisher site to retrieve their files, funding for off-site visits and for ad hoc requests by the alternative format suite manager.

### Technology used

There is a vast array of technology available and the alternative format suite has obtained a small but dynamic set of peripherals including PCs, Special Edge scanners, text-manipulating software, and braille and audio production tools.

### Costing

As there are many variables to take in to consideration, it is not possible to give an estimate of production costs.

### Funding model

The first 12 months (2004/05) were funded by the Scottish Funding Council (SFC). The alternative format suite has since been funded by university core funding. The university receives a disability premium from SFC. This year it is £83,000 and is used to support students who are not eligible for DSA and to fund equipment and alterations.
University of Stirling

The university is home to over 12,300 students and 1400 staff. Around 23 per cent of students are from overseas and over 100 nationalities are represented on campus. Most recent HESA statistics indicate a disability disclosure rate of over seven per cent at the university. In December 2011, 765 students had disclosed a disability to the university and registered with the disability service: 310 students have a specific learning difficulty such as dyslexia or dyspraxia; there are 24 blind or visually impaired students; 36 students have a physical impairment or mobility issue; 55 students have multiple disabilities and 27 students are either deaf or have a serious hearing impairment.

Customer base

The University of Stirling’s alternative format service supports 25 students who are blind or have a visual impairment, mobility/dexterity impairment, chronic fatigue, severe dyslexia, hearing impairment (audio transcriptions and subtitles) or multiple disabilities.

Student-specific electronic reformatting

The university is committed to providing as close to a completely accessible reading scenario as is possible; to achieve this, each student who requires alternatively formatted material is individually assessed. Each format is determined by a number of factors unique to the student including:

= student disability
= student IT capability
= assistive technology used by the student and institution
= student-specific working practices
= module reading structure
= subject-specific teaching methods linked to the format of both the module and original texts
The university’s approach when reformatting academic texts into student-specific formats provides:

- error-free accessible texts
- a means of navigation
- text that flows free from interruption
- the facility to develop and maintain independent study
- flexibility of format
- adaptation due to change of module reading or change in status of disability
- fast and effective turnaround of accessible texts

**Preparation of fit-to-scan reading material**

Due to individual need, reading for some students supported by the alternative format service is converted into loose-leaf pages. This process is designed to work in conjunction with the students’ own scanners which are equipped with automatic document feeders to give a fast, effective method of scanning multiple documents, thus allowing students to work independently.

The preparation of these loose pages is done to a timetable enabling students to access materials at the appropriate time. The alternative format service is guided by specific reading detailed by module coordinators for each lecture, seminar or laboratory. We also prepare material requested by supported students for essay or examination reading.

**Production of examination papers in alternative formats**

The alternative formats adviser is responsible for the adaptation of electronic examination and class test papers so that they are compatible with the university’s in-house electronic log-on system.

**Cross-institution reformatting services/advice**

The service reformat examination papers and provides advice for academic schools and departments on webpage and software accessibility and postgraduate research students on converting questionnaires into alternative formats.
Service management and staffing

The alternative formats adviser (1 FTE) coordinates all aspects of alternative format provision (member of the disability service, based in the university library). The alternative format service is part of the disability service; it provides a comprehensive ‘one stop shop’ service for both students and academic staff from the assessment of reformatting need through to delivery of reformatted texts.

Departments/staff involved

≡ **Disability service**
Disability advisers, who are the first point of contact when a student discloses a disability to the university, refer students who may require material in an alternative format.

In-house production and flow of reformatted texts are managed by the alternative format service adviser who also has the responsibility of keeping up to date with sector developments.

≡ **Recruitment, admissions and registry**
Provide the alternative format service with advance notification of new students with visual impairments to facilitate contact over the summer break.

≡ **Paid reformatters**
Five reformatters are responsible for the production of accessible, student-specific reformatting within the timeframe indicated by the alternative formats adviser. At times of peak demand, the team of reformatters can work in excess of 300 hours per month.

Having paid reformatters means that there is an expectation of a level of professionalism, quality of service, consistency and accountability that would be unrealistic to expect of volunteers. As paid staff, the university can expect a level of commitment that is essential given the current demands on the service. It has also meant that we have managed to retain trained and experienced staff; this expertise is utilised to ensure that the alternative formats service delivers the optimum service possible.
### University schools
The relevant module coordinators provide the alternative format service with the current handouts and outlines indicating core texts, specific lecture, tutorial and workshop reading and prioritised chapters from books or journals.

When it is necessary to incorporate a description of complex visual material in the reformatted text, module coordinators are contacted to provide a detailed description.

### IT department (information services)
Maintain networked assistive software, laboratory computers and network.

#### Formats produced and standards
In addition to the electronic formats referred to in the report braille, tactile diagrams and transcriptions from audio sources (for hearing-impaired students) are also produced.

#### Timescale from identification to output
Disclosure of a visual impairment at the point of applying to the university results in the student being contacted by the disability service to introduce the alternative formats service. Upon acceptance of a place, the student is strongly advised to contact the alternative formats adviser to arrange an assessment, if appropriate, ideally ahead of their first semester.

Once a basic reformatting structure is identified and agreed, sample chapters are produced as trial files. Feedback is obtained, the process is refined and instructions are disseminated to the reformatters. Formatting structures are frequently reviewed and updated.

Productivity is managed so that the pool of reformatters can produce work with minimal delay to the supported student. By far, the majority of work is produced between semesters.
### Training
All training is developed and provided in-house by the alternative formats adviser. The structure of reformatting procedures is written up and used as training tools and guides. These guides are updated regularly, based on student feedback and incorporated into training materials.

### Training for alternative format service staff
Staff receive disability awareness training specific to alternative formats production, alternative format methodologies, assistive technology training (specific to alternative formats production), training in standardised reformatting procedures and current student-specific reformatting procedures.

### Coping with increased demand
The current staffing level of the service means that it is now working to capacity. The university is seeking to recruit more reformatters to meet increasing demand. All members of the reformatting team are employed on zero hours contracts so that the service can react to demand without incurring costs during less intense periods.

In the unusual event of a student disclosing a complex visual impairment just before commencement of their course, the service would experience a considerable surge in demand.

### Reuse of material
Where possible, reformatted material is reused but given the constant evolution of module content, opportunities may be limited.

### Risks or issues with current service provision
The arrival of several new Student Awards Agency for Scotland (SAAS)-funded students with complex or severe visual impairment would result in a considerable increase in demand on AFS resources.
An extract from a student testimonial

‘I am currently undertaking a master’s in social work at the University of Stirling. I applied to and was accepted [by two other universities] however I chose to attend Stirling because of the support that they were able to provide me during my studies. I am visually impaired and met with the student support department before undertaking my course to discuss my support needs.

During my time at the university a valuable resource that I have used on a daily basis has been the reformatting department based in the library. They convert books and journals for me into an accessible audio format when I require them and sometimes at very short notice. Lecturers often suggest specific books and journals to accompany the course modules on top of the recommended book list.

It would be very difficult for me to undertake my studies on a full-time basis and have time to convert the materials myself so I have found this service invaluable. The personal service that they provide means that they are aware of my specific support needs and I feel more comfortable to approach them. I never feel at a disadvantage to other students because I have access to the reading materials at the same time as they do.

The system currently in place cuts out many of the complications that I would have faced at other universities as I would have been required to apply for a grant to obtain the finances to then select and pay an external worker. Not just anyone can do this kind of work as the person also has to have a real understanding of an individual’s support needs and have the necessary training to meet these. As the service user I need to have the confidence that the people who are implementing these services understand the importance of their work and take their responsibilities seriously.

Stirling University is very close to making equality an actualisation with their current formatting service as it is not just about equipment and having a policy written, it is about understanding a person’s needs and educating employees about inclusion.’
University of Strathclyde

From 2010/11 HESA figures for the University of Strathclyde there were 19,459 students, of whom 12,393 were undergraduates and 686 were distance learners; 1003 disclosed a disability. There was a 22 per cent increase in disability disclosure from 2009/10 to 2010/11, and this increase was maintained in 2011/12.

The university employed its first assistive technology adviser in 1998. The assistive technology team has grown to four with a manager, two advisers and one support officer. The team, based within the disability service, is employed by the information services directorate (ISD) and this arrangement has supported the ethos of building knowledge and expertise, in support for disabled students, across the university.

ISD launched its central scanning service in September 2007. The service was developed in readiness for subscribing to the Copyright Licensing Agency (CLA) scanning licence. One key aim of adopting the licence was to provide a means of better supporting copyright compliance, by providing a service for academic departments wishing to use the university’s virtual learning environment for delivery of class materials and resources. The service was mindful to build in processes to allow academic departments to request accessible referenced reading materials for their visually impaired students. The service is restricted to external materials, and we advise that all in-house authored materials should be created accessible at source, and that training is available where required.

Alternative formats process

The university adopted the scanning element of the CLA licence in 2007, initially on a trial basis. The CLA licence includes the condition that scanning is performed by named designated individuals, and that all scans must be logged and strictly reported back to CLA to ensure compliance with the licence, to demonstrate, among other things, that textbook replacement is not occurring.

Within the scanning service, the term ‘CLA scan’ refers to scanning for the class and ‘CVIP scan’ refers to specific requests for individuals who would be covered by the terms of the Copyright (Visually Impaired Persons) Act 2002.
**CLA workflow**

The standard CLA workflow begins at scanning request from the academic department to the library digitisation request service. Each individual request is logged as a job. A job can be an extract from a book, journal or magazine. Where the job meets the criteria for scanning under CLA, then the next step is to check the university catalogue for an existing copy. Where copy exists, a link to this is provided to the requester. Where no copy exists, the material is located and prepared for scanning. A coversheet is created and accompanies the prepared job which is passed to scanning. After scanning, the resultant image-only PDF is processed using OCR software and saved as PDF with searchable readable text, mindful to meet general accessibility requirements. This PDF is then stored securely using Digitool and a link is provided to the requester.

**CVIP workflow**

The CVIP workflow typically begins at the disability service. The disability service, in reviewing the university’s applicant extract facility, can identify disabled applicants who are likely to use the scanning service. Such applicants are contacted with urgency and following an initial assessment of their needs, where the text requirement is confirmed, the disability service would add their print requirements to the VIPScan database and would send an alert email to the academic department, copying in the library request service and the student/applicant.

The CVIP workflow from request onwards encompasses the standard CLA workflow, branching out for text accessibility check and has the extended processes of proofreading, reformatting and adaptation where required. Scanning under CVIP is not subject to the same restrictions as scanning under the CLA licence. A job could be a few pages, an entire chapter, an entire journal article, a number of chapters or an entire book.
The CVIP workflow has the following processes:

- identification and assessment of CVIP students by the disability service
- first contact, needs assessment and print requirements assessment
- alert email sent to academic department and library digitisation request service
- adjustment report published to disabled students’ requirements system on staff information portal (Pegasus)
- academic department liaison with library digitisation request service to submit required reading list for identified students
- library digitisation request service processes the request

- initial checks:
  - does student meet criteria for CVIP?
  - is there a reuse available? (review database)
  - is there a text available within the library catalogue?
  - is it possible to obtain a version from the publisher?

- electronic text accessibility checks to release job to student or send to scanning
- prepare for scanning
- compliance coversheet to detail conditions of use of job
- scanning to high quality image PDF
- OCR to render ‘page image’ as readable text with pictures, which is saved as Reflow-capable with image retained
- pre-released version delivered to student’s secure books folder and email notification sent to student detailing new title delivered
- light proofreading checks of pre-released jobs and re-deliver as required
- thorough proofreading is required with reformatting of complex textual representation and adaptation of non-textual elements to produce alternative format where this is demanded by the student’s print requirements
Customer base

The service provision is restricted to those students covered by the CVIP and therefore is for individuals who are visually impaired, blind or physically unable to turn pages or carry a standard book. Our wider group of students for whom printed materials are inaccessible is supported by on-campus access to training and resources to independently prepare their reading materials.

Since the launch of the service in 2007, the student group has increased by 71 per cent. From 2010/11 to 2011/12 the number of students using the service increased from 13 to 22, an increase of 69 per cent, and this current group has a combined total of 119 classes. Within the group:

- 14 per cent have difficulty turning pages or carrying books
- 55 per cent require a font size ranging from 12pt to 16pt
- 23 per cent require a font size greater than 16pt
- 9 per cent use a screenreader

Service management and staffing

The scanning service committee that guides the scanning service has the following membership:

- help and reader services manager (chair)
- information governance and compliance manager
- research and learning support manager
- senior library systems analyst/developer
- faculty librarian (responsible for contacting publishers)
- assistive technology manager
- proofreading and adaptation coordinator

Operationally the scanning service has two FTE roles: 0.8 FTE library request, 0.5 FTE scanning with 0.1 FTE NMPH coordinator and 0.5 FTE proofreader. The staff are drawn from a variety of sections and tasks are shared. If demand is high additional hours are worked by hourly contract staff.
Technology used in production

- OpenBook scanning machine that produces high quality scans across a wide range of book sizes.
- ABBYY FineReader corporate software that has professional OCR capability with batch process functionality through its Hot Folder application for OCR, proofreading and reformatting.
- Student assistive software for reading, including:
  - Kurzweil 1000 and Kurzweil 3000
  - ZoomText magnification/reader
  - JAWS screenreader
  - Read and Write Gold with PDF Aloud

Formats produced and standards

Our aim is to deliver readable electronic versions of the required text on time.

For students using screenreaders we have provided the text in Kurzweil 1000 format with thorough proofreading. Reformatting and adaptation are carried out as required. The student group requiring large print expressed a preference to sight read where the text can be displayed to suit their print preference, and reserve the option to have the text read aloud. We provide their material in PDF format that has ‘page image’ preserved with high quality OCR text underneath which can Reflow. Students are given training on how to optimise for comfortable sight reading and for text-to-speech supported reading.

This format can be batch produced and pre-released to the student with minimal delay post scanning. Delivery is via a shared network drive and a notification email is sent. The materials are then checked in the background and revised versions are re-released as required. Pre-released PDF is also made available to those who will be provided with Kurzweil 1000 format.

The ‘page image’ is required for any areas where the Reflow has misrecognition errors. Delivering via Microsoft Word, or other formats that discard the page image, requires more thorough proofreading as these formats are reliant on the text that has been recognised which can include recognition errors.
Financial management

The original funding model was of limited cost recovery, where the university met the running costs and heavily subsidised the cost of scanning, proofreading and adaptation, and where applicable, sought to recoup the costs through the DSA. As a consequence of the removal of SAAS funding, and in response to increased demand, we are currently reviewing our processes and funding model.

Over time, individual costs can reduce through the reuse of digitised materials, however, this may be time-limited as new editions of archived texts are released. An increase in availability of ebooks from publishers would reduce the need for scanning, and therefore should be explored.

Timescale from identification to output

Alert email reminders are sent ten weeks prior to the start of each semester, with the aim of ensuring that the library receives the required reading lists in good time. The timescale from identification of job to delivery is greatly increased when bottlenecks occur. Bottlenecks occur when reading lists are received late and where the volume of work to be processed cannot be managed by the required date in the time available.

Each stage of the workflow is the responsibility of the expert in that area. Key status dates are logged against the job on the database (eg date requested, scanned, proofread, delivered to student), and thus can be monitored and measured. Students and staff have the ability to prioritise a job by emailing the service and where possible this will result in the job being accelerated through the process.

Training

The disability service and the assistive technology team offer information sessions to departments to raise awareness of the issues faced by their students accessing print, and to provide an overview of the service offered with an emphasis on what is required from them.
The ISD training team introduced assistive software training for staff and students in 2002; with accessibility guidance introduced to all of their Microsoft Office courses in 2007 and a dedicated course on the creation of accessible Word and PDF documents introduced in 2010. All courses are driven by waiting lists and so staff and students can sign up at any time and classes are scheduled on demand.

Presently, we have two staff members fully trained in the use of the scanner. Training in proofreading, reformatting and adaptation is provided by the assistive technology team on a one-to-one basis as new staff are identified for the role.

**Reuse of material**

The processes from scanning through to delivery are linear, whereby a readable resource is created first following which the accessibility can be altered to suit the requirements of the reader. A text with light-touch processing can therefore be reused by a student, who has greater requirements, with additional stages of work being done but no re-working should be required.

For the first semester of session 2011/12, there has been in excess of 320 job requests of which 50 per cent were required to be scanned; 25 per cent were met through reuse and 25 per cent were met through texts. In terms of pages this equates to an excess of 68,000 pages, with 43,000 pages scanned; 13,000 pages reused and 12,000 pages available through text resources available via the library catalogue. The required reading volume of referenced texts varies by course. For our group of 22 students, jobs per student, across this period, range from less than five to more than 40.
### Risks or issues to current service

Where success of the service is measured on getting the students’ required reading to them, on time, in a readable format, it is greatly dependent on:

- timely identification of the students and their class codes and programmes
- timely assessment of students’ print requirements
- timely provision of reading lists with meaningful reference to required reading and meaningful required by dates
- capacity and flexibility to meet demand at points of high volume demand

### Consideration of outsourcing production

Difficulties experienced through outsourcing acted as a driver to develop capability in-house. Outsourcing is costly and can be inflexible. It should be noted that outsourcing would cover the scanning and alternative format process only. The resource required to determine and manage the reading list would remain, as would delivery to the student. Having the expertise in-house allows for flexible provision and avoids over-production which can lead to delays and late delivery. Outsourcing is reliant on a considerable lead time from request.

### Choice between producing readable and accessible material

Our aim is to ensure that the students receive readable material on time, and are supported to be autonomous learners. Where a text exists within the university catalogue it is checked to determine whether or not it is readable. If it is readable then it is made available to the student. It is the case that texts are passed as readable rather than accessible. This ensures that students have the earliest access to the text. The hosts within the university catalogue vary quite significantly, and so the student will develop a skill set in accessing texts, and therefore should have wider reading options when extending their reading. Students are advised that they can request that the text be scanned, if they find that the text functionality is too restricted and it is a text that they will use heavily.
## Further resources

### Professional bodies
- ATANET (network of assistive technology advisers in higher education in Scotland)
  
  www.atanet.org.uk

### Research resources

- RNIB – availability of accessible publications
  
  www.rnib.org.uk/professionals/solutionsforbusiness/publishing/pages/publishing_industry.aspx

- JISC TechDis Alternative text formats: accessibility essentials resources
  
  www.jiscTechdis.ac.uk/techdis/technologymatters/beyondtextandprint

- JISC TechDis good practice guidance for library and information professionals: moving towards accessible ebook platforms.
  
  www.jiscTechdis.ac.uk/ebookslibrarystaff

- Enabling Technologies Framework project (developing best practice guidelines for publishers to follow in their production process)
  
  www.editeur.org/109/Enabling-Technologies-Framework

- JISC TechDis online accessibility self-evaluation service (OASES).
  
  www.jiscTechdis.ac.uk/techdis/userneeds/auditing/onlineassessmentservices
### Funding background
[www.atanet.org.uk/research](http://www.atanet.org.uk/research)

### HEI sites
- University of St Andrews
  [www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite](http://www.st-andrews.ac.uk/itsupport/academic/specialneeds/AlternativeFormatSuite)
- University of Dundee
  [blog.dundee.ac.uk/altformats](http://blog.dundee.ac.uk/altformats)
- University of Stirling
  [www.student-support.stir.ac.uk/advice/disability/teaching-learning/index.php](http://www.student-support.stir.ac.uk/advice/disability/teaching-learning/index.php)
- University of Strathclyde
  [www.strath.ac.uk/disabilityservice/accessibility](http://www.strath.ac.uk/disabilityservice/accessibility)
Equality Challenge Unit

ECU works to further and support equality and diversity for staff and students in higher education across all four nations of the UK, and in colleges in Scotland.

ECU works closely with colleges and universities to seek to ensure that staff and students are not unfairly excluded, marginalised or disadvantaged because of age, disability, gender identity, marital or civil partnership status, pregnancy or maternity status, race, religion or belief, sex, sexual orientation, or through any combination of these characteristics or other unfair treatment.

Providing a central source of expertise, research, advice and leadership, we support institutions in building a culture that provides equality of both opportunity and outcome, promotes good relations, values the benefits of diversity and provides a model of equality for the wider UK society.