EPUB and dyslexia in Europe

Uses and potential of EPUB ebooks for dyslexic people

Luc Maumet - March 2019

Objective and methodology of the study

This study is the continuation of the work already carried out by Luc Maumet for EDRLab, summarized in a report submitted on 7 February 2018 entitled "*Rapport final mission EPUB et dyslexie*"[1] (in French).

The purpose of this study is to confirm EDRLab's choices for text adaptation for dyslexic persons. On one hand by validating the functionalities to be implemented in Readium 2 and on the other hand by determining the validity of the proposed roadmap to promote EPUB in terms of written access for dyslexic people.

We were interested in the use of the EPUB by European structures working on the issue of written access for dyslexics. In particular, we have considered the complementarities of use between EPUB and other formats in the ongoing transition (to EPUB format) for structures specialised for years in access to reading for print impaired persons. We also collected testimonies of use of commercially distributed EPUBs by dyslexic people, as well as the limitations they observed.

In this study, we aim to present a diversity of points of view, but also to identify common trends across this field of activity.

Interviews conducted

We conducted interviews and made presentations of EDRLab's work on written access for dyslexic audiences with 21 people in individual and group interviews.

The functionalities that EDRLab proposes to implement in Readium2 (see Annex 1), as well as the map of digital solutions for dyslexics[2], have been systematically shared prior to and during teleconferences.

The experts contacted are part of three groups :
- Associations or support structures for dyslexics;
- Specialized libraries or structures producing adapted materials for people who are unable to read in general (visually impaired people...), including dyslexics;
- Specialized libraries or structures that produce documents for people with specific language and learning disabilities but not for other categories of people who are prevented from reading due to a disability.

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[1] https://www.edrlab.org/public/a11y/EDRLab-Dyslexie-2018.pdf
[2] https://framindmap.org/c/maps/618926/public and Annex 2

The experts contacted come from 14 different European countries:

- Austria, Belgium, Croatia, Denmark, France, Germany, Greece, Ireland, Italy, Malta, Slovenia, Scotland, Sweden, United Kingdom.

	Country	Name	Organization
1	Germany	Christiane Felsmann	DZB
2	Austria	Michael Kalmar	EDA
3	Belgium	Anny Cooreman	AdiBib
4	Belgium	Anne Demanet	NumaBib
5	Belgium	Saskia Boets	Luisterpunt
6	Croatia	Jelena Lesaya	CLB
7	Denmark	Lars Sander	EDA
8	Denmark	Daniel Dam Freiling	Nota
9	Denmark	Morten Sjøgren	Nota
10	Scotland	Cathy Magee	Dyslexia Scotland
11	France	Vincent Lochmann	EDA
12	Greece	Giannis Karagiannakis	EDA
13	Ireland	Rosie Bissett	EDA
14	Ireland	Lina Kouzi	NCBI
15	Italy	Cristiano Finishes	EDA Board
16	Italy	Christina Musinelli	LIA
17	Malta	Ruth Falzon	EDA Board
18	United Kingdom	Sue Flohr	EDA Board
19	Slovenia	Gregor Skumavc	Bravo
20	Sweden	Bengt-Erik Johansson	EDA Board

21	Sweden	Peter Häggstrand	EDA Board

Norms and standards

During the first study that led to the publication of the report "*Mission EPUB et dyslexie*" [3], we searched in vain for a standard or norm for adapting documents for dyslexics.

By norm or standard we obviously do not mean here a set of precise specifications as to the different characteristics of the display. For example, we were not looking for a consensus on the desirable interline spacing for dyslexics. But we were considering, rather, finding recommendations on the different functionalities that a text adapted for dyslexics should present. For instance, the possibility for the end user to be able to adjust the size of the interlines.

Lack of consensus

The interviews we conducted for this study with stakeholders at European level also did not allow us to find a set of adaptations that could be agreed upon.

We therefore believe that as of today there are no universally accepted recommendations on the useful functionalities for a dyslexic person for the presentation of a digital text. Moreover, apart from known standards such as EPUB or Daisy, there is no consensus on any format. The massive use of PDF, as we will see, cannot be considered as a standard since the levels of accessibility of these PDFs are very variable.
While there is no consensus on standards or norms for text adaptations useful for dyslexics, there is a common use of a limited number of reading tools adapted to the needs of dyslexics. We can present each of these solutions on the EPUB and dyslexia map (see Appendix 2).

Difficulties of exchange

The lack of consensus on how to make the text accessible to dyslexics can be explained by a relative lack of sharing of expertise. The most striking finding of this study is certainly the

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[3] https://www.edrlab.org/public/a11y/EDRLab-Dyslexie-2018.pdf

disparity in practices observed and the weakness of knowledge sharing in the production of adapted or accessible documents between certain structures.

A strong network for the exchange of information is built on the foundation of networks related to the care of people with vision impairments. Thus Daisy plays an essential pooling role. However, it can be seen that initiatives are emerging that are being built almost entirely outside known networks.

On several occasions, we have shared information with our interlocutors that they have indicated to us is of the utmost interest to them. This lack of information flow and standardization should be compared with the fields of visual impairment where, for example, the practices of adapting documents or producing natively accessible documents are the subject of broad consensus and constant information sharing.

Digital books and schooling

The accessibility of textbooks used in schools is considered a central issue by all structures with which we were able to discuss. The stakes are twofold:

- provide the conditions immediately necessary for the continuation of schooling.
- allow the dyslexic child or adolescent, as far as possible, to overcome his or her initial difficulties, which obviously requires access to appropriate documents. The hope is that the use of adapted documents will only be temporary.

The preferred distribution format for some actors producing and distributing adapted textbooks is PDF. Examples include Numabib and Adibib in Belgium, Bookin in France or LIA in Italy (in the pipeline).

Weak demand on EPUBs

Several actors indicate that the demand for textbooks in EPUB is very low or non-existent; this is the case for Bookin[4] in France and LIA[5] in Italy.

The case of LIA is particularly symbolic since this institution has a very strong expertise in the production of natively accessible books in EPUB format. However, LIA told us that its next project for dyslexics would be based on the distribution of PDF formatted ebooks.

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[4] https://bookinlu.wixsite.com/bookin-lu
[5] https://catalogo.fondazionelia.org/

Of course, we can wonder about the cause of this lack of demand. As we will show, many structures producing and distributing adapted documents work exclusively with the PDF format, which in fact is conditioning the requests.

ADIBib: adaptation and distribution of PDFs

In Flanders (Belgium) ADIBib[6] offers PDFs adapted from textbooks. The work is done under agreements with publishers and not under copyright exceptions benefiting to print impaired persons.

ADIBib obtains permission from textbook publishers to produce an accessible PDF version as well as permission to distribute it through channels different from those usually used by publishers. Indeed, commercial platforms for digital textbooks do not support their use in specialized reading software used by dyslexic people.

ADIBIb emphasizes the importance of the work done to move from original PDFs to adapted PDFs. We can think that it is the weakness of semantic markup in source files that explains the complexity of the interventions to be performed.

Specific developments have been carried out by ADIBib to reduce adaptation costs. It should be noted that the EPUB is not one of the formats that ADIBib is currently considering, either in production or for research purposes.

Numabib (French-speaking Belgium) adaptation and distribution of PDFs

The choices of Numabib's[7] (French-speaking Belgium) in terms of adapting textbooks are also very interesting. Indeed, Numabib has certainly relied on ADIBib's expertise, but the launch of the service is much more recent.

Numabib offers registrants access to adapted textbooks in PDF format. Demand was immediately very strong with 736 students enrolled in the first year.

Even if the launch of their service is very recent (2018), Numabib's creators have nevertheless opted for PDF. Recent developments around the EPUB in terms of accessibility have not led French-speaking experts to consider another distribution or back office format.

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[6] https://www.adibib.be/
[7] https://www.numabib.be/

The work is not done under a copyright exception but in contractual relationships with publishers. Numabib requests permission from publishers for each title to be adapted.

The essential role of expertise sharing between ADIBib and Numabib certainly explains the use of PDF. But it is also on the human resources side, which is very limited, that we must look at to explain the use of this format.

Numabib produces and distributes two types of PDFs: NumaA and NumaB. NumaBs, which have been subject to less extensive adaptation work, can be used with specialized reading software used by dyslexics, but errors can still occur if the reader uses speech synthesis. For NumaAs, a proofreading is performed page by page: to check, for example, whether all text boxes have been identified or whether automatic language recognition is good.

Numabib does not currently collaborate with the Ligue Braille[8], i.e. the largest library of books adapted for the needs of people unable to read in French-speaking Belgium, but whose services are reserved for people with visual impairment. This contrasts with many other European countries where the work historically done for people with vision problems now benefits all people who are prevented from reading due to a disability.

Bookin (France): adaptation and distribution of pdf

In France Bookin is a producer using copyright exception to produce PDFs adapted from textbooks for dyslexic students. This legal framework allows Bookin to adapt and distribute textbooks. In addition, Bookin has access to all school textbooks published in France via the Platon platform[9] of the Bibliothèque Nationale de France.

Bookin shares the observation of the Belgian adaptive structures: on a chain of adaptation which consists in moving from a PDF provided by a publisher to an accessible document, the least technically demanding solution is, of course, to distribute PDF.

Bookin ensures a limited adaptation of the PDF it received: the goal is to distribute files compatible with the *Dysvocal* reading software. However, work is done to put them in order and check their completeness, as well as to check the possibility of selecting each text block individually so that it can be supported in the *Dysvocal* software.

Bookin insists on the extremely tight deadlines for making textbooks accessible, which justifies the implementation of the simplest possible processing chains. Moreover, Bookin insists on the fact that his proposal is only intended for dyslexic people. The solution allows you to select the text and listen to it with text to speech.

For Bookin the poor technical skills of parents of dyslexic children also justify the use of PDF, a format which is known to the general population.

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[8] https://www.braille.be/fr
[9] https://exceptionhandicap.bnf.fr/platon-web/

However, Bookin points out his strong interest for the EPUB format. In particular for the editorial offer outside textbooks and texts studied in school such as novels on the curriculum.

From visual impairment to dyslexia: EPUB in expanding services

In terms of volume, most adaptations of books for people who are unable to read because of a disability have long been made for people with visual impairments.

In some countries, such as France or Germany, the copyright exception benefiting to print disabled persons did not, until recently, make it possible to produce adapted books and lend them to dyslexic people. The evolution of legal frameworks, in line with the Marrakech Treaty, has changed the situation.

Today, some historical libraries have widely opened their services to dyslexics. This is the case, for example, of Nota[10] in Denmark or MTM[11] in Sweden, others are in a transitional phase such as AVH[12] in France or DZB[13] in Germany.

This transition is a very good opportunity to observe the technical choices made, the role of EPUB in the services offered to dyslexics and the possible transition, for these audiences, to the use of natively accessible EPUBs.

Luisterpunt in Belgium: another example of cooperation with publishers

Luisperpunt[14] is a library specialising in services for print impaired persons in Belgium, traditionally serving people with visual impairments. Luisterpunt now also provides services to dyslexic people.

The majority of its loans are made with audiobooks in Daisy 2.02 format. Users who are unable to read can choose between a dematerialized distribution or a CD. Luisterpunt works closely with public libraries. Since 2018, they have been able to help dyslexics persons subscribe directly to Luisterpunt's Daisy audio book loan services.

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[10] https://nota.dk/
[11] https://www.mtm.se/english/
[12] https://www.avh.asso.fr/fr
[13] https://www.dzb.de/en/index.html
[14] https://www.luisterpuntbibliotheek.be/nl

According to Luisterpunt, the promoted usage is for a dyslexic person to borrow a hard copy from his or her public library, withLuisterpunt lending the Daisy Audio version for the person to be able to read with his or her eyes and ears.

Luisterpunt insists on the importance of being able to show that this reading mode does not lead to less sales for publishers.

Luisperpunt does not have a precise date for a transition to the EPUB for its production and distribution but collaborates with publishers in particular on promoting the transition to EPUB 3 to better take into account the needs of dyslexic people.

Complementarity of audio and text in a mainstream use

It seems to us that what must be taken into consideration here is both the possible complementarity of the two modalities of access to the written word (optical and audio) for dyslexic people, but also the importance of offering these people services that are as close as possible to what is offered to the rest of the population.

Reading software built on the basis of Readium 2 will be able to meet these two requirements. EDRLab plans to offer both a display adapted to the specific needs of each dyslexic reader as well as audio playback by synthetic voice. These functionalities will be presented in the Readium mobile test readers (*R2 Reader for iOS and Android*, which will serve as example for commercial applications), but also on the Thorium desktop reader currently developed by EDRLab for general public use.

Beyond these technical requirements, the reading applications built on Readium 2 will be mainstream solutions, able to meet the desire to use the same methods of access to the written word as the rest of the population.

Regarding the specific needs of dyslexic children during schooling, Luisterpunt works with ADIBib, the accessible PDF production structure we mentioned earlier ,as well as with Transkript[15], a structure producing Braille, tactile illustrations and human voiced audio books and PDF adaptations. It should be noted that Transkript does not produce books in EPUB either.

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[15] https://transkript.be/braille-2/

NCBI (Ireland): EPUB in the back office and PDF or Word in distribution

The Marrakesh Treaty, known for the possibilities it offers for the cross-border exchange of adapted documents, has also greatly broadened, as we have seen, the audience benefiting from the copyright exceptions in many countries. This is the case in Ireland where NCBI[16], the library historically serving the visually impaired, has recently also started offering services to dyslexics.

NCBI has signed a cooperation agreement with the Dyslexia Association of Ireland[17]. The documents offered by NCBI are stored in EPUB and distributed in the format chosen by the dyslexic user. According to NCBI, the vast majority of requests are for PDF or Word distribution.

NCBI's proposals do not currently apply to textbooks. However, work is in progress to bring the organization closer to textbook publishers.

NCBI also offers dyslexic people access to the services of the american Bookshare[18] service. Bookshare services are organized on the basis of EPUB files stored in the back office and automatically converted into the format desired by the end user.

DZB in Germany

DZB, a library historically dedicated to the blind and partially sighted, has been authorised to lend books adapted to dyslexic people since January 1, 2018.

DZB has established contacts with organisations of parents of dyslexic children and teachers in the state of Saxony. DZB works specifically towards specialized classes for dyslexic students.

DZB will use Buchnacker[19], a solution developed by the SBS[20] (Swiss Library). This online project, which has been online from 2013, is now used in Switzerland by 2500 children.

Buchnacker's creation began in 2012. Special libraries Nota (Denmark), MTM (Sweden) and Celia (Finland) shared their expertise with the Swiss team. For the more technical aspects, SBS relied on Dedicon (the specialised library of the Netherlands). The download, in

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[16] https://www.ncbi.ie/
[17] https://www.dyslexia.ie/
[18] https://www.bookshare.org/cms/
[19] https://www.buchnacker.ch
[20] https://www.sbs.ch/startseite/

particular, is based on a Dedicon solution that manages the Daisy Online Delivery Protocol. The Buchnacker app is also based on a Dedicon solution adapted to the SBS recommendations.

Buchnacker's main objective is to awaken the pleasure of reading in young dyslexics.

At this stage, DZB has not modified its production lines for adapted documents. The immediate challenge is to enable dyslexics to benefit from resources in Daisy formats and this work appears to be an emergency for DZB librarians: the collections of audio books (in Daisy 2.02 format) and digital books (Daisy) must be opened so that dyslexics benefit of this ressources and parents do not continue to adapt books that have already been made accessible.

BACC: one EPUB validator per DZB

In parallel with these efforts to make Daisy documents available and with a significant amount of communication work, it should be noted that DZB is also very involved in the field of natively accessible publishing. By natively accessible publishing we mean the production and distribution by publishers of digital books with a set of useful characteristics for dyslexic people.

DZB has developed BACC[21]: an EPUB validator for publishers. BACC (Born Accessible Content Checker) is a project supported by DZB as a Braille and Daisy book production library that considers the production of natively accessible digital books as fully complementary to its efforts to provide written access for dyslexic people.

The EPUB BACC validator is based on ACE developed by the Daisy consortium. BACC is an online solution with a straightforward graphical interface.

The primary objective of DZB is, of course, to provide publishers with an essential tool to improve the consideration of accessibility on their production lines. But DZB also aims at a real rapprochement with German publishers. The objective is to strengthen cooperation in all possible ways.

BACC, the EPUB validator, was first presented at the Frankfurt Book Fair 2018.

DZB's approach, which brings together in the same roadmap the production and distribution of adapted Daisy documents and the work on natively accessible EPUB publications, clearly illustrates the benefits of standardization around the Daisy Consortium + EPUB 3 couple.

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[21] http://www.daisy.org/planet-2019-01#a4

Nota[22] in Denmark

Nota is one of the main libraries in Europe specialising in access to written documents for people who are unable to read due to a disability and, in particular, for dyslexics. Nota has recently joined EDRLab as a member.

Nota has opted for the development of an in-house application to meet the needs of its users, who are mainly dyslexic but also visually impaired.

This application allows the end user to make settings such as: font selection (including dyslexia font); font size adjustment; theme and contrast levels selection...

Nota has chosen to develop a home-made reading application in order to be able to implement all the functionalities considered useful but above all to benefit from a complete integration of the library's collections into the reading application.

The issue of integration came up again in several of the interviews we conducted. Professionals are looking for easy-to-use solutions and, whether for library loans or in a commercial context, they are attentive to the possibility for the end user to have a friction-free experience from the discovery of a desired book to its opening in the reading application.

Reading applications developed on Readium 2, which support the OPDS (Open Publication Distribution System) format, should thus allow both the search and localization of a book, as well as its reading in the same software.

The Nota application now distributes Daisy publications and uses the DODP (Daisy Online Delivery Protocol) distribution protocol. However, the back office is already centered around EPUB, whether for its own productions or for purchases from publishers.

This application is now also used by HBS[23] in Iceland.

Nota is currently working on synchronizing the human voice audio books in their collections with the presentation of the corresponding text in a Readium based application. Nota developers would like to study the possibility of integrating their library into Readium2 via an API so that an end user has only one application to consider.

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[22] https://nota.dk/om-nota/english
[23] https://hbs.is/

MTM in Sweden

MTM[24] is also a structure historically at the service of visually impaired persons, which has extended the group of its beneficiaries to all print impaired persons due to a disability, including dyslexic people.

The major role played by MTM in international cooperation in providing access to ebooks for print impaired persons is widely acknowledged and praised.

The whole digital text production available at MTM today involves the creation of a pivot file in EPUB 3 from which the various useful forms will be adapted. The production of these EPUB 3 files is entrusted to external service providers for cost reasons. The use of the EPUB is thus doubly justified by the interest of using the recommended accessibility standard, but also by the ease of subcontracting based on a well-documented format.

Of the more than 110,000 active MTM borrowers, the majority are dyslexic.

Dyslexic people who use MTM services use the mobile application "Legimus" developed by Sensotec[25].

Sensotec, Easy Reader, VoiceDreamReader

Three reading software programs were mentioned by a majority of the experts interviewed: Easy Reader[26], VoiceDream Reader[27] and the Online Daisy solution[28] proposed by Sensotec (used under different names).

Sensotec's Online Daisy solution is used by several libraries for the distribution of Daisy books for dyslexics: NLB in Norway, MTM in Sweden, Celia in Finland and Luisterpunt in Belgium. Easy Reader and VoicedreamReader were mentioned during our interviews by Nota in Denmark, NCBI in Ireland and LIA in Italy.

These mentions are important for this study since the three solutions, EasyReader, VoiceDream Reader and Online Daisy, support the EPUB format.

This is an additional element of the transition chain to EPUB that is already in place. Although in many cases it is found that distribution is done in Daisy format, reading software

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[24] https://www.mtm.se/english/

[25] http://home.sensotec.be/products/detail.aspx?id=746

[26] https://yourdolphin.com/products/education/easyreader-for-windows

[27] http://www.voicedream.com/

[28] https://sensotec.be/fr/product/online-daisy-livres-electroniques-livres-audio/

that can read EPUB are already widely used by dyslexic people using special library services.

EDRLab promoting the use of the EPUB for dyslexics

Weakness of commercial EPUB uses

During the interviews, very few of our interlocutors spontaneously mentioned the possibility for dyslexics to use commercially distributed EPUBs for easier reading.

This lack of mention may be explained by the fact that reading using commercial ebooks, in such a specialized context, may escape experts. However, this is not sufficient to explain the low awareness of these solutions and we believe that the real use by dyslexic people of commercially distributed EPUBs is indeed very limited.

The most frequently mentioned reading apps are able to read EPUBs and the commercial availability of EPUB documents is important in most European countries.

Several factors could explain this lack of use of trade EPUBs.

Lack of awareness of the possibilities offered by the EPUB

Reading solutions are considered as a whole and some of our expert contacts may not make a strict distinction between EPUB formatted ebooks and reading softwares used to read them. However, most generic readering applications do not currently offer the functionalities needed by dyslexic people. And these features are not highlighted in softwares offering some of them.

If specialized software are able to read EPUBs, their lack of notoriety does not contribute to an increase in EPUB reading by dyslexic people. From this point of view, the work in progress by EDRLab to implement useful reading functionalities for dyslexic people in Readium 2 (and in particular Thorium) seems essential because it will provide much greater visibility for this type of solution by integrating them into consumer reading software.

Validate the functionalities to be implemented in Readium 2

During the interviews conducted for this study, one of our objectives was to validate a list of functionalities specifically designed for dyslexic people, to be implemented in Readium 2 (see Appendix 2).

All experts interviewed agreed on the value of the proposal and none criticized the features, either to ask for more or to suggest that one of them was not relevant.

Nota's colleagues in Denmark indicated "This seems very complete".
The colleague from Bravo in Slovenia said "There is everything".

The only suggestion that was mentioned several times was the integration of catalogues (commercial or library) directly into the applications built on Readium2 so that users do not have to change environment and can perform their entire reading journey in a single interface: discovering a title, buying or borrowing, reading.

This consensus on the functionalities to be implemented in Readium2 is positive. It seems that the study work carried out to determine the list is recognized by our interlocutors.

It remains to be seen how to present these experts with a functional solution. We believe that it is on this basis that we will be able to obtain more precise feedback, and in particular on the relevance of the implementation of the functionalities which are considered.

Institutions still in transition

For a number of the specialized institutions, the transition to the promotion of natively accessible resources for dyslexics is still a nascent process. The relatively limited resources of most structures involved in this sector may lead them to concentrate their efforts on the most urgent requests and therefore neglect solutions that they may consider not yet relevant.

DRMs: the main obstacle to the use of commercially distributed EPUBs

For all experts who master the technical aspects, the weakness of the observed use of commercially distributed EPUBs is attributable to the lack of knowledge of these possibilities as we have already mentioned, but also to the widespread presence of hard DRMs that prevent the specific usages required by dyslexic people.

Basic features such as the ability to play on spacing (between words / letters / lines) are not present in any reading solution that supports DRMs in commercial EPUB books.

The possibility of accessing some EPUBs without DRM is "hidden" by EPUBs with DRMs: a single negative experience is enough to permanently discourage the potential user or their helpers. For a potential dyslexic reader or the people accompanying him, having to sort between usable EPUBs and those unusable in a specialized reader because of a DRM lock is an impassable obstacle.

We presented the considerable advantages of the LCP DRM in this area and our presentation was received with enthusiasm but perhaps also a certain impatience: for our interlocutors the question of access to reading for dyslexics is an immediate issue. They often work with children and their interventions are of an emergency nature.

When the first truly accessible reading applications based on Readium 2 and LCP are released, a significant amount of communication work is to be expected for dyslexic people. The importance of the network for the care and support of these people in Europe is very positive in this respect.

Both European experts and those with whom we had the pleasure of exchanging views for this study should be provided with specific information. We have no doubt that if this work is done they will very quickly take over the very interesting possibilities offered by the EPUB for dyslexics.

Expand our thinking beyond dyslexia?

For the present work, we have deliberately limited the scope of our reflection to the issue of dyslexia. However, during the various interviews, the question of other Specific Language and Learning Disorders, also known as "dys" (dyslexia, dyspraxia, dysphasia...) was often raised by our interlocutors.

This extension could also be a good argument for the promotion of EPUB. Indeed, if PDF can be considered as a suitable response to the often urgent needs of dyslexic people, the needs for access to ebooks for other categories, such as dyspraxic people, fully justify the use of a semantically highly structured format such as EPUB 3.

In conclusion

As we believe we have shown in this document, the two main obstacles to the massive use of EPUB by dyslexic people are the issue of DRMs and the lack of a mainstream reading solution offering advanced text adaptation features.

The ongoing work at EDRLab around LCP and Readium 2 will remove these barriers and offer the power of modern digital publishing technologies to dyslexic people, opening up a completely new field of possibilities.

Some suggestions from the experts interviewed for the production of this report may be considered in future work around Readium 2:

- support for the Daisy format, to facilitate the transition phase;
- automatic integration into catalogue applications (libraries or bookstores);
- management of a synchronized text-audio playback (media overlays in EPUB language) for specialized libraries offering digital books with synchronized human voice.

Finally, let us note the importance of communication to ensure the success of ongoing developments: for all the experts with whom we were able to conduct in-depth interviews, communication with dyslexics is of crucial importance.
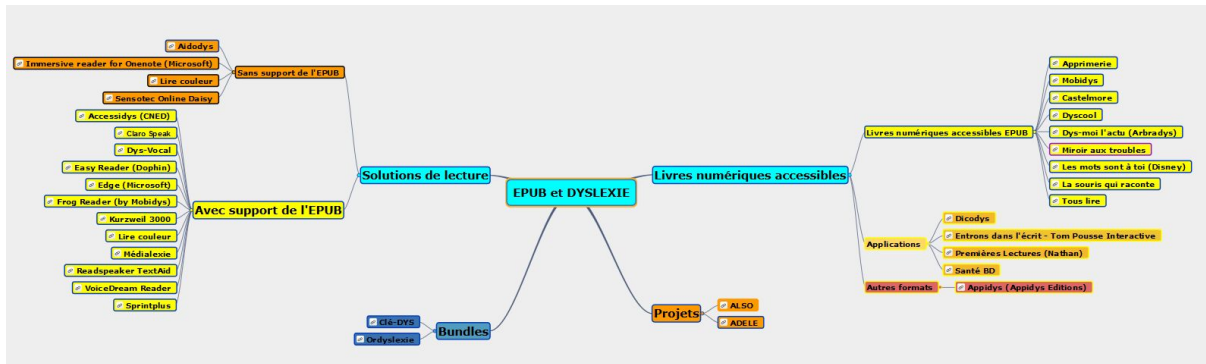
Some available solutions do not currently meet dyslexic people due to a lack of notoriety. This is true of the PDF textbook proposals, some of which are very recent. This is true for the provision of audio books in Daisy format produced under copyright exceptions which, in many countries, has only recently become possible. And it is true, finally for books in EPUB format distributed commercially or by specialized libraries, whose characteristics are very interesting for dyslexic people.

The technical solutions provided by EDRLab with Readium 2 based applications and the LCP DRM will represent a historical improvement in the conditions of access to written material for dyslexics. We believe that they can also be a key lever for conducting a communication campaign with the people concerned and those who accompany them.

Appendix 1: Features to be implemented in Readium2

	Expected function	Priority
1	Change the font size	1
2	Choose the font (with specific dyslexia font)	1
3	Change the spacing between characters	1
4	Change the spacing between words	1
5	Change the spacing between lines	1
6	Apply an alternating frame to distinguish the lines	2
7	Synthesis voice for continuous / on-demand reading for one word	2
8	Allow or prohibit hyphenation	2
9	Change the background/text color	2
10	Flag text (iron on the left)	2
11	Change the margin size	3
12	Change the number of visible lines	3
13	Highlight punctuation by coloration	3
14	Highlight syllables by coloring	3
15	Suggest a reading rule to follow the text	3

Appendix 2: EPUB map and dyslexia

Source: https://framindmap.org/c/maps/618926/public