This paper like to look at the development of IST Austria Library services from the idea of having an e-only library to the actual state of a hybrid library and how the services have to change in this environment. After giving an overview of the actual situation I like to point where we discovered room for further improvement with focus of your electronic services like the repository and our library catalog.

The idea of an e-only library
IST Austria\textsuperscript{1} was officially opened in 2009 but certainly the planning for the institute started a bit earlier. The mission\textsuperscript{2} of the institute was from the beginning to strive for excellence in science and establish an excellent graduate school. When the institute open only computer science and evolutionary biology where established. Today the covered fields contains: chemistry, computer graphics and vision, cryptography, evolutionary biology, mathematics, molecular biology, neuroscience, physics, plant science, statics and the theoretically computer science.

In 2009 Christian Gumpemberger wrote the first concept for the library. At the beginning of the institute was the idea that nowadays a e-only library can fulfill all the needs of scientists in area of science and technology. I was hired with the mission to build this e-only library but from the beginning under the condition that the library mainly has to fulfill the user needs.

When I started in 2009 around 50 people (including administration staff) worked at IST Austria the library provided around 150 e-journals and no books. Today nearly 300 scientists and around 140 persons in scientific support and administration are working at IST Austria. In the graduate school of the institute are in between 100 students who are fully hired scientists (and included in total number of scientists). The increasing size of the institute and researchers from more different fields certainly lead to a broader variety of working styles. For different reasons the library services developed in a different way as planed at the beginning. I like to take a look on the reasons, why we have now around 1000 printed books and not a high investment in e-books at the moment instead of being an e-only library.
Development of digital infrastructure at IST Austria
Since I joint IST Austria in May 2010 the infrastructure for digital services was developed. Shortly after I arrived we implemented the open source link resolver Doctor-Doc. The knowledge base of the link resolver is directly the Electronic Journal Library (EZB - Elektronische Zeitschriften Bibliothek). The EZB is a cooperative database where over 620 libraries and research institutions catalog their holdings. They add new titles cooperatively and update the data jointly. Each member can administer and add the locally licensed information. The database contains online journals on subscription and free e-journals (where the definition is not equal to Open Access journals).

Technical maintenance and further development is done by the Universitätsbibliothek Regensburg. Lucky we got a free-hosted service by the Swiss association Doctor-Doc. Doctor-Doc forwards the research to an article (if it’s part of the holdings) or to an order from for document delivery. The librarian backend allows also to track the status of the orders and place directly orders to SUBITO, an german document delivery service.

Very soon we needed publication lists for all of our scientists, which should be consistent formatted for an evaluation report. We decided to go for a publication database, which allows us easily to undertake similar tasks in the future. After trying out different options we decided for bibapp - a software developed by Universities of Illinois and Wisconsin.

In 2011 we decided to buy the first printed books for the library (only a very small number). We started to catalog them in Library Thing. This web-based service allows private persons to catalog their book collection but can be also used by also organizations. Library Thing mainly provided a list of books, which are available but provides no support for library processes like borrowing or acquisition.

Figure 1: Library Thing title list for old IST Austria catalog
In the same year we started our repository, because of the need of versioning we choose EPrints developed by the University of Southampton. At this time DSpace didn’t support versioning but it was already announced that it will come soon. We decided not to relay on a promised feature. After some customization our publication database allows the direct import of papers into our repository.

The storage and publication of research data become a hot a topic and we started in 2012 a project which should look which infrastructure the library can provide to support the scientists to fulfill this new request of funding agencies.

In 2013 we focused on the improvement and further development of our existing services specially the publication database.

In 2014 we are switching to to real integrated library system. We choose koha because it is web based and for this open source solution a lot providers for commercial supper are available. Also we hope to start our research data repository.

All this projects were done with a minimum of resources. In 2010 I started alone and in 2011 i got support of 1/3 of a developer the other 2/3 he had to work for other departments. A year later an additional librarian was hired. This year (2014) we got another half time librarian so that the whole library is run with 2.5 FTE librarians and supported by 1/3 developer of the IT department.

**E-only - Mission Impossible?**

The market situation of e-journals was very well established. All journals in relevant fields (for the institute) are available electronically. Additionally the scientists are already used to relay on the electronic version of the journals. This means that in the area of journals no complains showed up when the decision for e-only was taken. Only a few magazines and newspapers are now provided in print in the cafeteria. This part of the mission could be counted quite easily as a success.

More complicated was the area of books. There we discovered five main obstacles to establish e-only services:

1. **Tradition**

   The book has a very long tradition in teaching, learning and scientific research. Even in science, so a lot of lecture and basic information is contained in books. In mathematics for example research is without the basic books of the field not possible and a basic print library of mathematics is a must have.

2. **Work Process**

   Even if the computer and text software is playing an important role a lot of scientists still like to have a book aside to lookup special information fast. Also it is much harder to work with a printed out book as it is with a printed out article.
3. Not available

Maybe the biggest problem of all is that some important books are just not available to buy for libraries in an electronic form. One example is the textbook from Garland Science - the “Molecular Biology of the Cell”. Garland Science is an imprint of Taylor & Francis who is known to offer a wide range of electronic books. Our library is holding at the moment 5 copies and because it is a basic textbook we would be quite happy to provide it to all of our students with the possibility of an electronic copy. We asked different aggregators but no one was until now able to provide us an electronic copy. Also there is no one available direct from the publisher. As long not all-important books are available in an electronic form there is no way for a library to go 100% e-only even if they want to.

4. Price Models

Another big problem is the situation about price models. Printed books could be ordered one by one when they are needed. The electronic market is not as simple as that. There is a wide range of different models; let's take a look at them.

Some publishers only allowed buying packages, which contains all books of a subject area of a special copyright year. These packages are binding a high amount of money for the books of just one publisher. They are only interesting for libraries holding a wide selection of titles for smaller institution with a very special interest which is maybe also smaller than the defined subject areas this packages are a real problem because they have to buy much more titles as they would normally do. Certainly the packages contain discounts but even than a package could be much more expensive than the normal spending for material of this publisher.

Another model is offered by a lot of aggregators’ offers books from different publishers but in many cases only with a DRM restriction, which restricts the interoperability or makes a special reading software necessary. Aggregators are allowing in general two basic models “Pick & Choose” (which is also offered by some publishers) and the “Patron Driven Acquisition”.

**Pick & Choose** is the adaption of the classic book purchase model you can just buy what you need. Some publishers’ request a minimum purchase volume before you can add other books that are needed.

**Patron Driven Acquisition** (PDA): This model allows adding a wide range of books to the catalog without purchasing a ownership. First times a book is accessed by users (e.g. first 3 times) it is only borrowed (called a **short time loan**) for an smaller amount of money (e.g. 10% of the price) the fourth time the book is purchased (the library has to pay 100% of the price) and the library got ownership, what means further access to the book is free. Books are got purchased automatically up to limit, which the library has to set up. First libraries already discover problems with this model
because there is not enough budget for all request e-books. (Anderson 2011)

A similar approach is the **Evidence Based Selection** (EBS) model where a sum is paid in advance to access all books from a defined range of years (e.g. 100.000 € for 1999-2013), which gains unlimited permanent access to all books of this year. At the end of the year the spend sum can be used to buy e-books from this year the usage data of the year can used an indicator but is not binding. The purchased books can be also access after the contract the canceled all other content will not be accessible anymore. Elsevier offers this model for example (Chen 2012).

And certainly the very successful model used for journals the **subscription** model, has been adopted for e-books, too. It is available for individual book (most times for reference works), book series or a whole catalog of books of a publisher or provider.

At the same time also subscription models on a individual base are coming up (e.g. from amazon (Brustein 2014) or different publishers (Reid 2013), how is will be interact with the model for libraries in future is not clear.

Over the time more and more new access models are approaching.

The problem of all this different models is that no one of them cover books from all publishers. Libraries have to deal with different models, but this makes is quite difficult to calculate the necessary budget for e-books. Also the budget, especially for small libraries must be higher and the purchase can’t be so specialized. The complicated market of e-books slows down the addition rate.

5. **Different Usage**

The last problem is that the usage of books is different to the usage of journals. Books are annotated with post-it or important information is underlined (hopefully not in library books). Many books containing much longer text and this are also different consumed as short texts.

And finding information afterwards in a book is also different from finding an article again.

Different e-book readers like the kindle or the iPad have started to support this new usage models but there annotations are often bond to one software (or in the worst case to the device) and they are not interoperable so that all the work would be maybe gone if the software or hardware and not continued.

Additionally on tablet computers like the iPad are different software products, which are developed to support the working process of the scientists.

At the moment there is so simple solution for going e-only but the market is fast developing so maybe in a few year the answer is as clear as for journals but only if user behavior is also changing.
The library catalog as import interface
Beside the challenges from the e-books itself there are further challenges for a (new) library. The library has not only to buy the e-books; certainly the user has also to find them. Therefore the library catalog or a discovery system must serve as a signpost. Our first library catalog was Library Thing, which can be used also by institutions. Library Thing offers a quite limited set of features. For example Library Thing is optimized for printed books but don’t has the ability to link external objects. With this choice of the library system it was not possible to integrate e-books in a convenient way. For creating a list of all purchased e-books Library Think wasn’t the best solution.

Figure 2: Title view in Library Thing

To support an hybrid approach a new library system must be implemented. An other reason was that the actual lending status of a book is not available for the users, which was also highly requested by our users.

The project of a change to an real integrated library system (ILS) would need quite an amount of resources. That's why a new library system had to wait until this year. After considering different options we decided to implement Koha. Koha is a web-based integrated library system supporting different resource types including books and e-books. At the same time we got support for processes like acquisition which was needed with the grows of the library. For our users a main feature is the self-checkout system, which allow them to see which books are on shelf.

The new library system is a important step on the way to a digital library.
E-only library? Not yet

At IST Austria the users still requested printed books for different reasons. The original plan to implement an e-only library is at the moment not possible to accomplish. The different usage model and availability make it necessary that our user still like and need printed books. We know that usage, working process and reading of scientists are already changing also for books (see also CISBER 2008), but it is not totally changed yet. This meant that we still need a hybrid library to fulfill all user needs. The mission to build on e-only library has to be aborted but a restart is possible in future. Next steps will the trial of different aggregators to provide a wide range of titles and from different publishers in a digital format. If the scientists like books so much, why we put so much afford in it? At the same time the scientists have the dream to have access to everything, from everywhere at every time. Certainly we will with a commercial model never be able to do so but we try to give them the feeling that there dream nearly can come true.

Is the Library as Space still needed?

Another point, which was overseen in the original planning to develop an e-only library, was the function of the library as space (CLIR 2005).
In our case it was mainly the function as a quite working space because in the planning of the institute areas where scientists can discuss and working are considered but quite working areas specially for PhD Student, who are working in 6+ person offices, are lacking. In a user study done in 2012 around 25% liked to have comfortable seating options and 25% office liked space but most important was a silent area.

In the moment we are offering 2 office like work places and two sofas for comfortable reading, later this year the library will move and we plan to offer more desks because we see that they are very well used. We expect that in the next year the need for spaces like that will increase like in other places.

**Open Access & Repository at IST Austria**

In 2012 the president of IST Austria Thomas A. Henzinger gave a testimonial for the Open Access webpage of the FWF\(^{12}\). He said:

“At IST Austria we support the self-archiving of scientific work and encourage publishing in Open Access journals, in order to make the results of our research accessible to the broadest possible audience.”

One year later IST Austria published an Open Access Policy\(^{13}\):

“IST Austria is committed to provide unrestricted and cost-free online access to scientific publications for all users and researchers as widely as possible.

The main goal is to increase the visibility, use, and impact of research output, and hereby generate added value for the scientific community.”
IST Austria committed to support the green and golden road. The green road is supported with the IST Austria Repository (PubRep) where scientists themselves can store already published paper, depending on the author contracts most time in a different version (post-print or pre-print). The golden road is supported with a Open Access fund to subsidize Open Access author processing charges (APCs) with 50%.

The current situation of the repository is that we use some extensions and did a little customization; the software basis is EPrints, which was developed by the University of South Hampton.

The usage of the repository is not very high at the moment; it is mainly sided for technical reports in the area of computer science. There is question must be asked what we are doing wrong or “Can repositories be fun?” for the scientists.

**Can repositories be fun? - Thinking about the IST Austria repository**

Two issues, which can make repositories no fun, can be identified. This first one is one of librarians best friends. Or to say it shorter: “Our best friend can be our users biggest foe”. This “dog” of the librarians looks for users like a really nice helpful friend - until they get bitten. The name of the dog: “Metadata”.

When users hear about the search possibilities, it sounds very nice for them but when they asked to enter all the data that is needed if feels for them like they got bitten. Our repository has for example three screen pages of metadata including hidden fields that are optional. Scientists can feel overwhelmed or also attacked by such amount of data, which should be entered by them. But what should we do? A classic answer would be improving the usability. But we should do more, we should improve the user experience. But what is the difference?

Usability describes the ease of use and learnability of a human-made object e.g. a webpage. User experience (UX) (User Experience 2014) involves a person's behaviors, attitudes, and emotions about using a particular product, system or service.

Let’s have a short look at Research Gate, a social web page for scientists, which allows publishing publication lists. Our repository looks quite less attractive compared to it.
But how we can change this? Maybe we have to worry more about design than we have in the past. The answer of the most libraries to improve repositories usage is to offer full service. This means that we just do everything for the scientist. Another option is just to live with a nearly empty repository. The nearly empty repository is at the moment our situation but we don’t like to live with it. That’s why we like to look into how we can improve our system and make it more attractive to use. To make metadata as less hurting as possible we like to auto fill every information we already know and hide really all optional fields. Also we start thinking, if we can reduce metadata fields, which is maybe one of the hardest option for us as librarians because we want to be prepared for all future use cases. A further good option is a mixture of minimal user data combined with a library service. And as decided before an actual redesign could be very helpful.
A redesign should consider a responsive web design. Responsive Web design is able to display content on different screen sizes. Repository are in general optimized to display on desktop computers but if they visited on smart phones or even more interesting on a tablet PCs as reading device. A responsive web design will reorder the elements on the webpage depending on the scene size and optimized for it. This could be done for example with an CCS Framework like Twitter bootstrap\textsuperscript{14}.

Another very important step would be the integration of the repository in other services of the institution. In our case there is a integration with our publication database PubList\textsuperscript{15} which is based on the open source software bibapp\textsuperscript{16}. The publication database is able to support scientists on the task of self-archiving of publication with different functions. It allows scientists direct to archive the papers, which are already entered in the publication database without entering any metadata again. The metadata and the file are sending via the SWORD (Simple Web-service Offering Repository Deposit) protocol\textsuperscript{17} into the repository. The standard version of the protocol only allows sending Dublin Core\textsuperscript{18} metadata together with the files. We extend this possibility with sending a RDF file based on BiBo\textsuperscript{19} which contains all metadata files stored in the publication database.
A second feature is the integration of the SHERPA RoMEO list\(^20\) into the publication database. Every scientist can create an archive analysis where there can distinguish how many publications can be stored as a pre print version and post print version (see figure 7) also during the uploading process the sherpa romeo information for the journals is presented.

**Figure 7: Archival Report with Sherpa Romeo Colors for Thomas A. Henzinger**

But why have we chosen two systems, which are connected and not one repository, which contains for some publications the metadata only? This decision makes it much easier to have the official publication list and additional literature, which should not show up in the publication list much easier. Some of our scientists don’t like that older visions of a paper (like a technical report) shows up in their publication list also we like to use the repository in the future for gray literature (e.g. annual reports and project reports).
The overlaps between these two systems are the Open Access publications. In the future we like for example to build additional services on the base of the two systems, which makes them even more attractive for our scientists. We like for example generate publications list direct for the data of our publication database for the webpages of research group and individual scientists. If an Open Access version of an article is offered in our repository (or in any other subject repository), we plan to offer a direct download link.

The European Union request in their regular project reporting information about publications they funded. The reports should be supported by the publication database. For the short description of the research groups on our webpage, we presents a list of the most important publications, if our publication database allows to mark this publications in some way also this lists can be generated out of this data. Also we are thinking about integrate citation reports direct in the publication database but this is also a political discussion if this is wanted. This discussion hasn’t stared yet.

What have we learned about our and other repository service? At the moment out of the box repositories are not very good in satisfying the users. One of the reasons is that a modern design is more important than most of librarians are thinking. We are still focused on functions and prefer to add new functions to our systems than to investigate a redesign of the look and feel. We are always in the conflict to make it as easy as possible for our users versus generated the best possible metadata. The tendency to add a field that can be maybe useful in the future, without keeping in mind that a longer list led to create the feeling to be overwhelmed for our users. The development of our system has to focus on real user needs not on what we think would be maybe useful for our users. An integration with other important systems can created added value for our users and for us.

We should always have in mind that the best repository is a used repository.

**Future development of the library**

Keeping our experience with the e-only library and repositories in mind, the question is what are the next steps for the development of library services at IST Austria.

At the moment mainly text bases resources (electronic or printed) are in the focus of the discussion. Additionally different video bases resources like the Journal of Visual Experiments (JOVE)\textsuperscript{21} and video trainings for software and soft skills (like from lyndia.com) are discussed to be added to the
portfolio of the library. A new question is how these resources can get integrated, can this be done with the library catalog or is as addition a discovery system needed.

Open Access to publication is already a difficult story and now more and more funding agencies are also asking for open access to data produced in the funded projects and used in publication to document the project. The EU added Open Research Data (European Commission 2013) as pilot in the new funding program Horizon 2020 and also our national funding agency the FWF request the publication of the data. The researchers have the problem that there is no recommendation where, what and how this data should be published. In some research fields a data sharing practice is already very well established while other fields don’t have start thinking about data sharing (Porsche 2012). We decided to implement a platform, which allows scientists to publish their data if no other established platform for this type of data is available. Because of our limit resources we decide to develop a system on the same base as our repository for publications - EPrints. Library is Great Britain has already used and developed this system further as part of JISC Research Data projects.

An exchange for all activities in the area of publications and research data is organized as part of the national project e-infrastructures Austria, which is founded by the Federal Ministry of Science, Research and Economics.

“The objective of this project is the coordinated establishment and development of Repository Infrastructures for digital resources in research and science throughout Austria.“

In the project all Universities and a number of research institutions are working together to build a knowledge networking for a coordinated exchange out the current and upcoming challenges in the areas of Open Access and Research Data.

What else can be done to establish e-services at IST Austria? In the last years we focused on the start of new tools and implementation of the processes. Now we have to improve internal marketing and user documentation to make the tools more useful for the users and create a better understanding.

Even if today it is not sure which trends are next, it is sure that there will be something what makes it never boring to work in the libraries. The road we have to take until libraries can be easily e-only is still very long but we will see if it someday works for our users.
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