



From access to accessibility

The university library
of the future in the
scholarly communication cycle

Colophon

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Abstract

This report is a result of the Utrecht University Library Policy plan 2015–2017. In this plan the library expresses the ambition to support the entire life cycle of research, divided in the stages Research, Create, Share. This report elaborates on that ambition, by exploring these stages in relation to the changing world of scholarly communications. It alternates between two perspectives: the researcher's viewpoint and the library's position. The guiding questions are 1) how does the changing context of open science affect researchers' work and 2) how will the University Library be able to support them with its expertise and knowledge? The first part of the report introduces the developments in scholarly communications. The second part explores how these developments affect the stages in the research cycle. Throughout the report, quotes by Utrecht University faculty offer comments on key observations.

Fundamental in this report is the idea that research output needs curation in the open field of scholarly communication as much as in the traditional one in order to function optimally in all stages of research. This report defines these stages as Research/Discover, Research/Fund, Create, Share/Publish, Share/Assess, Share/Connect. It sketches a future in which the library is the institutional party that takes responsibility for the domain of curating and managing knowledge and research information. It also outlines opportunities for collaboration within the university. As such, it supports discussions on the development of research support services in the area of research information management, both within the library and within the university at large. The second part of this report, in which the stages are explored, is divided in stand-alone paragraphs, which can be read or discussed separately.

Currently, scholarly communications change at a very rapid pace. This report was finished in June 2016 (for the original Dutch version, prior to faculty consultation, see [Dutch version](#)). At the time of publication, July 2018, we can conclude that developments have continued at such a rate that some parts of the scenarios explored here are already overtaken by reality. The major scenarios discussed here, however, are still valid, and will hopefully still be of value to library professionals.

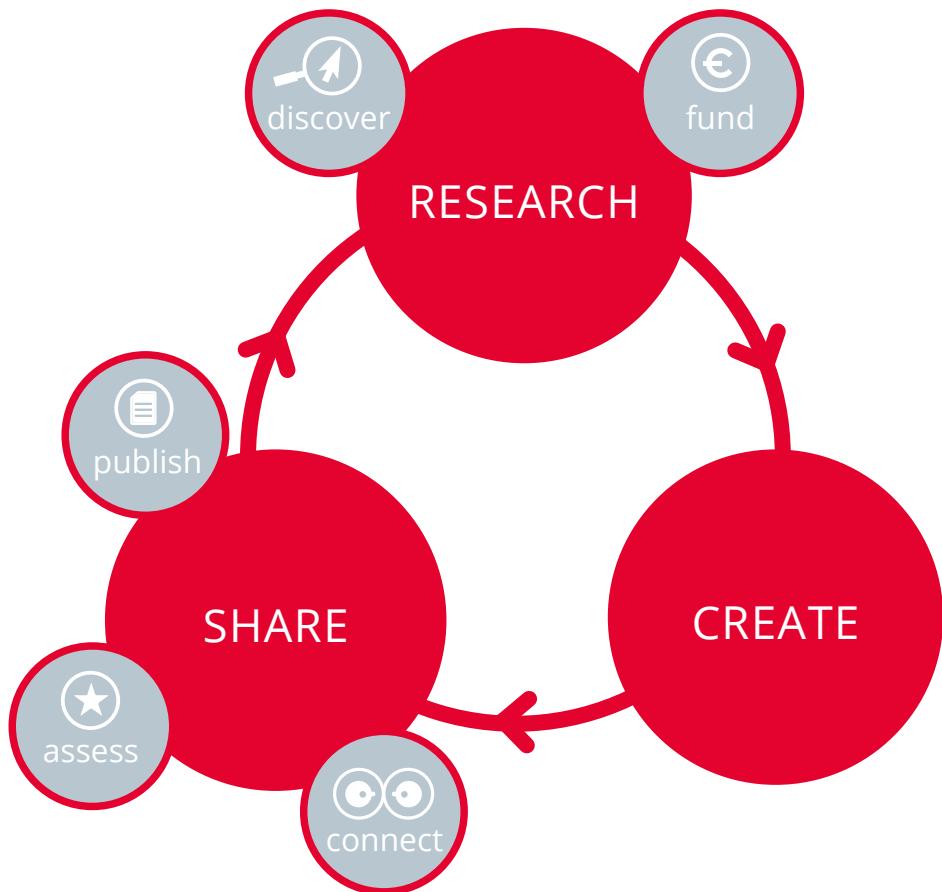
The university library in the scholarly communication cycle

A necessary exploration

In 2014, Utrecht University Library conducted an investigation into its future. We formulated a Policy Plan for 2015–2017, based on a vision of the world of scholarly communication in 2030.¹ The plan explores ‘changes in the scholarly communication cycle and in research processes, in academic education practices and in consumer technology’.² We felt the urgency of this exploration since these changes will have a significant effect on the services of academic libraries in terms of both research and education. The Policy Plan assumes that some traditional library tasks will become redundant over time.

The Policy Plan envisioned a response to the new situation, and stated the library’s ambition to be capable of supporting the entire cycle of scholarly communication by 2017: ‘The library offers professional support to researchers at every stage of research, from researching an idea to publishing results and everything in between’.³ We can present this support as a three-stage cycle: Research, Create, Share (see Fig. 1). The library believes that ‘[t]he researcher will increasingly have to deal with aspects which do not naturally align with [her] core competencies and needs’.⁴

Fig. 1: The three-stage scholarly communication cycle



In fact, Utrecht University Library has been working for some time on developing support for all stages of the scholarly communication cycle. For example, for the past fifteen years the library has supported the publication of Open Access journals and has also experimented with a service for preserving research data that has subsequently been implemented at a national level. Worldwide, other research libraries are similarly expanding their services throughout the life cycle of research. It became clear that further development of this component of the Policy Plan was necessary if we were going to realise the University Library's ambition.

The rate at which online scholarly communication is developing and the increasing complexity of information services require both short-term steps and a long-term vision. This report, which was commissioned by the University Librarian, investigates what the vision for the future contained in the Policy Plan means for the services the library offers to the university community. If we extrapolate from current developments in the scholarly communication cycle, how will the world look fifteen years from now? What are lecturers and researchers likely to need? And how can the University Library shape its services to meet their needs?

'When so many developments are happening, you can't follow all of them if you want to stay sane. That's why the library, in its service-provider role, needs to approach researchers much more proactively. It needs to be visible.' – Madelinde Winnubst, Researcher in the School of Governance – Faculty of Law, Economics and Governance

Redefining the role of the library

The vision of academic support in this report should provide a picture of what the future library will actually look like. A coherent conception of its services and consistent communication about them are important for a variety of reasons. Currently, some of the library's expertise is untapped.

We have noted that academic staff primarily think of the library as a place to study, a depository for books and a place to access scientific information.⁵ For that reason, they don't always approach the library for support. The library is no longer an automatic part of the strategies employed by researchers to access academic literature. So why would a researcher consider using the library? A clear answer to this question will help the library to better deploy its expertise to support academic staff.

Moreover, a consistent narrative about the library's expertise could help to strengthen collaboration between the library and other Utrecht University units and avoid overlaps. A clear vision of the value added by the library would make it easier for Utrecht University and University Medical Center Utrecht to have a conversation about the library's role in research and education. And how do we fit in with other Utrecht University units, such as Academic Affairs, Information ans Technology Services and the faculty Research Support Offices?

Finally, it should be noted that the ambition to 'support the entire cycle of scholarly communication' could easily lead to an abundance of services and tasks. Right now, at a stage where the University Library is having to combine traditional tasks with innovation, it is important that we make informed choices through consultation. A vision of the library's role in supporting academia can be used to shape and contain plans, innovations and the provision of services.

'Data, ORCID, peer review tools ... I didn't realise the library was involved in these things. That could be communicated better.'
– Koen Sebregts, Researcher in English Linguistics – Faculty of Humanities

'Take research data ... Institutions have a data manager to help with the preservation of data, adding metadata and giving advice. There needs to be some coordination between these people and the data specialists at the University Library.' – Pim Huijnen, Researcher in Digital Humanities – Faculty of Humanities

From access to accessibility

This report confines itself to the developments in the research cycle which present challenges to researchers and lecturers and where the University Library can add value. It assumes that scholarly communication increasingly occurs in open and online environments; the fixed components of the scholarly communication cycle (creating, preserving, sharing, assessing, searching and finding) are supported by online environments and tools that are developing rapidly. This calls for new ways of working, and new ways of dealing with scientific information. Obviously researchers and lecturers already experience profound changes in scholarly communication, but the expectation is that these will become even more far-reaching and follow each other in quick succession, driven by the demand for open science and technological developments.

Facilitating access to scientific information is traditionally seen as the mission of a university library. That mission unites the traditional core tasks of the library: selecting, acquiring, curating, making available, preserving, and stimulating information literacy. In short, this expertise amounts to saying that the library understands how information ‘behaves’ in the cycle of scholarly communication and how information can best be organised to optimise its use. This is expertise that we will still require in an open and online situation. Accessibility would appear to be guaranteed in an open environment, but it gives rise to different areas of concern to a traditional situation. The challenges faced by researchers require a reconsideration of competencies and expertise within the academic community.

'The University Library should communicate better. Show the faculties how it works, using specific examples. Practical support is very much needed.' – Ton Hol, Head of the Department of Law – Faculty of Law, Economics and Governance

The researcher in the scholarly communication cycle

A scenario: scholarly communication in 2030

It is entirely possible that in 2030, the year which was the focus of the 2015–2017 Utrecht University Library Policy Plan, all scientific publications will be open access, data sets will in principle be freely accessible and open education will no longer be a future goal, it will be a reality. After open access and open data, open science is increasingly appearing on political and administrative agendas.⁶

Open scholarly communication has undeniable benefits for collaboration and visibility. Open sharing promises to make academic research more efficient; if data sets and protocols were reusable, this would save time and money. Making information and best practices available renders such reuse possible, while also ameliorating the verification and falsification of research.

Open scholarly communication would also further the transparency of working methods, and protocols and data management will enable more rigorous peer reviews. Openness can give rise to collaborations between new disciplines and institutes. It will also make it simpler to reach more peers at the same time,

and to keep track of what is happening within a subject area and what is being developed through research. The increased visibility of research will allow it to reach new and unexpected target groups.⁷

At the same time, the increasing openness of research on various fronts has profound consequences for the daily work of researchers and lecturers. This concerns the concepts of publishing, collaboration and project funding, promotion and the measurement of impact and reputation. These topics are developed further below, including assumptions about the implications of openness for researchers and lecturers.

'In the academic world, certainly in our biomedical corner of it, there is far too much competition, at both the national and international level, to simply give your valuable unpublished data away.'

– Jos van Putten, Research Director and Vice-Dean – Faculty of Veterinary Medicine

On the new way of publishing

In an open academic world, scientific information can be openly shared at many different times in a variety of forms and media. Parts of the research process for which openness was not previously the norm, such as peer reviews and data sets, will be openly accessible. Educational material will be shared and developed in open environments. This openness has consequences for what we mean by ‘publishing’. The essence of open science is the constant sharing of scientific information. The physical form and timing of publications will therefore change. And the definition of ‘publishing’ will change too: the open and online dissemination of scientific information in all its forms will henceforth be considered publishing.

For online ‘sharing’, new rules will apply. In the traditional information cycle, information is distributed along the pathway author – publisher – university library. Generally speaking, the publisher takes care of distribution and visibility and the library ensures findability and long-term preservation. These traditional roles in the field of academic publishing will be changing. Academic publishers will expand their package of services in the information management area. They will offer platforms, tools, apps and systems that each support different stages in the research cycle.⁸ And other parties too will supply such services, from new, innovative, ‘open’ publishers and research libraries, to market operators such as Google.⁹

> All of this will result in researchers having access to a greater range of publication options and various kinds of infrastructure, of which the functionality, quality and reliability will not always be clear to them.

These parties are also developing new revenue models. Earnings will no longer be generated solely through subscriptions and institutional memberships; they might come from imposing Article Processing Charges (APCs), or using data for marketing. Costs incurred by researchers will be covered by a variety of sources; sometimes they will be paid from a project budget, sometimes by an institution, or sometimes by co-authors.

> It will require researchers to pay extra attention to arranging funding for publishing and infrastructure use.

When more information is shared openly during a research project, it is obvious that research funders will require increasingly detailed strategies for sharing this information. Currently they require data management plans (DMPs), which set out a strategy for describing, sharing and preserving research data, or alternatively an open-access strategy for the anticipated articles. In the future, the funder may set requirements on all types of ‘publications’ that are expected to occur in the course of the research.

> To meet these requirements, a researcher describes at an early stage of the research what information can be expected from the project, how that will be funded and what the accessibility and preservation arrangements will be.

Because research will largely be happening in open environments there will be a greater emphasis on ethical and legal issues, and at an earlier stage of the research process. After all, not all information can be made accessible, for example for privacy reasons or commercial interests, or due to patent protection.¹⁰

> We predict that the complexity of restrictions, including licence restrictions, in an open, online environment will require extra attention from the researcher.

Dan Hassler-Forest, Researcher in Media and Performance Studies – Faculty of Humanities, writes blogs and refers to them in his publications with increasing frequency. His blogs provide an ‘intellectual interpretation, a reaction and reflection from a humanities perspective on processes that are now moving at an extremely rapid rate. This can provide a particular angle that ultimately results in an entire article.’

‘The University Library is aware that things are becoming increasingly complicated, that the range of possibilities is growing. It would be great to know someone who could help me work out what the differences are and what the best option is. I can see a guiding role there for the library.’ – Mathilde Hagens, researcher in Marine Biogeochemistry – Faculty of Geosciences

On online collaboration

We have observed that the new form of publishing will require a new way of working. In an open field, a researcher publishes not only at the final stage of the research, but throughout the research cycle, in a variety of forms and on various online platforms. Digital tools, applications and platforms will increasingly affect academic research and collaboration. Research processes and work tasks will be more collaborative – and will therefore be more complex.

> *A publishing researcher must be able to deal with this online complexity.*

A related point is that researchers primarily work in an international context and working online facilitates that. Internationalisation is further strengthened by the increasing specialisation of research (peers with a similar specialisation don't generally live nearby) and by upscaling: increasing amounts of research take place as part of long-term projects that go beyond the institution. The way academia is organised is therefore more affected by external and international funding than in the past.

> *Through internationalisation, researchers are faced with a broader field of funders and research cultures. Communication with peers and the organisation and administration of research and projects will become more complex and time-consuming.*

We predict that academic education too will come to be organised in an increasingly international way: universities will combine internationally organised courses with local curriculums. The rise of online teaching, too, complicates the lecturer's job. A variety of digital tools, sources and platforms support blended learning. There, students can find course material, work together, and receive feedback from each other and from the lecturer. Open education is common. Online courses and teaching material are freely accessible, for anyone who wants to learn, but also for sharing with other lecturers.

> *That will require university lecturers to assess and harness the technical possibilities (both to share their own material and to find material from other lecturers) while bearing in mind the licensing restrictions on certain material.*

'The power of social media is its dynamism: it is never final, you can always change things. You can update something if you have a new insight. Developments in Digital Humanities are moving particularly fast, whereas traditional publication media have a long lead time. I find out new information and research results through social media.'
 – Pim Huijnen, Researcher in Digital Humanities – Faculty of Humanities

Carla Ruis, Lecturer in Experimental Psychology – Faculty of Social and Behavioural Sciences, sees a clear added value in an open educational repository: ‘*That would save me time, if I could more easily adopt my colleagues’ lectures, without having to lobby for material. And would the repository be accessible to students too? If so, I’d structure my lecture differently: go home and have a look on your laptop, then during the lecture I’d go into the material in greater depth.*

On online impact and reputations

The widening range of publication forms has direct consequences for the way in which the quality and impact of research results are measured and assessed. In the past, a traditional publication – an article or a book – could be included in an academic CV. These types of publication have been replaced by a multi-faceted output. Traditional ways of measuring impact are losing ground. Currently the publisher and journal title are a guarantee of quality. In an open world quality will increasingly be measured at the level of the publication itself. In the years ahead, the traditional H-index and impact factor will stand alongside a field of alternative metrics (at an article level) that are increasing in complexity.

> *Researchers must know and understand this field to be able to control the influences on their reputations.*

The importance attached to knowledge utilization will have an impact on the online representation of research. And vice versa; research funders will continue to require researchers to make clear what societal or commercial applications academic research will deliver or has delivered. Just as important will be stimulating public engagement. Researchers look for ways to engage the public in their projects and results or collaborate with public institutions.

> *Researchers therefore have an increasing need for support in stimulating and clarifying the societal impact of their work.*

‘*Scientific publications are naturally aimed at an academic audience, so that’s how they’re written. I think that in the future, we’ll have to diversify how we create our publications: an executive summary, a press release or something in that vein, as well as blogs and web-related things.*’ – Frank van Rijnsoever, Researcher in Innovation Studies – Faculty of Geosciences

On the university

The fact that so much scholarly communication will occur online will have an effect on the provision of scientific information and on how researchers and lecturers work. But also on the identity of the university, and on how the university functions as a community. If academia is increasingly organised online, beyond the walls of institutions, the university will cease to be the defining sphere; research and teaching will increasingly occur in knowledge hubs.¹¹

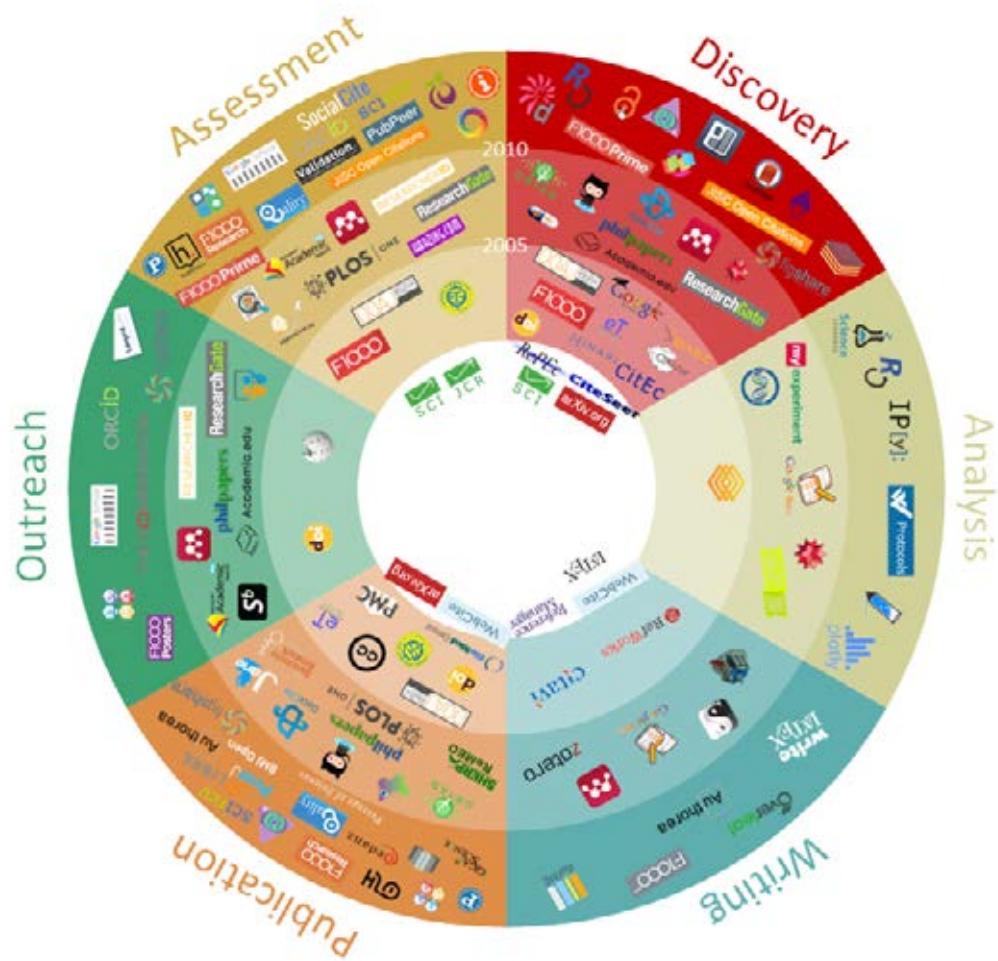
> It is precisely in this fragmented landscape that researchers need consistent and flexible support; university-wide solutions can help here.

Scholarly communication in cycles

The Policy Plan 2015–2017 envisaged a cycle of scholarly communication divided into three stages: *Research – Create – Share* (see Fig. 1). To elaborate on the consequences of the above scenario of future research practice, this report uses an expanded cycle. In particular, the *Share* stage requires a more detailed discussion. In the Policy Plan, the *Share* stage referred to the sharing of knowledge through publishing, delivering teaching and working on the preservation and visibility of publications. In the changing world of academic publishing, this phase in particular requires a different set of skills from academics. This report therefore splits the *Share* stage into three components: *Share/Publish*, *Share/Assess* and *Share/Connect*. In this model, it's no longer solely about the sharing of knowledge, it's also more explicitly about the societal function of academic results, the visibility and impact of research in an online, open field, and how to evaluate that.

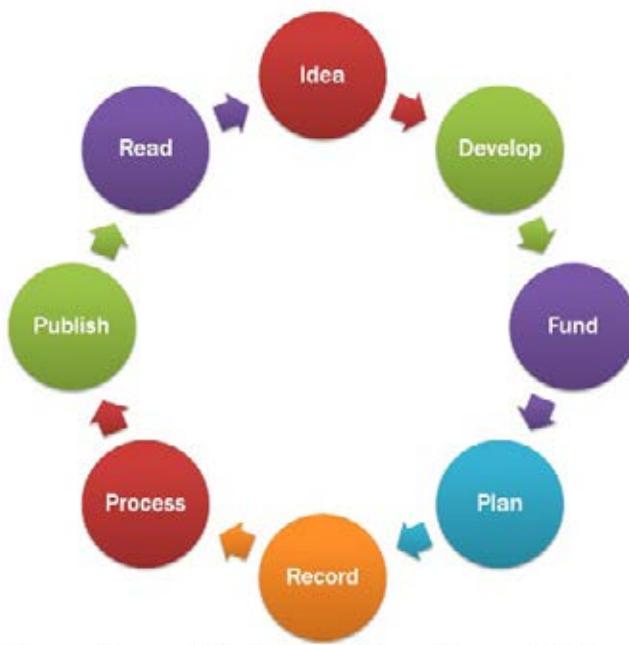
This categorisation draws strongly on the cycle developed by Jeroen Bosman and Bianca Kramer for *101 Innovations in Scholarly Communication*, a University Library project to identify the platforms and tools used by researchers in the research cycle.¹² The second half of their cycle consists of: *Publication*, *Outreach* and *Assessment* (Fig. 2).

Fig. 2: 101 Innovations in Scholarly Communication



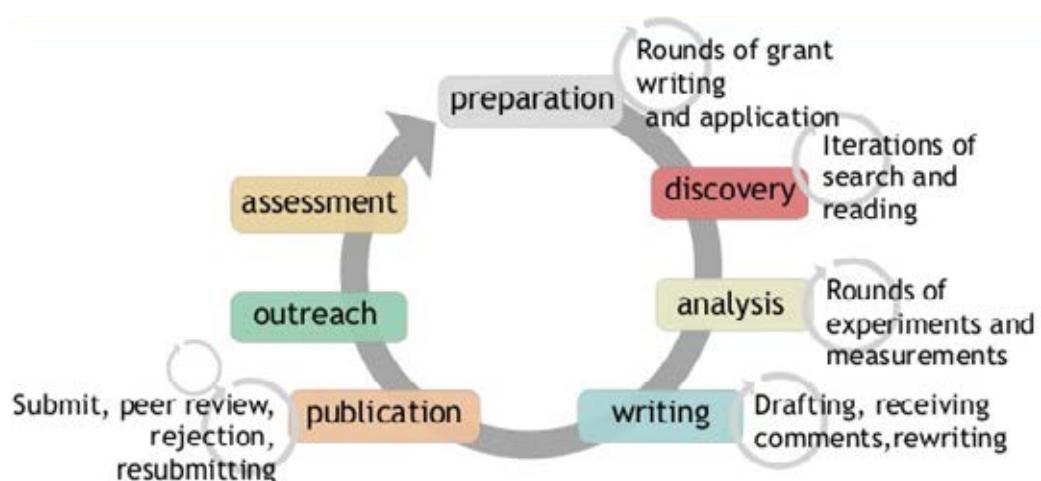
Cameron Neylon, Professor of Research Communications at Curtin University, presents a large quantity of visualisations of research cycles.¹³ These show that the *Research* stage in particular can be divided up in a multitude of different ways. Under *Research*, the Utrecht University Library Policy Plan lists a range of activities that we might associate with starting a research project: compiling literature, meet peers and developing ideas. The cycles collected by Neylon also include these tasks: developing ideas, looking for partners, as well as funding at the start of projects. We have adopted the search for funding (*Research/Fund*) from one of the cycles developed by Neylon (Fig. 3), as we expect the writing of research funding applications to become more laborious and complex. *Research/Discover* has been added as a separate category. After all, providing support in the search for and finding of scientific information is a quintessential library task. A report on the future of the library should obviously include this aspect. The cycle used in this report is: *Research/Fund, Research/Discover – Create – Share/Publish, Share/Assess, Share/Connect*.

Fig. 3: Life cycle by Cameron Neylon



All things considered, no single cycle can adequately represent the complexity of the research process. The use of a cycle suggests a sequentiality that does not do justice to the dynamics of a researcher's daily practice. The cycle shown below (Fig. 4) tries to illustrate those dynamics. In that cycle, the Create stage is divided into activities such as analysing and writing. In this report, we intend 'Create' to include activities aimed at developing scientific information, whether that means data sets, articles or conference posters. This report defines 'scientific information' very broadly: it means research results in every conceivable, shareable form.

Fig. 4: 'Research workflows: iterations and new task sequences' by Jeroen Bosman and Bianca Kramer¹⁴



From ‘closed’ to ‘open’ information services

The scenario of the increasing openness of academia outlined above is a scenario that to a greater or lesser extent will become reality over the next few years. It is precisely because academia will find itself on a scale between closedness and openness in the years to come that academic practice will be extra complex in the short term. Traditional uses and technical innovations, temporary and permanent solutions, commercial and institutional tools will exist alongside each other.

We will also see significant disparities between disciplines along the road towards an open model. The fact is that publication cultures vary enormously and open solutions will therefore not be uniformly satisfactory. In a vision paper such as this report, these differences have to be excluded for the sake of readability. In a broad university like Utrecht University, library services will always have to be aimed at a variety of users with different needs.

Researchers and lecturers move with these developments, initiate and make choices. This requires new expertise and skills when conducting academic research. What do they need on the way to 2030 in those various stages of the cycle of scholarly communication? And what can the University Library do for researchers and lecturers working in this complex, open and internationally-oriented academic world?

This report concentrates primarily on how academic information ‘behaves’ in this changing context. The library aspires to develop its services wherever its expertise can add the most value: in the area of scientific information services and knowledge sharing.

The stages of the research cycle are discussed below against the background of the future scenario outlined above. For each stage, we connect developments in academic practice with new areas of concern for and the possible needs of academics. In doing so, we identify in each case what the University Library can contribute.



The researcher:

- searches information



The library supports:

- information literacy
- optimisation of research tools
- access to relevant sources

Research

> Discover

Not so long ago, researchers and lecturers would automatically start their work at the library, to access scientific literature. There, of course, they would receive help in searching for and getting their hands on publications. For most disciplines, the likelihood that they will still do so in 2030 is negligible.¹⁵ In an open access world, in theory they can refer to all recent scientific information worldwide.

> The increasing digitisation and openness of academic information does not mean that the University Library will stop offering access to its collections. We will continue to provide content that is not available openly for as long as it is necessary. The library has a repository function for millions of volumes. It is also where researchers can find physical collections of books and periodicals, old books, maps and manuscripts.

'This report is solely about scientific information, but there are many forms of content that actually aren't preserved anywhere, because no one considers it to be their responsibility. If you look at the humanities, you'll see that something is missing from this report, namely anything to do with primary source material and any consideration of the question: 'Who does it belong to?' – Geert Buelens, Professor of Modern Dutch Literature – Faculty of Humanities

Researchers and students search for information worldwide and online. But simply because scientific information is online and freely accessible, finding the right information has not become any easier. Precisely because of the fact that research will be published in many different forms and throughout the entire research process, it will be more complicated to keep up with developments within a subject area. You have to know where to start searching and how to filter and assess what you find.

> *The library can therefore support researchers, lecturers and students in the area of information literacy, including search and selection strategies. One consequence of changing search behaviour is that the library no longer has to provide a local catalogue. We assume that in the future, market operators such as Google will provide services to support information searches. The library will still support search services, for example by investing in enhancing metadata, but only in the context of international partnerships between libraries. For example, we are currently collaborating with libraries worldwide to optimise the WorldCat catalogue.*

'I increasingly struggle to keep it relevant. I keep expanding my search terms instead of narrowing them. I end up with literature sets I can't do anything with and which are too vast to actually read. – Raymond Schiffelers, Professor of Nanomedicine – University Medical Center Utrecht

'And what must that mean for our students ... they have had far too little training in how to deal with this enormous quantity of information. When I think about the library of 2030, and actually even the library of 2018, I think: give me library staff that can train our students in these skills.' – Geert Buelens, Professor of Modern Dutch Literature – Faculty of Humanities

The library ensures continuity of access to scientific information:

- By providing support to various target groups in their searching and selection strategies
- By collaborating on optimising search services at an international level
- With a physical collection, old books, maps and manuscripts



The researcher:

- applies for funding



The library supports:

- the information management strategy
- publishing budget calculations

Research

> Fund

At present, funders demand open access publications. Researchers need to have an idea, for example, of the open access options for conference proceedings or the green policies of the publishers of subscription journals. In addition, we've been seeing data management plans for research data for several years now. When they apply for research funding, researchers have to anticipate the output they expect to produce during the research and the tools they want to use.

Publications may be funded from a range of sources and by many different financial backers. Publishing services are sometimes obtained through institutional memberships (see *Share/Publish*) – if so, there's no reason to include those costs in the budget for a project application. However, in other cases a cost estimate is necessary: if services outside of institutional arrangements are to be used, such as commercial services. Or if payment is required for a data set or publication, such as the Article Processing Charge that some open access publishers require for publishing articles.

For researchers, these are all complex components of a grant application. They take up a lot of time, require researchers to have a comprehensive idea in advance of the course the research will take, and necessitate coordination with collaboration partners around who can pay what. The future scenario outlines a greater variation in forms of publication. Accordingly, we expect that funders will want to see this greater variation accounted for in research funding applications. Information management will thus be more complicated than ever.

*> The library can take this work out of researchers' hands. For each subject area, the library knows the services that publishers and other parties provide (see *Share/Publish*) and what the quality of those services is. The library therefore works closely with the Research Support Offices to support those components of research funding applications that relate to information management, and to draft budgets for applications that include the costs of publishing and infrastructure use.*

'The ideal scenario for financial backers is an electronic lab notebook that can be accessed by everyone and is easy to search. But that only works to a certain extent. Companies for example often require their own little corner with special authorisation. And particularly if data has a commercial value, that's usually the end of openness until a patent has been obtained. Then you're talking a couple of years.' – Raymond Schiffelers, Professor of Nanomedicine – University Medical Center Utrecht

'How can we provide support throughout the entire research cycle? One possible outcome is a one-stop shop for researchers. Somewhere people can go for advice, assistance and tools. Then we need to make sure we divide up the tasks properly.' – Andreja Zulim de Swarte, Research Support Officer – University Medical Center Utrecht

The library works with the Research Support Offices to support the following components of research funding applications:

- Budgeting of publication costs
- Information management strategies

CREATE

The researcher:

- generates scientific information



The library supports:

- information management



Create

We assume that particularly in international partnerships, new ways of working online will be found: to discuss, to exchange data, to co-author papers and articles and to respond to collaboration partners and other peers. And where faculties currently have a Blackboard licence, soon more platforms and tools will be used alongside each other to support studying in a digital environment. Then research output or lecture material can be shared and made accessible more or less openly, even while it is still being created. Examples of research output include research proposals, peer review reports, protocols, poster presentations, notebooks, data sets, code, scripts – and perhaps in the long term forms of scholarly communication that don't even exist yet. This means the *Create* and *Share* phases in the research cycle will become more complex, because they will overlap. Publishing will cease to be something that you only do if your research is far enough along, and the outcomes are presentable.

The library supports information management accessible information is:

- findable**
- reusable**
- interoperable**
- visible**
- assessable**
- preservable**

Researchers will have to be able to work in this online and often open landscape. For instance, they require knowledge of intellectual property. That includes copyright, as far as it affects sharing and preserving, or copyright in relation to research data, not to mention database rights, privacy legislation and the as-yet-unexplored but fast-developing area of data and text mining: particularly in open environments it is important to be alert to possible restrictions on reuse and accessibility. In addition, information in an online environment must be organised differently to ensure optimal use throughout the communication cycle. Use and reuse, distribution, preservation and assessment must all be possible. Examples include machine-readable texts, adding metadata, clarifying authors' names, links and identifiers.

Researchers will therefore have to use a wider range of strategies than before to deal with their expected output throughout the course of the research project. Research funders will increasingly want to see plans in advance for how the information in the project will be managed (see *Research/Fund*).

Launching research projects will therefore be more intensive. This will demand a lot from researchers at an individual level, but large international projects will be far more complex. It would be useful for research projects to have an information manager, someone to make sure information complies with requirements imposed by funders, technology or optimal accessibility.

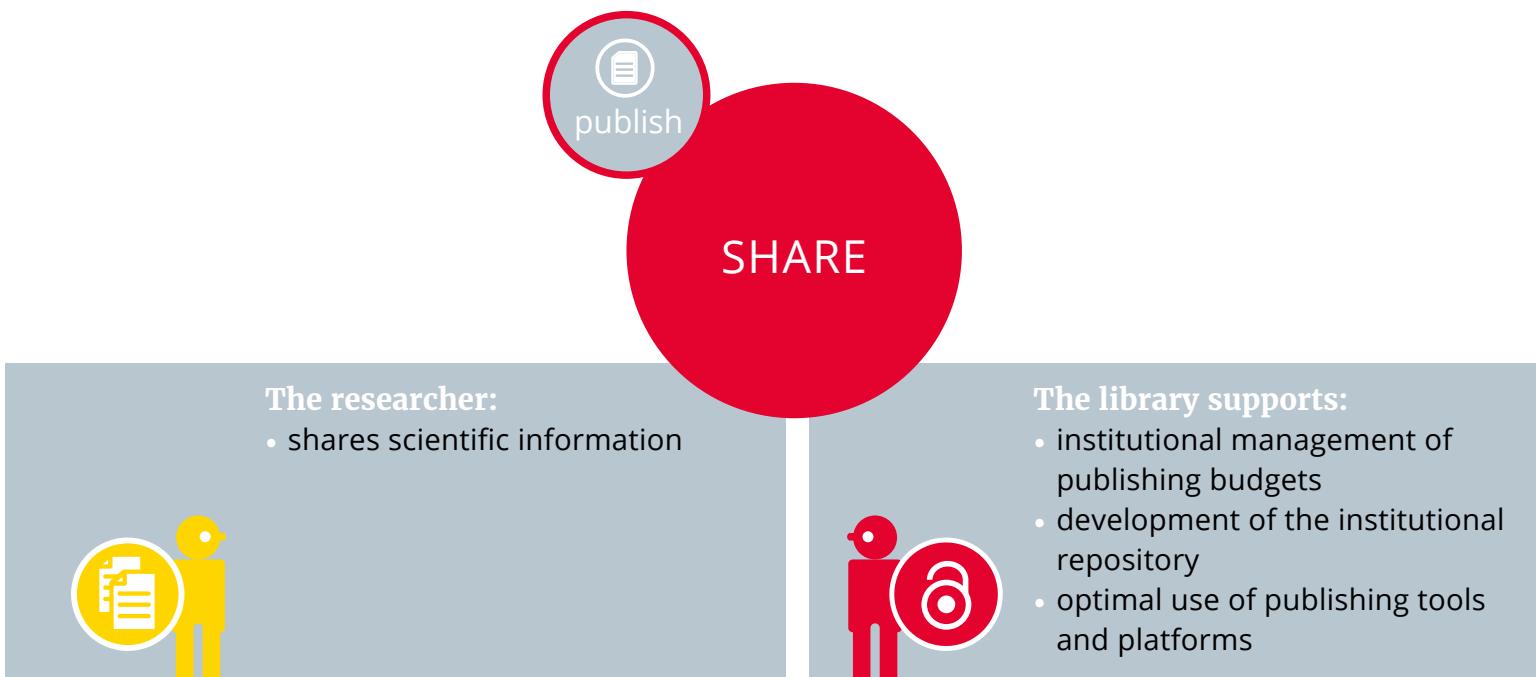
> In the information management area, the library can play a role that is not too far removed from its traditional expertise. Traditionally, libraries seek to guarantee optimal access to information, for instance by working on the standardisation of metadata, ensuring the interoperability of data and systems, and by providing knowledge about intellectual property and copyright. In 2030, the library will not be optimising access of acquired or licensed information. Instead, it will stimulate the accessibility of information produced by scientific research, teaching and strategic projects at Utrecht University. To do so, the library will work with the relevant parties within Utrecht University, such as Information and Technology Services, Research Support Offices and Legal Affairs.

'I think it's tremendously valuable to have someone in the project to manage our data platform, and pay attention to searching, accessibility, reporting and generating an impact.' – Raymond Schiffelers, Professor of Nanomedicine – University Medical Center Utrecht

'What you claim in this report is obvious. The map is being redrawn in terms of where the library can have a role, and there are also other players in the field that you have to relate to. So if you look at the current library and the library ten years from now: what will you stop doing?' – John Vervaele, Professor of Economics and European Criminal Law – Faculty of Law, Economics and Governance

Library information specialists help researchers and lecturers organise scientific information online in such a way that the information:

- Is funder compliant
- Enables collaboration and knowledge sharing
- Can be analysed and re-used
- Doesn't breach copyright
- Can be shared at various stages and in various forms
- Can be preserved
- Is visible
- Is assessable



Share

> Publish

Due to the impact of digitisation and open access, academic publishing is changing. Currently, researchers publish with certain publishers or in well-known journals as a matter of course; that practice will disappear. Publishers will adjust their services and revenue models. They will have to deal with new competitors, such as tech companies who will take over the roles of traditional players. These various parties will supply technical and other services throughout the cycle. This will include infrastructure for collaborating, sharing, editing, metrics, reference managers and researcher profiling systems. Universities, research groups and researchers will use these services, often for payment. As open access becomes more ubiquitous and universities set aside less of their budgets for subscriptions, publishing money can be redirected to be spent on such services and platforms.

> We expect that the University Library will continue to play a pivotal role in this regard. After all, libraries have been maintaining relationships with publishers for centuries: they subscribe to journals, purchase books, know publishers' portfolio's and understand how academic publishing will develop. In the future too, the library will know which platforms are relevant for subject areas and how the quality of various services measures up. We will advise Utrecht University and its faculties about institutional participation in publishing services, maintain contacts with relevant parties on behalf of Utrecht University, and provide central budget management.

'Open does not mean "for free" ... funding will simply be shifted. One will have to make that extremely transparent. It will have consequences for everyone involved.' – John Vervaele, Professor of Economics and European Criminal Law – Faculty of Law, Economics and Governance

'There's a new initiative in the world of linguistics: LingOA. I have no idea what the financial arrangements for it will be in the future, but if in the ideal scenario libraries spend less money on big deals, will that money be available for those sorts of initiatives? Can you take the large publishing houses out of play but not make authors pay the Article Processing Charges? Supporting these kinds of platforms is a great way to do that.' – Koen Sebregts, Researcher in English Linguistics – Faculty of Humanities

For a long time, functions and responsibilities in the information chain were divided rather clearly: for example, while the publisher took care of the distribution and marketing of a title lay with, the university library ensured accessibility and preservation. Online publishing and openness mean the field is broader, more confused and continually evolving. Researchers and lecturers are naturally moving with the new dynamic. Because of the speed with which the field is developing, it is important to be informed and to make strategic decisions about where you want to share your research results and other information. Researchers need to be constantly alert to the purpose and functions of the platforms and tools they use – not to mention knowing what a service or tool actually can and may do with the uploaded information. In addition, the question remains of how stable and sustainable new platforms and services will be.¹⁶ Long-term preservation and continuous availability of scientific information are particularly vulnerable.

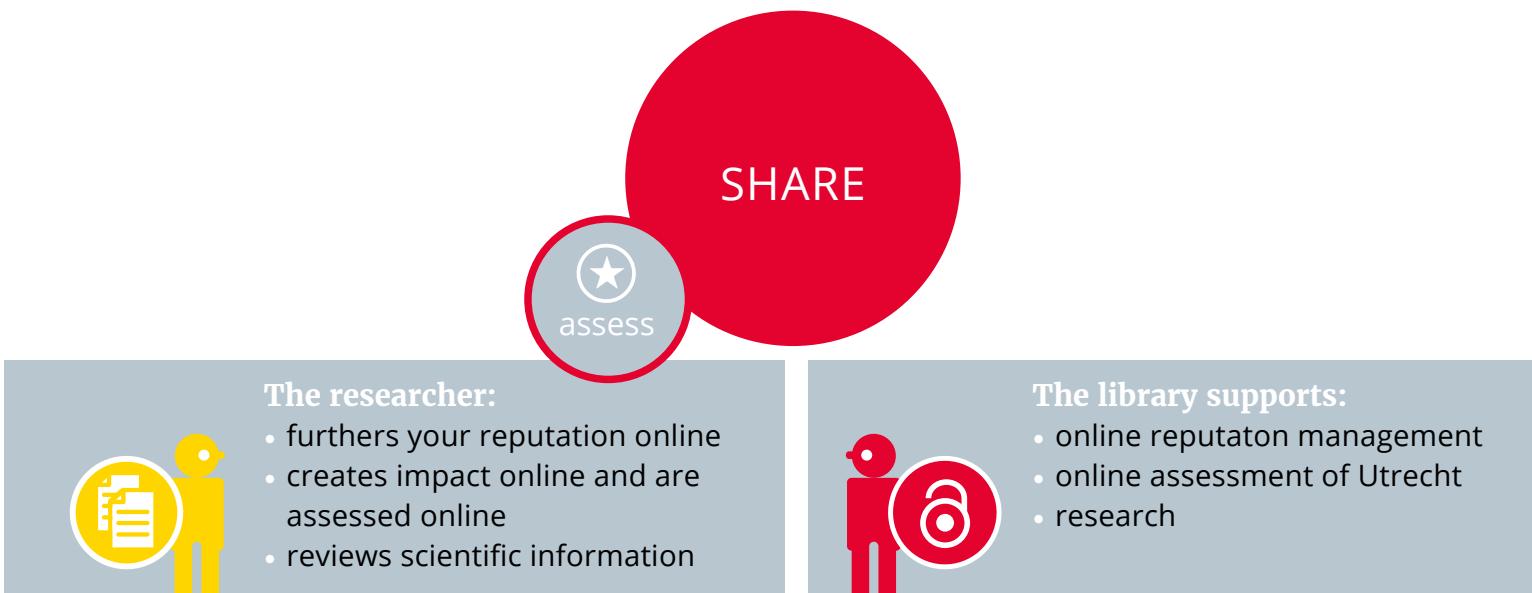
> The University Library secures the long-term accessibility of the academic output of Utrecht University researchers and lecturers. It does so in a variety of ways. The Utrecht Repository acts as an online 'bookshelf' for published information, but unpublished research results are also made available, such as inaugural lectures and working papers. In the future, the library will expand this role. We will develop the repository to provide that long-term preservation for results that Utrecht University researchers and lecturers wish to preserve and make available (see also Share/Connect below). This particularly concerns information where no solution, or no long-term or paying solution, is yet on offer outside of the institution. In this task we will work closely with Information and Technology Services. The library has also formed national and international partnerships to work on long-term solutions for accessibility and preservation of research information (see for example the recent collaboration with DANS for data storage).

'The mood two, three years ago was: Open Access, what a crock. It's so complicated. I'll be retired before it ever gets going. Or: Things are going quite well, aren't they? Of course, progress could be faster, but we're starting to see a bit of movement. We are now so tied up with Kluwer, it's clear we're going to have to make some kind of counter-move.'

– Ton Hol, Head of the Department of Law – Faculty of Law, Economics and Governance

The library ensures the long-term accessibility of scientific information by:

- Following trends in the area of publishing platforms and other services in the cycle
- Developing or helping to develop and test new solutions
- Continuing to develop the Utrecht University Repository
- Managing institutional memberships



Share

> Assess

Reputation is a driving force in academia. The reputations of individual academics and of programmes, and the rankings of research institutes and universities are closely monitored and carefully maintained. The impact of research and teaching is paramount. How reputation and impact are measured is changing radically. Traditional ways of measuring the impact of publications (based on citation analysis) will stand alongside new metrics, which measure not only downloads but usage in social media, news media and policy documents. We expect that the name of the publisher or journal will be less definitive as an indicator of quality. There is a shift towards the level of publication and the author, in which data sets, software code and other research outputs also count as publication.

Peer review, as a means of assessing the quality of academic output, is also subject to change. Online publishing facilitates alternative forms of peer review for publications, such as post-publication peer review and other forms of open peer review. Recognition of the use and quality of reviews (and reviewers) is also supported online through new tools and metrics. Furthermore, the phenomenon of peer review in itself has long been the subject of debate. Whether it's peer review for publications, peer review by committees or institutional peer review for university rankings, the mechanism is both criticised and considered essential for the functioning of academia. It is time-consuming, and open to accusations of bias and inconsistency.

Is traditional peer review compatible with open science, new metrics and other developments in the research world? We expect that in a context of openness, peer review will cease to be that single, formal moment, time-limited and with a fixed objective. Furthermore, it can reasonably be expected that under the influence of increasing openness the entire model of academic assessment, which has already started changing, will undergo major redevelopment

(see Fig. 5). It will become a more complex system, with credits being earned and counted in a greater variety of ways. And due to the critical importance of reputation and impact, transparency, authority and quality will be key to the selection of the online platforms where reviewing will occur.

> The University Library knows which platforms and tools support academic evaluation and peer review, how they are developing, how they collaborate with other platforms and tools and how and when you can use them. We offer insight into the value and operation of citation and publication metrics, as well as into their strategic and responsible use. We also understand metrics at the author level (social media and researcher profiles).

The library is developing services to support researchers in understanding their impact, so that they can harness it for tenure purposes: in CVs, annual evaluations and research funding applications. We also support assessments of the impact of major Utrecht University projects, in conjunction with the Office of Academic Affairs and the Research Support Offices.

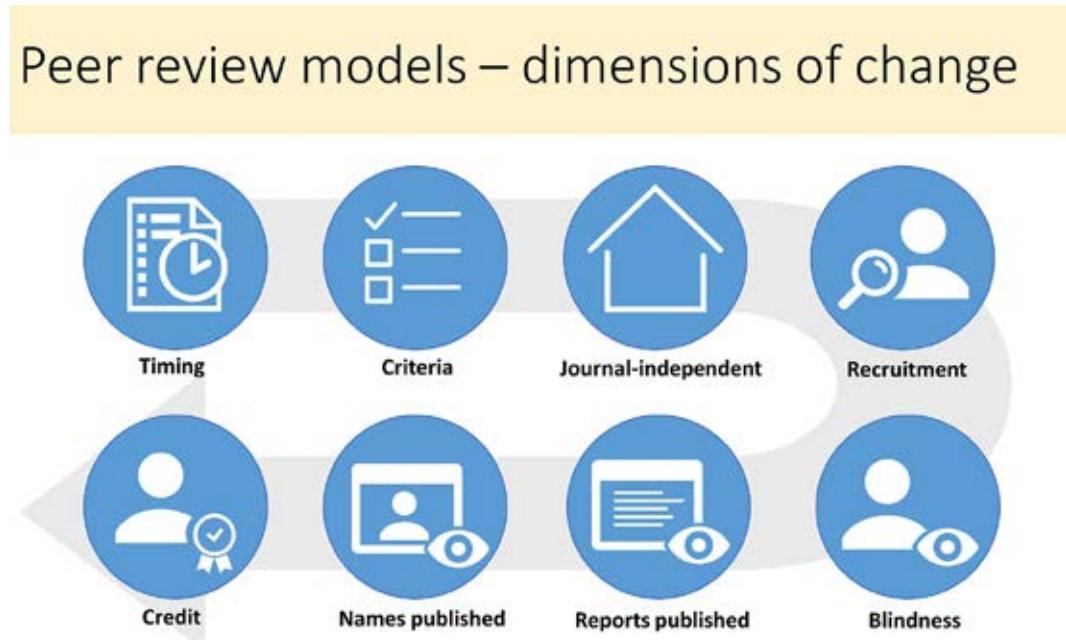
'In the assessment for my Senior Research Qualification, people were impressed by the number of peer reviews I write, but in fact peer reviewing is not part of the assessment. I think in the future we will increasingly move towards post-publication peer reviews, with likes, dislikes and comments. Perhaps publications will be under development somewhat longer while authors revise them a couple of times.'

– Frank van Rijnsoever, Researcher in Innovation Studies – Faculty of Geosciences

'My blogs are my most impactful publications, they spread through the community so easily.' – Pim Huijnen, Researcher in Digital Humanities – Faculty of Humanities

'In my grant application, I had to specify my impact as a researcher. Google does have this kind of service, but that data wasn't right. So how can I get the right data? How do I know how often my reports are being read?' – Miroslava Scholten, Researcher in European Law – Faculty of Law, Economics and Governance

Fig. 5: 'Aspects of peer review that are subject to change' by Jeroen Bosman and Bianca Kramer



At the institutional level, other assessment mechanisms are also at play. Currently, international university rankings are paramount, such as the CWTS Leiden Ranking, the Shanghai Ranking and the Times Higher Education World Universities Ranking. For universities, it is important to understand the methodology behind the major ranking systems.

In terms of assessment, the societal impact of an institution or research is an increasingly critical factor. The latest Standard Evaluation Protocol from the VSNU 2015–2021, for example, which describes the conditions that must be met by research assessment in the Netherlands, uses three criteria for assessment: *research quality, relevance to society and viability*.¹⁷ The way in which public impact is measured is undergoing significant development. For example, we can foresee a shift from quantitative to more narrative metrics (see also *Share/Connect*).

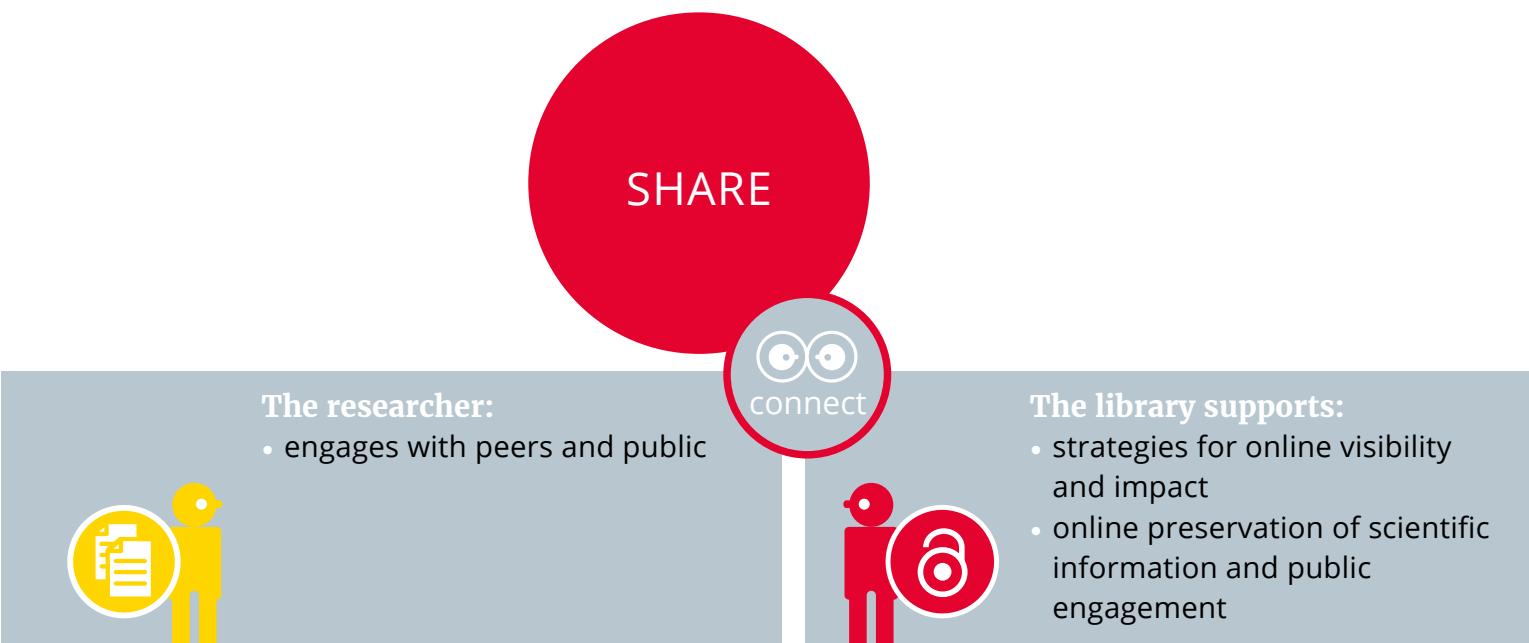
> People often look to libraries for an explanation of the methods used to produce university rankings. An understanding of bibliometrics and other old and new metrics is relevant, and the library can also explain how the various types of metrics work. Worldwide, we're also seeing libraries supporting external institutional assessments with bibliometric reports based on institutional research information systems (such as the CRIS Pure at Utrecht University). The library can play a key role in this regard. We understand how information works when it is categorised. We are good at analysing which relationships can be established and which queries can reasonably posed to an information system. The library sees itself playing an advisory role in the field of assessment.

'The other day, I happened to be looking for impact factors from journals to present alongside my publications for a grant application. Turns out there are five different kinds! And just this week I got an email from Elsevier about the launch of another two new impact factors. I couldn't bring myself to read it in detail.' – Mathilde Hagens, researcher in Marine Biogeochemistry – Faculty of Geosciences

'There are no impact rates for societal relevance.' – Jos van Putten, Research Director and Vice–Dean – Faculty of Veterinary Medicine

The library contributes to the reputation and impact of Utrecht University researchers by providing services and advice in the areas of:

- Individual assessment and reputation management
- Assessment of major projects with a Utrecht University component
- Institutional assessment



Share

> Connect

Connect is about the visibility of academia and disseminating research to peers and the public. Our scenario assumes that the impact of research in the future will largely be measured digitally and that academic reputations will be formed online. It will be increasingly important to think strategically about the way we handle online visibility. Current examples include how researchers profile themselves on Twitter, as well as how many peers can be reached via platforms such as academia.edu or Mendeley. The fact that researchers primarily collaborate online gives them many more possibilities to influence their visibility and reputation. Moreover, those possibilities are constantly changing because technology is in a state of constant renewal. Researchers actually have to constantly act as their own marketers or reputation managers, keeping an eye on results.

One field in which this strategic commitment is increasingly necessary is that of valorisation and societal impact (see for example VSNU's SEP 2015–2021, and see also *Share/Assess*). Whereas academic relevance and quality of research were the usual criteria in the past, social relevance is becoming increasingly important for obtaining research funding. Researchers do not only have to justify how their research will benefit society, they also need to stimulate public visibility of and engagement in their research and provide insight into its impact. Researchers have to devote considerable time to this task.

We still do not know enough about future public engagement: to what extent will crowd funding and the business community determine academic agendas? How do you involve the public in an academic discourse? What tools or criteria will be used to gain insight into the societal relevance of academic research? What will research funders then do with that information? It is reasonable to expect that universities will also develop the services they provide to researchers in the area of public visibility, as the Center for Science Communication and Culture is currently doing.¹⁸

> *The library monitors new and existing platforms and tools that make research visible and measure its impact. The library helps researchers use these tools and platforms.*

'In my most recent appraisal interview, I agreed to develop my profile as a kind of public intellectual. I then tried to register that output, but it is very difficult to do so.' – Dan Hassler-Forest, Researcher in Media and Performance Studies, Faculty of Humanities

'We see our journal as a means to bridge the gap between our academic activities and a wider audience of academically educated people with an interest in history. You have to build a community around your journal. You have to organise public events from time to time, where readers, writers and the editorial team can meet each other. And you have to look for opportunities to collaborate.' – Jacco Pekelder, Chief Editor of Tijdschrift voor Geschiedenis (Journal of History), Faculty of Humanities

'Outreach is more about my stakeholders than my peers: policymakers, the faculty, SURF-Sara, the EU. And it's about the general public. We recently had a visit from a primary school. We took photos and tweeted about it. Those children will be the next generation of scientists.'
 – Alexandre Bonvin, Professor of Computational Biology –
 Faculty of Sciences

It is reasonable to expect that academic publishers, institutes and other parties will develop platforms and tools for storing, disseminating and evaluating academic information. It is logical that 'public communications' (such as interviews, image material, blog posts and lectures) will form part of this process, as an important new category. Ideally, connections will develop between new and existing platforms for academic content and between new and existing infrastructure for sharing, preserving and measuring output for a wider audience.

> *The University Library supports the Utrecht University Repository with knowledge of long-term preservation, findability and copyright issues. It is to be expected that the library will expand this expertise, particularly in relation to the online interface between academia and the public. The basic principle is that the library's primary focus will always be on the long-term accessibility of Utrecht University's scientific information. As long as other providers (commercial or otherwise) are not already supplying a similar service, it is possible in the short term that the University Library's services could include turning the institutional repository into a central location*

where the university's 'public communications' such as blogs, newspaper articles and YouTube videos can be stored. Preferably, these would be linked to the researchers' profiles and relevant academic publications. To do this, the library is looking to work with the Center for Science Communication and Culture and the faculty communications departments.

Connect is also about Utrecht University as a community, about collaboration and meeting people. The library can play a connecting role here. The borders of academia are becoming increasingly gradual. Teaching and research are increasingly taking place through international, online partnerships, knowledge hubs and communities. Students, lecturers and researchers come to the library to meet each other, to work together and to study.¹⁹

> The library building plays a connecting role on the campuses. In the city centre and at De Uithof, the University Library is a building that fuels the imagination, where knowledge is shared and the walls between disciplines are broken down. The library innovates and invests in user-friendliness and in the perception of the library as an inspiring knowledge environment – whether that is about the symbolic value of the building or more practical matters. The library is as much the heart of the university as a centre of knowledge.

'Take connectivity seriously as a concept; pursue it ambitiously and with your eye on the goal. It has to be about the connection between students, researchers and library specialists; matching the physical with the expertise. For example, separate rooms could be provided for group work, and there could be a help desk staffed by people who can answer questions not only about authors' contracts and publication funding but also search strategies: a place where you could connect all the components of the cycle.' – Katell Lavéant, Researcher Late Mediaeval and Early Modern Literature – Faculty of Humanities

> Training and services support knowledge sharing and open research and education. The University Library is looking to collaborate with different Utrecht University units and programmes, such as the Academic Skills Centre and Educate-IT. The services of the various units will be integrated as much as possible and the expertise of the University Library will always have a logical place in that process.

The library contributes to the visibility and impact of Utrecht University researchers by:

- Facilitating the use of knowledge and figures about the impact of scientific information on a range of platforms
- Preserving output for a wider audience over the long term where necessary

The library connects the Utrecht University community:

- By supporting collaboration and knowledge sharing
- By encouraging the integration of services between Utrecht University units

'I was actually very pleased with the plans in this report. I think the long-term approach is elegant. I am struggling with three things in particular. For storage of large data files, everything is well arranged in the Netherlands. For very small files too: they can simply be supplemented to articles. But everything in between is a problem. At the moment we literally carry hard drives all over the world, with hundreds of gigabytes of the hard data files behind our computer models. I want to be able to preserve those data sets from completed projects over the long term, preferably in conjunction with the associated publications. And by the way, we also have a video clip aimed at the general public! At the moment, there is no structure to preserve everything and present it coherently. It's a case of 'project grant gone, structure gone'. That's really annoying! If the library could create such a structure, I'd be very enthusiastic about that. It would be best to organise something like that at an institutional level to ensure longevity. The advantage is that researchers wouldn't be giving away their intellectual property. That's why services in the cloud are such a risky business. I think the picture outlined by the report is complete, because it includes outreach. It would be beneficial to have a single party who can connect all kind of outputs for a single project.' – Maarten Kleinhans, Professor of Physical Geography – Faculty of Geosciences

Endnotes

- 1 [Utrecht University Library Policy Plan 2015–2017](https://www.uu.nl/sites/default/files/beleidsplan_ub_utrecht_2015-2017_engels.pdf), see: https://www.uu.nl/sites/default/files/beleidsplan_ub_utrecht_2015-2017_engels.pdf
- 2 Utrecht University Library Policy Plan 2015–2017, p. 3.
- 3 Utrecht University Library Policy Plan 2015–2017, p. 12.
- 4 Utrecht University Library Policy Plan 2015–2017, p. 12.
- 5 See for example: Ernst-Jan Hamel, ‘De universiteitsbibliotheek is een studiehuis geworden’ [The university library has become a study hall], interview with Anja Smit in DUB, <http://www.dub.uu.nl/artikel/achtergrond/universiteitsbibliotheek-studiehuis-geworden.html> [last accessed: 26/11/2015]; and Ingrid Robeyns, ‘Wij hebben een prachtbibliotheek’ [We have a glorious library], in DUB, <http://www.dub.uu.nl/artikel/column/wij-hebben-prachtbibliotheek.html> [last accessed: 26/11/2015].
- 6 For the Amsterdam Call for Action on Open Science during the Dutch EU Presidency: <http://www.eu2016.nl/documenten/rapporten/2016/04/04/amsterdam-call-for-action-on-open-science>; for support from the VSNU for this plan, see: http://www.vsnu.nl/nl_NL/nieuwsbericht/nieuwsbericht/248-vsnu-verheugd-over-europees-actieplan-open-science.html; for the EU policy, see: <http://ec.europa.eu/research/openscience/index.cfm>; for the Utrecht University policy, see the Strategic Plan 2016–2020, p. 21: <https://www.uu.nl/en/organisation/strategic-plan-2016-2020> [last accessed: 23/05/2017].
- 7 Open to All? Case studies of openness in research. A joint RIN/NESTA report, September 2010. http://www.rin.ac.uk/system/files/attachments/NESTA-RIN_Open_Science_Vo1_0.pdf [Last accessed: 08/12/2015].
- 8 See for instance: <http://blog.oup.com/2015/11/future-scholarly-publishing/> [Last accessed: 25/11/2015].
- 9 See the services of Faculty of 1000 and ScienceOpen, whose platforms support findability, writing, publishing and reviewing.
- 10 Open to All? Case studies of openness in research. A joint RIN/NESTA report, September 2010, pp. 42–43. Available via: http://www.rin.ac.uk/system/files/attachments/NESTA-RIN_Open_Science_Vo1_0.pdf [Last accessed: 08/12/2015].
- 11 Bert van der Zwaan, http://dub-e-magazine.magzmaker.com/ezine01/van_der_zwaan_kijkt_in_de_toekomst [Last accessed: 22/03/2016]. See also: http://www.uu.nl/cmfiles/intranet/Quid_Durat_Presentatie_Bert_Van_Der_Zwaan_20150827.pdf, p. 28 [Last accessed: 09/06/2016].
- 12 <https://101innovations.wordpress.com/> [Last accessed: 08/12/2015].
- 13 <http://www.slideshare.net/CameronNeylon/from-research-life-cycle-to-networks-the-role-of-the-library> [Last accessed: 26/11/2015].
- 14 See Slide 6, <http://www.slideshare.net/bmkramer/the-good-the-efficient-and-the-open-oai9>.

- 15 For a perspective on developments in the acquisitions areas, see: Coen Wilders, De (toekomstige) vorm, inhoud en functie van de open opstelling. Onderzoek naar de samenstelling en het gebruik van de open opstelling in de UB Utrecht, mei 2016 (The future form, content and function of the open stacks. Research into the composition and use of the open stacks at Utrecht University Library, May 2016). This report emphasises the exceptional position of the Humanities on the road to openness. Full open access to books and non-academic publications such as novels, which academics in the Faculty of Humanities use more than other disciplines, is not likely in the foreseeable future.
- 16 See for example these blog posts about the various functions and target groups of a network site such as Academia.edu compared with other platforms: <http://osc.universityofcalifornia.edu/2015/12/a-social-networking-site-is-not-an-open-access-repository/>; <http://blogs.lse.ac.uk/impactoftosocialsciences/2016/02/01/should-you-deleteacademiaedu/>.
- 17 <https://www.vsnu.nl/files/documenten/Domeinen/Onderzoek/SEP2015-2021.pdf>, p. 7 [Last accessed 28/5/2018].
- 18 This infographic from a British study into public engagement illustrates the growing awareness of its importance: http://www.wellcome.ac.uk/stellent/groups/corporatesite/@msh_grants/documents/web_document/wtp060035.pdf [Last accessed: 11/12/2015].
- 19 For information on the use of the open stacks in the University Library, see: Wilders, May 2016.

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University library