



Why your company needs a reference management tool

And four factors to consider when selecting one

Does the following scenario sound familiar to you? Your company needs to keep on top of the latest research findings to stay competitive. Team members will find and locate PDF articles and save them on their own computers. In another workgroup, the same paper might be found, purchased, and analyzed as well. One year later, the paper might be needed for another project, but since no one could find it on the network, it's then located, purchased, and analyzed again.

All of this extra work means wasted time and money for your company. What's more, this problem could have been avoided if the PDF and its notes had simply been saved in a place where other team members could find them.

Reference management software can help with this challenge, since it provides a central place for saving external literature and making it easy to find again. Originally developed for the university environment, reference management programs have been increasingly adopted by knowledge-oriented companies over the past decade.

Three challenges – finding, saving, and protecting information

Reference management software helps with three main challenges that knowledge-oriented companies face:

- Being able to pick out useful sources and ideas from the multitude of information that is published and then later find it again.
- Working together in a team to create a knowledge repository, thus making each team member's information and insights available to everyone else in the group.
- Protecting this hard-won knowledge from loss or access by third parties.

Below we'll give you an overview of how the most popular programs work. We'll then discuss what you should consider when selecting a program to use within your company.



“ With Citavi we can make each employee's knowledge permanently available to the entire company. ”

Nicolai Speker, Preliminary Development,
Laser Processing Technology
TRUMPF Machine Tools and Laser Technology

Three levels of information management

All reference management programs have one thing in common: they provide a place to collect metadata for books, articles, webpages, and other sources which can then be used to cite these sources in reports, articles, or books that you write.

This use of metadata leads to greater efficiency when writing texts, since citations and reference lists no longer need to be created manually. Instead, they will automatically be correctly formatted and output with all necessary information that the citation style you select requires.



Metadata management

Selecting references to be added to the database can help a company filter out relevant research. This work is worthwhile, since reference management programs contain search options to easily retrieve sources later on. However, at this level, the value of the program for an organization is still relatively limited since only the metadata is used and not the actual source.

Document management

For this reason, most reference management programs now no longer just manage metadata but also full-text documents, which are attached to the corresponding records in the program. This makes a reference management program superior to the traditional way of saving PDF files in a folder structure on a network drive. Locating an article again is much easier than it would be within a simple hierarchical folder structure since the program makes it possible to search its metadata or a term within the full text.



Idea management

However, often what's most important is not the article itself, but the information contained within it in individual paragraphs or sentences. For this reason, many reference management programs make it possible to highlight text passages in a PDF so that you can see the important sections when you quickly scroll through it. If the reference management program doesn't have this capability, an external PDF viewer can be used to create highlights.

One drawback is that these highlighted text passages remain tethered to the PDF file and cannot be grouped with text passages on similar topics from other PDFs. Ideally, it would be possible to view all text passages on the same topic at once, even if they came from different PDF articles. For this to happen, it would have to be possible to manage these items in the same way as references.

The only program in the comparison table below that can do this is Citavi with its knowledge organization workspace. While Zotero can be used with a special add-on to extract text passages from PDFs and save them in a notes field, only Citavi treats each text passage as an individual element that can be tagged, grouped, and categorized. These knowledge items can be displayed in their thematic context along with other knowledge items. However, they never lose their relationship to the reference and PDF, and it's always possible to jump directly to their original context in the PDF.

Considerations when selecting a reference management program

Now that you know how a reference management program works and when it is useful, let's look at some special considerations for choosing a program. Below we'll focus on four factors important for organizations: integration into existing workflows, teamwork possibilities, data security, and support services.



Integration into existing workflows

Each company's knowledge accumulation process varies from industry to industry, from company to company, and from person to person. A reference management program must be flexible enough to integrate into existing workflows. One possibility is through an open add-on interface, which makes it possible to add or customize features for special workflows. Since it is an open source program, Zotero is by its very nature well equipped for this. The only other program that makes it possible to add features with simple macros and more complex add-ons is Citavi. New features essential for your company's knowledge management workflow can be developed and customized as required by the team or industry.



Teamwork options

Although company workflows differ, one thing all companies have in common is that their work often happens in teams. Even if some team members work on individual projects, the results will usually be shared with the group at a certain time. The possibility of working together on a shared literature database or being able to make it available to the entire team is thus a key consideration when selecting a program.

Also, think about features that might help your team work together more efficiently. For example, in-program task management can be helpful if you want to delegate jobs to a colleague. If you have a question about a paper that another team member already worked with, in-pro-gram chat features can make communication quick and painless.

For some companies, it is also important to be able to manage team members' access and editing privileges. Not everyone should be able to access all projects, and not everyone should be able to edit all projects. A reference management tool must allow for differentiated user roles. Both Zotero and Citavi offer the possibility of assigning read-only and editing privileges.

Data security

Closely related to teamwork is where the program stores information, since most reference management tools require databases to be online to use collaboration features. This means storing information on a server outside of the company's internal infrastructure, which can conflict with data security and data protection policies within the organization. When deciding which program to use, the location and provider of the reference management program's server should be taken into consideration, since each country has its own data protection laws.



Despite improvements to cloud technology and cloud security, many companies still prefer a simple data security strategy: onsite, locally stored files. With many reference management programs only offering team features in the cloud, this has led to a dilemma: either save information in the cloud or lose the ability to collaborate.

Only three programs support local teamwork scenarios: Reference Manager, Zotero, and Citavi. Reference Manager once was a popular tool for collaboration, but its development was stopped in 2008 and support ended in 2016. While Zotero allows for saving a Zotero file server locally, this is only possible with a Debian Wheezy server.

Citavi offers two possibilities for local teamwork. The first option is to save a Citavi for Windows project on a local network drive. In this scenario, up to three users can work on a project file at the same time. The second option is to use the edition Citavi for DBServer, which has no limitation on the number of users. With this option, projects are saved on a Microsoft SQL database server in either the full or the free Express version.

Even with Citavi there are still teamwork scenarios that are difficult to realize locally, for example, if the company works with external users such as medical writers or agencies. For these scenarios, the necessary information would have to be made available to the external workers online. As mentioned above, companies concerned about data security should check which country online projects are stored in, which data protection laws apply, and who the server provider is.



Professional support services

As a knowledge-based company, your employees' time is probably one of your most valuable assets. If problems arise with your reference management tool, you want to be able to resolve them as quickly as possible. So, the availability of professional support services should also be a consideration when selecting a reference management program.

Fortunately, all commercial solutions (Citavi, Endnote, etc.) offer such support. Only open-source programs, such as Zotero, do not offer professional support services. Here it's also important to note that customer support for Reference Manager was discontinued in 2016.



“ When we started searching for a new reference manager, it was hard to convince the other companies to make changes specific to our needs because they didn't want to do it. Citavi was not only willing to accommodate our needs but were enthusiastic about it. They continue to support us with that same enthusiasm. ”

Chris Mason, Project and Document Management Specialist
Camargo Pharmaceutical Services, LLC

Bottom line

Reference management programs no longer only manage references. Increasingly, they also support companies in evaluating external literature, extracting and saving important insights from those sources, and making this content available to the entire team. They are quickly becoming an essential tool for knowledge-based companies that need to stay ahead of the curve.

When selecting a reference management program for your company, it's important to consider customizability, teamwork capabilities, support, and data security.

[See the next page for a comparison](#) ✓

Knowledge generation

Creating and finding metadata					
Attaching PDFs					
Highlighting text passages in the program					
Extracting selected text passages				With Zotfile add-on	
Organizing selected text passages					

Data storage

Shared cloud projects/libraries	Microsoft Azure Germany (project data), MS Azure Western Europe (personal data)	EndNote's own server, USA	No server information available, but likely Amazon Web Services, USA	No server information available, but likely Amazon Web Services, USA	
Shared local or network projects	Company's own devices or network				
Shared database server projects	Company's own SQL/MySQL Server			Zotero data server on Debian Wheezy	

Teamwork options

User limit	No user limit in cloud projects and database server projects; up to three concurrent users in local or network projects	Up to 100 users in cloud projects; each user can only make one library available online	Up to 100 users in cloud projects	No user limit in cloud projects	
Separate roles and rights on a project or library basis	In cloud and database server projects			In cloud and database server projects	
Chat features					
Task management and delegation					

Ability to create customizations for special workflows

API available					
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Support services

Professional support with service level agreement					
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* Reference Manager: Development was stopped in 2008, support was discontinued at the end of 2016.

Contact

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