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Coffee Lecture

Software tools to support the Systematic Review process

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How can software tools help for the SR process?

- Systematic Reviews are usually very labour-intensive and time consuming projects
- Specialized software may support you with either single tasks in a Systematic Review – or with the whole process
- may help to streamline processes reviewers need to go through

Tasks in the SR process:

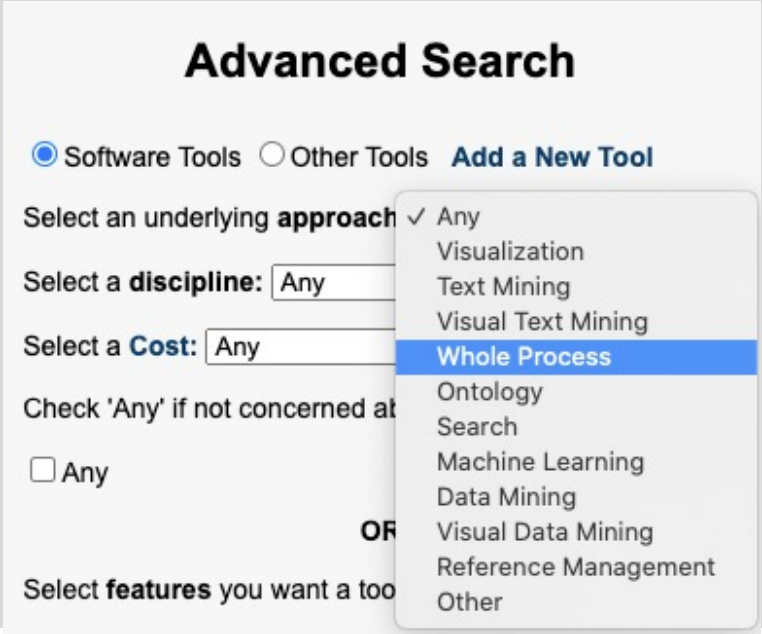
- Collecting and sorting
- Critically evaluate
- Summarize

Stages of a Systematic Review

- Protocol development
- Extensive literature searches
- Study selection
- Data extraction
- Risk of Bias assessment
- Data synthesis
- Report writing

Finding tools to help with Systematic Review processes

For an overview take a look at the **Systematic Review Toolbox** accessed at http://systematicreviewtools.com



Selection of SR tools

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Fee-based tools

- Covidence
- Eppi Reviewer
- DistillerSR

Free tools

- Cadima
- Rayyan

Brief overview

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SR Tools	Covidence	Eppi-Reviewer	DistillerSR	Cadima	Rayyan
Study Selection					
Quality Assessment					
Data Extraction					
Automated Analysis					
Text Analysis					
Meta-Analysis	-> RevMan				
Report Write-Up	-> RevMan				
Document Management					

Covidence

- Covidence (https://www.covidence.org/) was developed by an Australian not-for-profit company specifically to guide reviewers through a prescribed Systematic Review workflow
- In 2015, Cochrane initiated a partnership with Covidence that made it the standard production platform for Cochrane reviews.
- Since then, the product has been developed towards the needs of Cochrane: e.g. focus on ensuring blinding; Risk of Bias assessment is geared towards RCTs (Rob-2 Tool)

Supports:

- ✓ Study Selection
- ✓ Data Extraction
- ✓ Quality Assessment/ Risk of Bias
- ✓ Creation of PRISMA reports
- ✓ Document Management

Covidence

Availability (costs)	Fee-based; free only for Cochrane authors
Web-based	yes
Flexibility	Limited flexibility / customization
References import	Easy: RIS, XML, PubMed, allows bulk PDF imports
Assigning roles to reviewers	Yes, incl. a tie breaker role for conflict management
Blinding reviewers	Yes (mandatory)
Risk-of-Bias Tool	RoB-2 tool integrated, others (custom template) need to be set up
Specialities	Data export files: to Excel / Revman for meta-analysis

Covidence

Pros:

- Streamlined process, takes reviewers through a prescribed workflow
- Intuitive and easy to use, straighforward screening

Cons:

- Covidence lacks flexibility in design
- not designed to support complex review types (diagnostic test accuracy, prognostic and qualitative reviews), for which **EPPI-Reviewer** is recommended by Cochrane
- Customizing quality assessment templates and data extraction forms in Covidence affect data export options (RevMan or Excel) – this is being optimized

Eppi-Reviewer

- EPPI-Reviewer, developed by the EPPI-Centre at University College London, is a web-based tool, recommended for Cochrane authors (https://training.cochrane.org/resource/eppi-reviewer)
- It supports in writing all types of reviews (not only standard SRs, recommended for **meta-analysis, mixed methods reviews**
- Workflows supported by AI
- Designed for review updates as well

- ✓ Study Selection
- ✓ Data Extraction
- ✓ Automated Analysis
- ✓ Text Analysis
- ✓ Meta Analysis
- ✓ Collaboration
- ✓ Document Management

Eppi-Reviewer

Availability	Fee-based, free trial
Web-based	Latest version is a web application
Flexibility	very flexible, customizable
References import	Different formats (RIS etc.), but no bulk PDF import
Assigning roles to reviewers	Yes, coding of different status for team members
Blinding reviewers	Yes, switch between „normal“ and „comparison mode“
Quality Assessment	Various assessment tools (standards, do-it-yourself)
Specialities	Very collaborative, work distribution wizards

Eppi-Reviewer

Pros:

- Software for different review types
- Includes features such as text mining, data clustering, classification and term extraction, utilizing machine learning
- produce interactive ‘maps’ of research activity, evidence gap maps etc.
- Extensive quality assessment and reporting features

Cons:

- For Mac still a beta-version
- No bulk PDF import (upload for each reference by clicking on DOI)
- For institutions license fees are expensive

DistillerSR

- DistillerSR supports the whole SR process, it is produced by Evidencepartners.com https://www.evidencepartners.com/products/distillersr-systematic-review-software
- Workflows are streamlined and automated by machine learning (AI tool „Daisy“)
- Extensive selection of quality assessment tools and templates for data extraction, reports and graphics methods etc.
- Designed for all review types

Supports:

- ✓ Protocol Development
- ✓ Study Selection
- ✓ Quality Assessment
- ✓ Data Extraction
- ✓ Automated Analysis
- ✓ Report Write Up
- ✓ Collaboration
- ✓ Document Management

DistillerSR

Availability	Fee-based
Web-based	yes
Flexibility	Very flexible, customizable
References import	Very easy, even by drag & drop, bulk import of PDFs
Assigning roles to reviewers	Yes, administrator assigns roles to reviewers
Blinding reviewers	Yes, blinding is continous, the administrator acts as tie breaker
Quality Assessment	All standard Risk of Bias-Tools integrated, you may also create your own
Specialities	Datamining, Machine learning tool automates workflows and analyzes study rankings

DistillerSR

Pros:

- Very comfortable “All-inclusive package”
- Supports Protocol development
- Adaptable
- Easy update of reviews

Cons:

- For institutions license fees are expensive

Cadima

- Free web tool (https://www.cadima.info/) designed for systematic and other types of reviews and evidence maps (all research disciplines, not only medical)
- Cadima was designed by researchers at the Julius Kühn-Institut (Federal Research Centre for Cultivated Plants, Quedlinburg, Germany) in cooperation with the Collaboration for Environmental Evidence (CEE).

Supports:

- ✓ Protocol Development
- ✓ Study Selection
- ✓ Data Extraction
- ✓ Quality Assessment
- ✓ Creation of reports
- ✓ Report Write Up
- ✓ Document Management

Cadima

Availability (costs)	Free tool
Web-based	yes
Flexibility	very flexible in all stages, customization of selection criteria and critical appraisal criteria, data extraction sheets
References import	only RIS, bulk PDF upload (500 in one step)
Assigning roles to reviewers	yes, incl. tie breaker for conflict resolution
Blinding reviewers	yes, possible for both Ti/Ab + fulltext screening, can be changed
Risk-of-Bias	RoB-2 tool / critical appraisal criteria must be set up
Specialities	Cadima is designed for SRs in all disciplines

Cadima

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Pros:

- Critical Appraisal Criteria can be set up according to different question formats (PICO and others)
- Selection criteria for studies can be altered
- Graphics/Analysis of study selections
- Detailed documentation of the whole review process

Cons:

- Deduplication based on comparison of Title, Author, Year only
- No sheets for Data synthesis available

Rayyan

- Rayyan (https://www.rayyan.ai/) is a web based, collaborative application to support undertaking systematic reviews. Also includes a mobile app for screening studies on the go.
- Developed at Quatar Computing Research Institute
- Rayyan has no prescribed workflow and is primally designed to aid with the reference screening
- Users are able to initiate and/or participate in an unlimited number of reviews

Supports:

- ✓ Study Selection
- ✓ Collaboration
- ✓ Text Analysis
- ✓ Data Visualization

Rayyan

Availability (costs)	Free tool
Web-based	yes, includes a mobile app for screening studies on the go
Flexibility	customizable
References import	easy, all formats
Assigning roles to reviewers	yes
Blinding reviewers	You can switch from Blinding to un-blinding any time
Specialities	Offers collaboration of unlimited numbers of reviews User interface presented in multiple panels Record prioritization using machine learning Word cloud; 5-star rating system for studies Similarity graphs for data

Rayyan

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Pros:

- Customizable interface
- Keyword highlighting
- Text Analysis
- Calculates reviewers‘ agreement in study selection
- Data similarity graphs
- Well supported by its developers

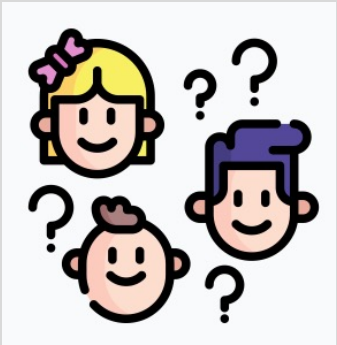
Cons:

- Rayyan is primarily a screening tool (not whole SR process
- Export facility – emailing the results
- Transitioning from title/abstract to fulltext screening
- Can be slow at times

Which one is the best for me?

Your choice may depend on…

- The degree of support you need for your review project (e.g. a tool only for screening – or for the whole process)
- the type of review you conduct
- The distribution of a tool in your research community
- Available funding
- your personal experience with conducting SRs



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Thank you!

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