

# Management/Analysis Tools for Reviews

- **James Thomas, EPPI-Centre**
- **Ethan Balk, Brown University**
- **Nancy Owens, Covidence**
- **Martin Morris, McGill Library**

**KTDRR and Campbell Collaboration Research Evidence Training  
Session 3: April 17, 2019**

Center on  
**KNOWLEDGE TRANSLATION FOR  
DISABILITY & REHABILITATION RESEARCH**

at American Institutes for Research ■

# Agenda

3:00 – 3:05: Introduction

3:05 – 3:25: **EPPI-Reviewer, James Thomas**

3:25 – 3:45: Abstrackr, Ethan Balk

3:45 – 4:05: Covidence, Nancy Owens

4:05 – 4:25: Rayyan, Martin Morris

4:25 – 4:30: Wrap-up, Evaluation

# A brief introduction to EPPI-Reviewer

James Thomas  
KTDRR and Campbell Collaboration Research Evidence  
Training:  
Management/Analysis Tools for Reviews  
April 17 2019

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# Outline

- A very brief history of EPPI-Reviewer
- The design principles of EPPI-Reviewer
- Outline of the structure of EPPI-Reviewer
- Overview of functionality
- The future

# History – key dates

Year	Milestone
1993	The 'EPIC' database was created
1995	The EPI-Centre was founded and EPIC became a multi-user database
2000	The EPPI-Centre was renamed and EPPI-Reviewer was published as a web-based systematic review platform
2008	EPPI-Reviewer version 4 was launched featuring new (at the time!) machine learning / text mining technologies
2015	Became one of Cochrane's 'author support tools', in particular to support more complex reviews
2018	EPPI-Reviewer version 5 launched internally at NICE
2018	Campbell Collaboration mapping visualisation launched
2019	EPPI-Reviewer-Web launched (name yet to be finalised) for all users

# Design principles

- **Flexibility:** supports a wide range of review / study types and uses
  - Development driven by user need
  - Does not assume one specific workflow
  - Full support for ‘mapping’ research activity
- **Completeness:** enables reviewers to conduct their entire review in the same tool
- **Analytical:** supports a range of types of analysis
- **Currency:** is up to date in terms of review methods and technology
- **Scale-ability:** tools to manage reviews with large numbers of studies
- **Not for profit:** we have to cover some costs, but any surplus is invested in new development

# Three flavours of EPPI-Reviewer

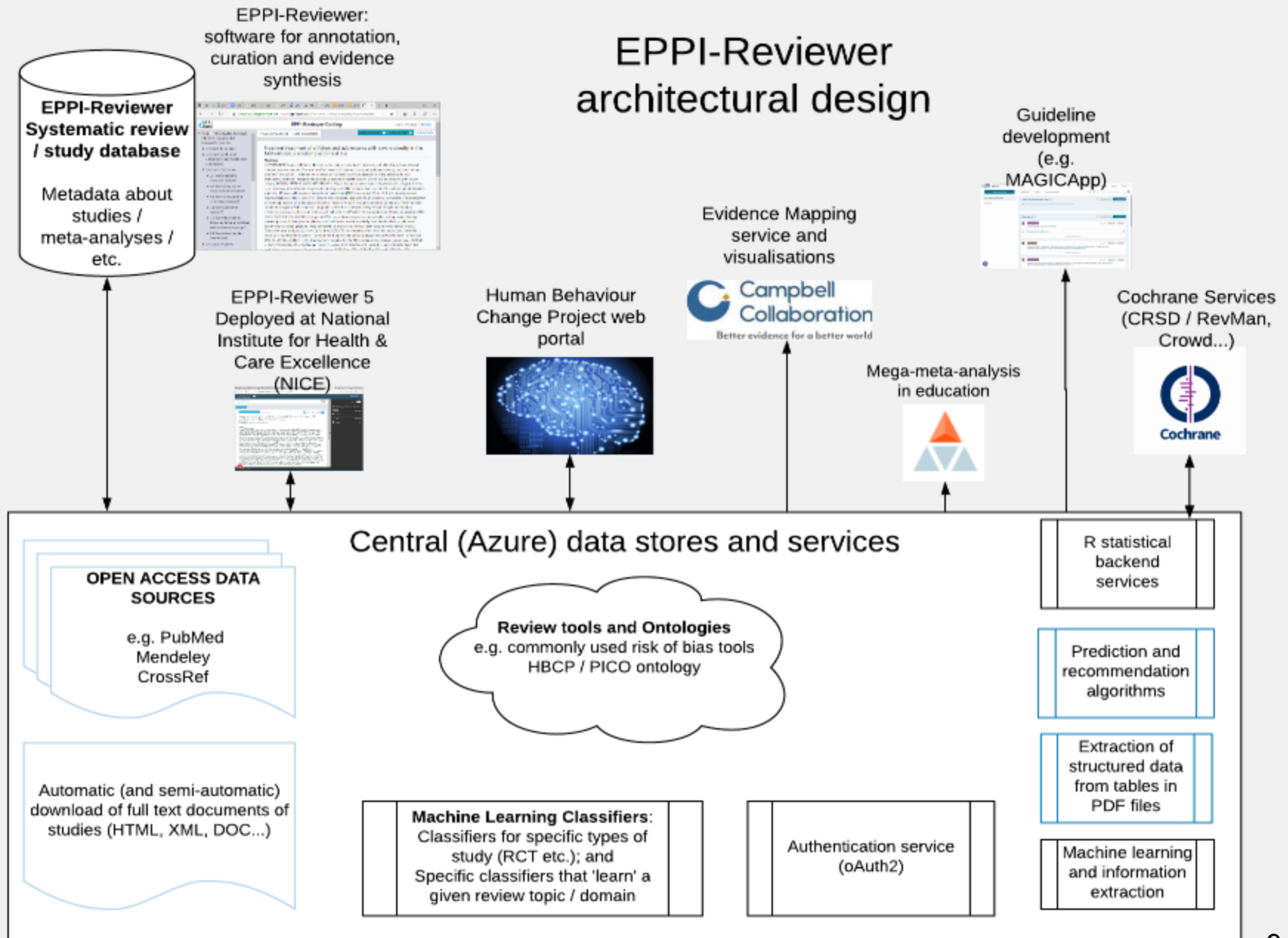
- EPPI-Reviewer 4
  - Most complete in terms of functionality
  - Requires the Silverlight browser plugin
  - Does not work on mobile devices
- EPPI-Reviewer 5
  - Designed to support NICE reviews
  - Not available outside NICE
- EPPI-Reviewer-Web
  - Accesses the same database as EPPI-Reviewer 4
  - Works in all modern web browsers (including mobile)
  - Currently a subset of EPPI-Reviewer 4 features, but will soon support everything its older cousin does

# EPPI-Reviewer: connected services

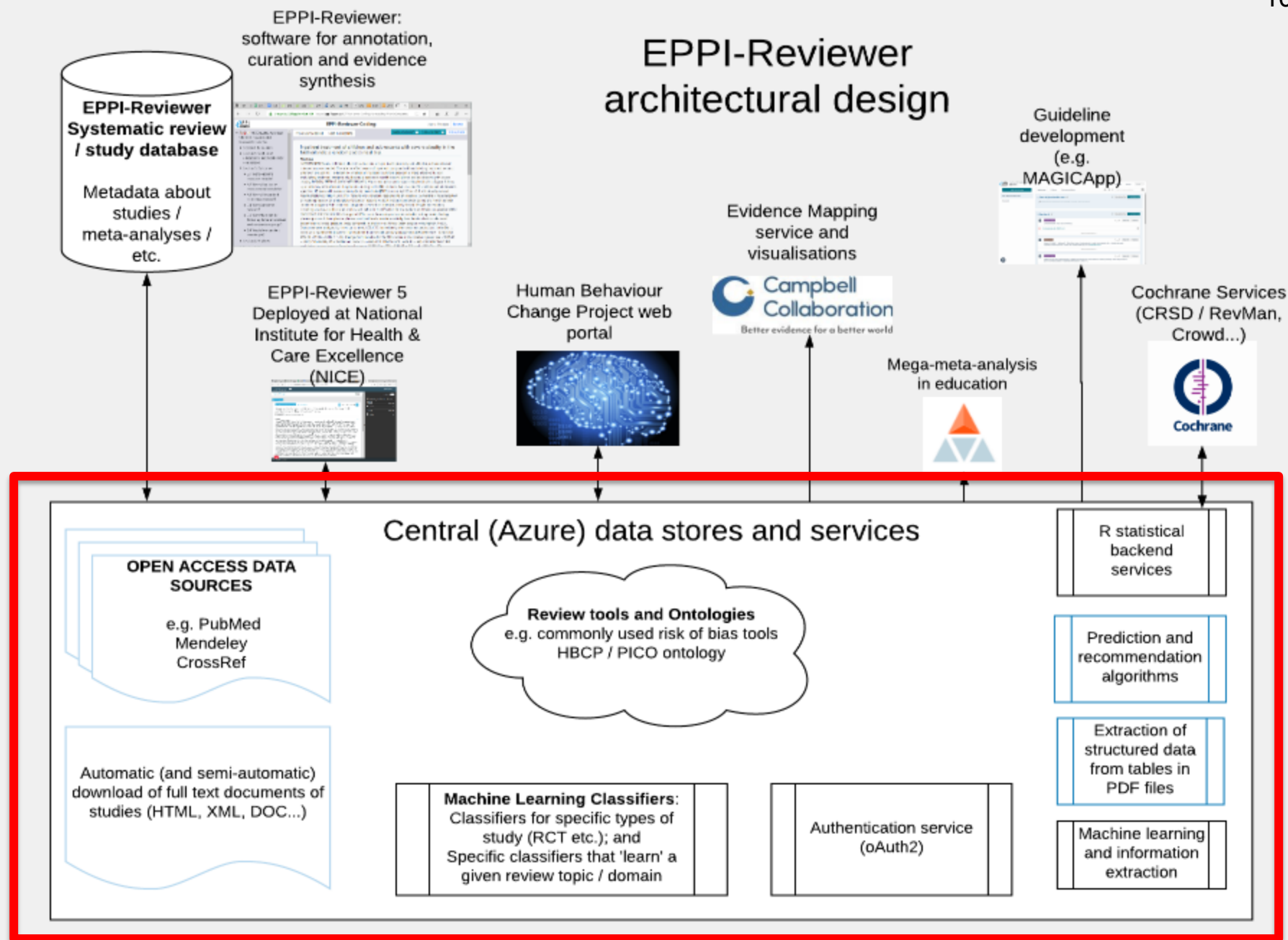
- Both EPPI-Reviewer 4 and Web
  - Use the same portal for account and user management
  - Access the same database
- EPPI-Reviewer 4, 5 and Web
  - Use the same machine learning services
- R is used for backend statistical analysis
- Microsoft Azure Machine Learning platform
- Campbell Collaboration mapping software



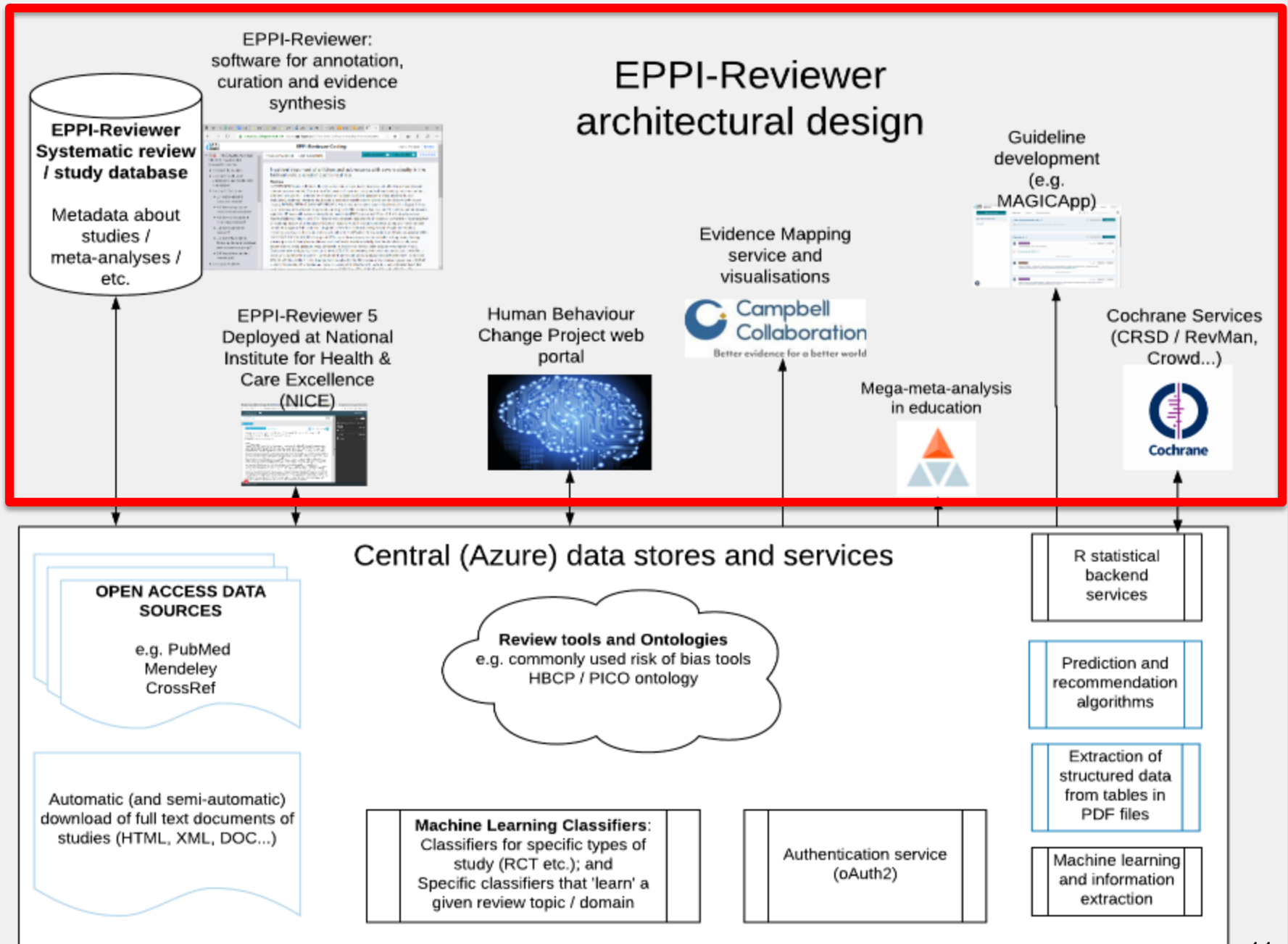
# EPPI-Reviewer architectural design



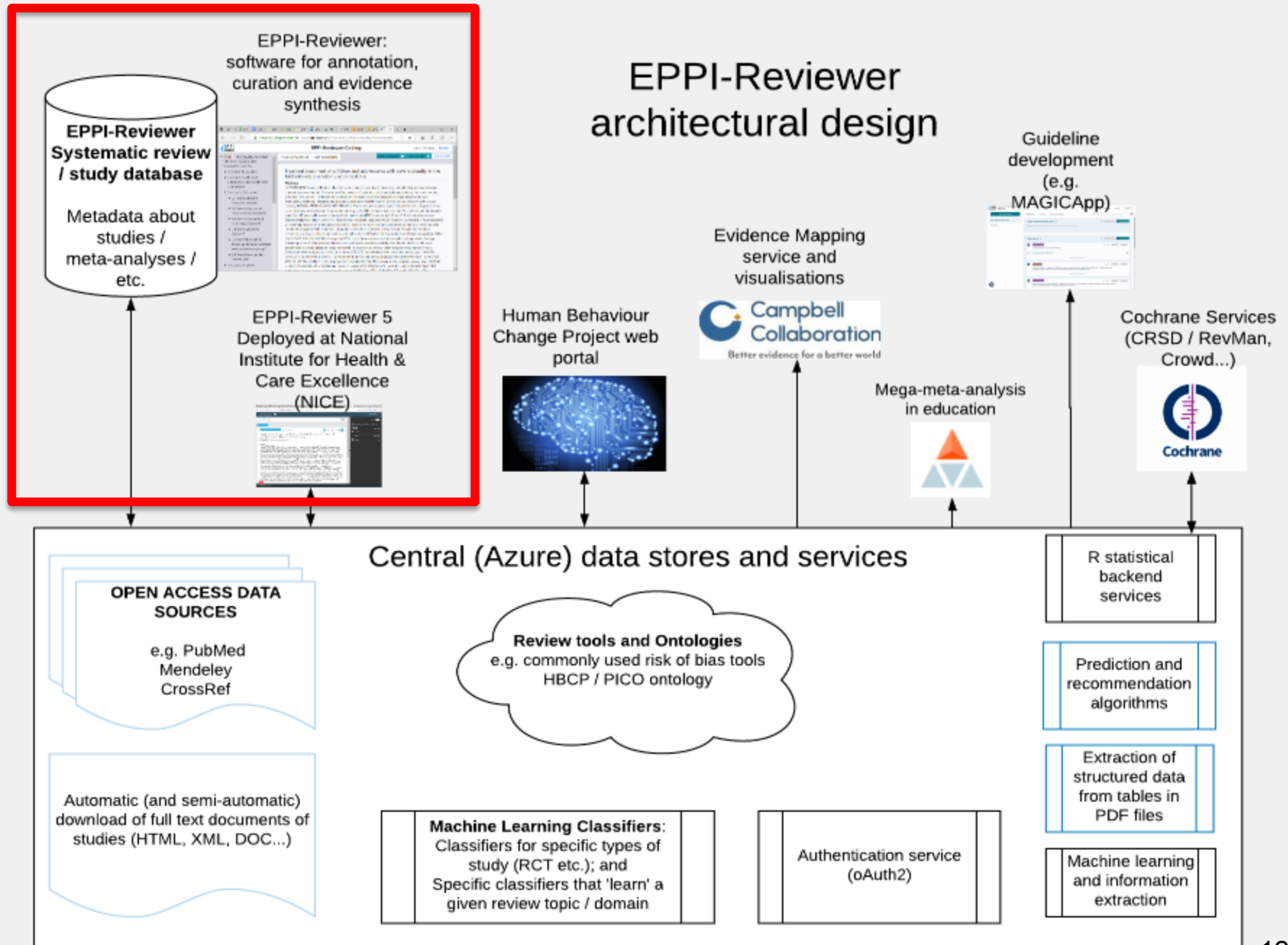
# EPPI-Reviewer architectural design



# EPPI-Reviewer architectural design



# EPPI-Reviewer architectural design



Feature Matrix	EPPI-Reviewer 4	EPPI-Reviewer 5	EPPI-Reviewer Web
<b>MULTIUSER FUNCTIONALITY</b>			
Multi-user coding	✓	✓ (excl. data extraction)	✓
Discrepancy reports / coding reconciliation	✓	✓ (excl. data extraction)	*
Assign screening / data extraction to reviewers	✓	✓	✓
<b>CHECKING FOR DUPLICATES</b>			
Run duplicate check	✓	✓	*
Manually check possible duplicates	✓	✓	*
<b>FULL DOCUMENT MANAGEMENT</b>			
Upload PDF files	✓	✓	✓
View PDF files within the program	✓		*
<b>CODING TOOL MANAGEMENT</b>			
Create / edit coding / data extraction risk of bias tools	✓	✓	✓
Select coding tool from list of generic cross-review tools	✓		✓
Share coding tools across an individuals reviews	✓	✓	✓
Share coding tools across an organisation		✓	

**APPLYING CLASSIFICATIONS TO ITEMS**

<b>APPLYING CLASSIFICATIONS TO ITEMS</b>			
<b>Screening / eligibility assessment</b>	✓	✓	✓
<b>Term highlighting</b>	✓	✓	✓
<b>Edit terms for highlighting</b>	✓	✓	
<b>Priority screening using machine learning</b>	✓	✓	✓
<b>Risk of bias assessment</b>	✓	✓	✓
<b>Data extraction</b>	✓	✓	✓
<b>Extraction of numeric outcome data</b>	✓	✓	
<b>Bulk assignment / removal of codes</b>	✓	✓	✓
<b>Line by line selecting / coding text from PDF files</b>	✓		*
<b>MACHINE LEARNING TOOLS</b>			
<b>Automatic ‘clustering’ of studies using machine learning</b>	✓		✓
<b>Machine learning classifiers for study types</b>	✓		✓
<b>‘Build your own’ machine learning classifier</b>	✓		✓


## SEARCHING, REPORTING AND ANALYSIS





















SEARCHING, REPORTING AND ANALYSIS			
Comprehensive search with search history / combine searches	✓		✓
Search / filter list of items	✓	✓	
Frequency and crosstab reports	✓	✓	✓
Individual coding reports	✓	✓	✓
Configurable 'question' reports	✓		✓
Meta-analysis	✓		
Meta-regression / subgroup analysis	✓		
Network meta-analysis	✓		
GRADE assessment	✓		
Automatic PRISMA diagrams		✓	

**Review Items**

Included: **2411** Excluded: **0** Deleted: 2398 Duplicates: 0

[My Reviews ↓](#) [My Work ↓](#) [Sources ↓](#)

**Coding Progress** 

 <b>Training Set</b>	 12	 0
 <b>Work Allocation</b>	 2398	 0
 <b>Duplicate?</b>	 7	 0
 <b>A1: Found in MAG after manual check?</b>	 84	 0
 <b>B1: Found in PubMed after manual check?</b>	 84	 0
 <b>C0-15: Factors that could explain why a Reg record is 'not found' in MAG</b>	 72	 0
 <b>D1-3: Factors that explain why a Reg record is 'hard to find' in MAG</b>	 9	 0

Your account expires on: 6/3/2020  
 Current(shared) review expires on 12/31/2020.

[Create Review](#)

[Site Admin...](#) Latest feedback: 3/6/2019



## Review home

The Review home page gives you a summary of what is happening in your review and gives you access to many of the program's functions.

### Coding progress

**Review Items**  
 Included: 636 Excluded: 0 Deleted: 3140 Duplicates: 1

**Coding Progress**

Coding Tool	Completed	Remaining
Screen on title & abstract	20	0
Screen on full report	8	0
Data extraction tool	4	0
Allocation codes	20	0
Retrieval status	8	0
Report sets	2	0
Another screening tool	0	0

On the left is an up-to-date summary of the coding that has taken place for each coding tool.

### Reviews, My Work and Sources

My Reviews ↓ My Work ↓ Sources ↓

Codes to apply	Group	Allocated	Started	Remaining
Screen on title & abstract	Group 1 T&A	20	20	0
Screen on full report	Group 1 full report	8	8	0

In the middle are the **My Reviews**, **My Work** and **Sources** buttons giving you access to your reviews, coding assignments and sources.

### Coding Tools

Feedback Help Jeff Brunton Logout

My Work ↓ Sources ↓

expires on: 22/04/2020  
 now is private (does not expire).

On the right of the screen is the **Codes** button. Click on this button to show/hide your coding tools.

### Review Items

Included: 2411 Excluded: 0 Deleted: 2398 Duplicates: 0

### Coding Progress

My Reviews ↓ My Work ↓ Sources ↓

<input type="checkbox"/>	ID	Short title <sup>1</sup>	Title	Year
<a href="#">GO</a> <input type="checkbox"/>	I 28856292	Abrantes (2014)	A preliminary randomized controlled trial of a behavioral exercise intervention for smoking cessation	2014
<a href="#">GO</a> <input type="checkbox"/>	I 28856294	Abroms (2008)	Getting young adults to quit smoking: a formative evaluation of the X-Pack Program	2008
<a href="#">GO</a> <input type="checkbox"/>	I 28856293	Abroms (2014)	A randomized trial of Text2Quit: a text messaging program for smoking cessation	2014
<a href="#">GO</a> <input type="checkbox"/>	I 28856295	Ahluwalia (2006)	The effects of nicotine gum and counseling among African American light smokers: a 2x2 factorial design	2006
<a href="#">GO</a> <input type="checkbox"/>	I 28856296	Alessi (2014)	Smoking reductions and increased self-efficacy in a randomized controlled trial of smoking abstinence-contingent incentives in residential substance abuse treatment patients	2014
<a href="#">GO</a> <input type="checkbox"/>	I 28856298	Ames (2007)	Expressive writing as a smoking cessation treatment adjunct for young adult	2007

[Edit Coding Tool\(s\)](#)

- ▶ Population
- ▼ Intervention
  - ▼ BCTs
    - ▼ 1. Goals and planning
      - 1.1. Goal setting (behavior)
      - 1.2. Problem solving
      - 1.3. Goal setting (outcome)
      - 1.4. Action planning
      - 1.5. Review behavior goal(s)
      - 1.6. Discrepancy between current behavior and goal
      - 1.7. Review outcome goal(s)
      - 1.8. Behavioral contract
      - 1.9. Commitment
    - ▶ 2. Feedback and monitoring
    - ▶ 3. Social support
    - ▶ 4. Shaping Knowledge
    - ▶ 5. Natural consequences
    - ▶ 6. Comparison of behavior
    - ▶ 7. Associations
    - ▶ 8. Repetition and substitution

## Import Coding Tools

This screen allows you to select individual Coding Tool(s) to import into your review. You can select a Coding Tool from the list below and see it displayed in the centre column. The Coding Tools that are already in your review are displayed in the third column.

### Available Coding Tools (public)

- Screen on Title & Abstract
- Screen on Full Text
- Retrieval status
- Allocations
- Risk Of Bias (Cochrane)**
- Data extraction (Home Office review guidelines)
- Screening
- Allocations and Admin
- Data Extraction
- NICE Quality appraisal checklist - qualitative studies
- NICE Quality Appraisal Checklist – quantitative interve
- CASP: 10 questions to help you make sense of qualita
- AMSTAR

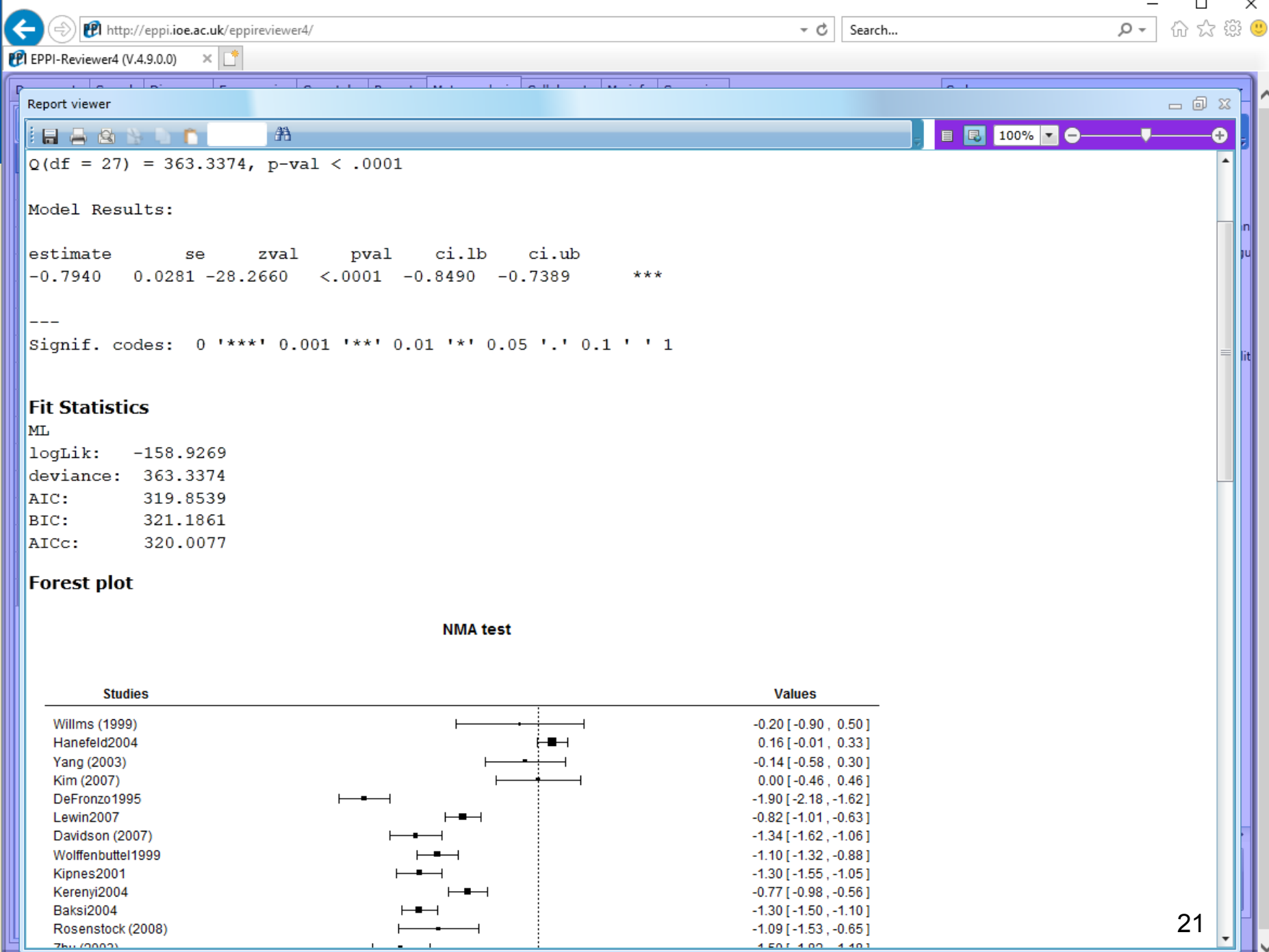
### Coding Tool Preview:

- ▼ Risk Of Bias (Cochrane)
  - ▼ Selection bias
    - ▶ Random sequence generation
    - ▼ Allocation concealment
      - Low risk
      - High risk
      - Unclear
  - ▶ Performance bias
  - ▶ Detection bias
  - ▶ Attrition bias
  - ▶ Reporting bias
  - ▶ Other bias

- ▶ Population
- ▶ Intervention
- ▶ Modes of Delivery
- ▶ Setting
- ▶ Source
- ▶ Reach
- ▶ Supplementary information
- ▶ Outcome (behaviour)
- ▶ Outcome (behaviour) value
- ▶ Effect
- ▶ OLD CODESET Population (Sprint 2)
- ▶ OLD CODESET (Target Behaviour) (Sprint 1)
- ▶ OLD CODESET (Context) (Sprint 1)
- ▶ OLD CODESET Setting (Sprint 2)
- ▶ OLD Population - non armified
- ▶ Collaborative Coding
- ▶ Arms

[Close/back](#)


Item	1. Goals and planning	3. Social support
Abrantes (2014) (ID:28856292)	<p>-1.2 Problem solving Four sessions were conducted prior to quit day (weeks 1–4) and focused on identifying high-risk situations and developing behavioral and cognitive strategies for coping with high-risk situations. Abrantes 2014.pdf: Page 4: "identifying high-risk situations and developing behavioral and cognitive strategies for coping w"</p> <p>-1.1.Goal setting (behavior) Smokers who lapsed during treatment were encouraged to set a new quit date and continue to attempt to quit. Abrantes 2014.pdf: Page 4: "set a new quit date"</p>	<p>-3.1 Social support (unspecified) Treatment was delivered in 8, 20-min weekly telephone counseling sessions beginning in week 1 of the intervention. Abrantes 2014.pdf: Page 4: "telephone counseling sessions"</p>
Abroms (2008) (ID:28856294)	<p>-1.1.Goal setting (behavior) [X-Pack] The goal of the in-person counseling session, which took place in public spaces around the college campus, was to introduce the participant to the X- Pack kit, review key information related to smoking cessation presented in the kit, and to encourage the participant to set a quit date in the next month. ++ These steps involved (a) increasing positive outcome expectations associated with quitting, (b) enlisting a QuitPal, a friend for social support, (c) setting a quit date, (d) developing the skills for overcoming cravings, and (e) quitting and preventing relapse. ++ Abroms 2008.pdf: Page 3: "encourage the participant to set a quit date"</p> <p>-1.2 Problem solving [X-Pack] These steps involved (a) increasing positive outcome expectations associated with quitting, (b) enlisting a QuitPal, a friend for social support, (c) setting a quit date, (d) developing the skills for overcoming cravings, and (e) quitting and preventing relapse. ++ Abroms 2008.pdf: Page 3: "developing the skills for overcoming cravings, and (e) quitting and preventing relapse."</p> <p>-1.1.Goal setting (behavior) [Clearing the Air (CTA)] Similar to the X-Pack Program, the goal of the in- person counseling session was to introduce the participant to the materials, go over key information related to smoking cessation as presented in the materials, and encourage the participant to set a quit date in the next month. Abroms 2008.pdf: Page 4: "set a quit date in the next month"</p>	<p>-3.1 Social support (unspecified) [X-Pack] These steps involved (a) increasing positive outcome expectations associated with quitting, (b) enlisting a QuitPal, a friend for social support, (c) setting a quit date, (d) developing the skills for overcoming cravings, and (e) quitting and preventing relapse. ++ In-person counselling sessions + Abroms 2008.pdf: Page 3: "social support"</p> <p>-3.1 Social support (unspecified) [Clearing the Air (CTA)] Similar to the X-Pack Program, the goal of the in- person counseling session was to introduce the participant to the materials, go over key information related to smoking cessation as presented in the materials, and encourage the participant to set a quit date in the next month. Abroms 2008.pdf: Page 3: "counseling session"</p>
Abroms (2014) (ID:28856293)	<p>-1.2 Problem solving [Text2Quit] Participants who report that they have not quit are routed into a separate relapse message protocol, which includes the option of setting a new quit date. + "the option of setting a new quit date" + Abroms 2014.pdf: Page 3: "relapse message"</p>	<p>-3.1 Social support (unspecified) [Text2Quit] The text messages are timed around a user's quit date and provide advice on quitting smoking. + Abroms 2014.pdf: Page 2: "provide advice"</p>
Ahluwalia	<p>-1.2 Problem solving [Nicotine Gum + Health Education (HE)] During HE sessions, trained counselors used the OKIS II Quit Smoking Guide and semistructured scripts to review the addictive nature of nicotine, health consequences of smoking and benefits of quitting, and provided concrete strategies on developing a quit plan and identifying alternatives against triggers to smoke. Ahluwalia 2006 (c) primary paper .pdf: Page 4: "identifying alternatives against triggers to smoke."</p>	<p>-3.1 Social support (unspecified) In general, participants received counseling from the same person for</p>



EPPI-Reviewer Web (Beta)

EPPI-Mapper

[University College London \[GB\]](#) | <https://eppi.ioe.ac.uk/EPPIReviewer-Web/Main>



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James Thomas
[Logout](#)

[Review home](#)
[References](#)
[Frequencies](#)
[Crosstabs](#)
[Search & Classify](#)
[Collaborate](#)

New Search

Refresh List

Delete Selected

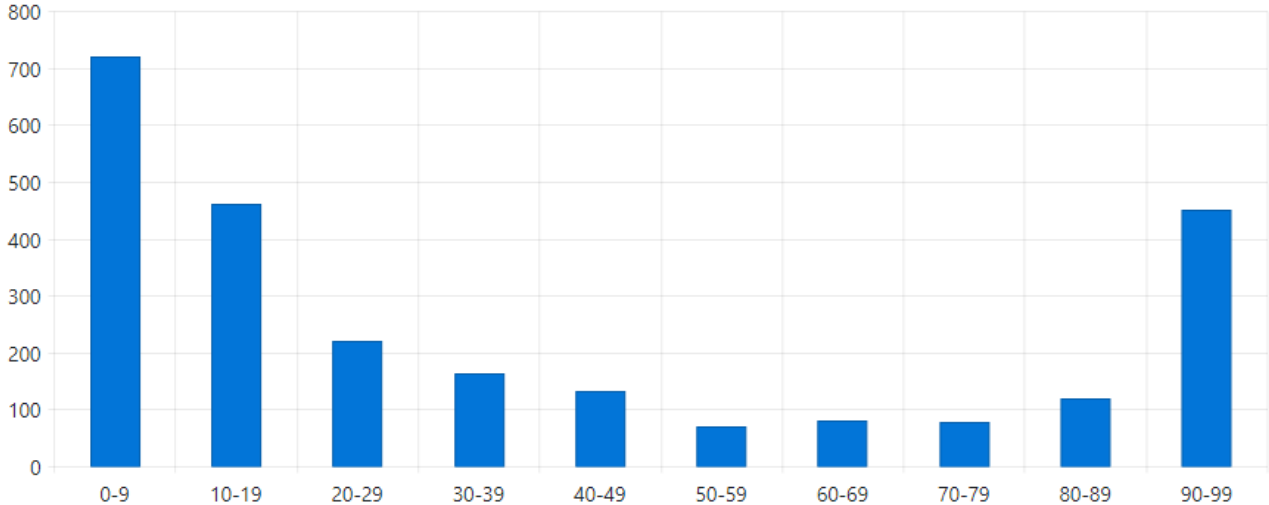
Combine

Build Model

Classify

To create codes to represent the classifier result, please select a code on the right.

Items classified according to model: RCT



Age Group	Count
0-9	725
10-19	470
20-29	225
30-39	170
40-49	135
50-59	75
60-69	85
70-79	80
80-89	125
90-99	455

Save

Close

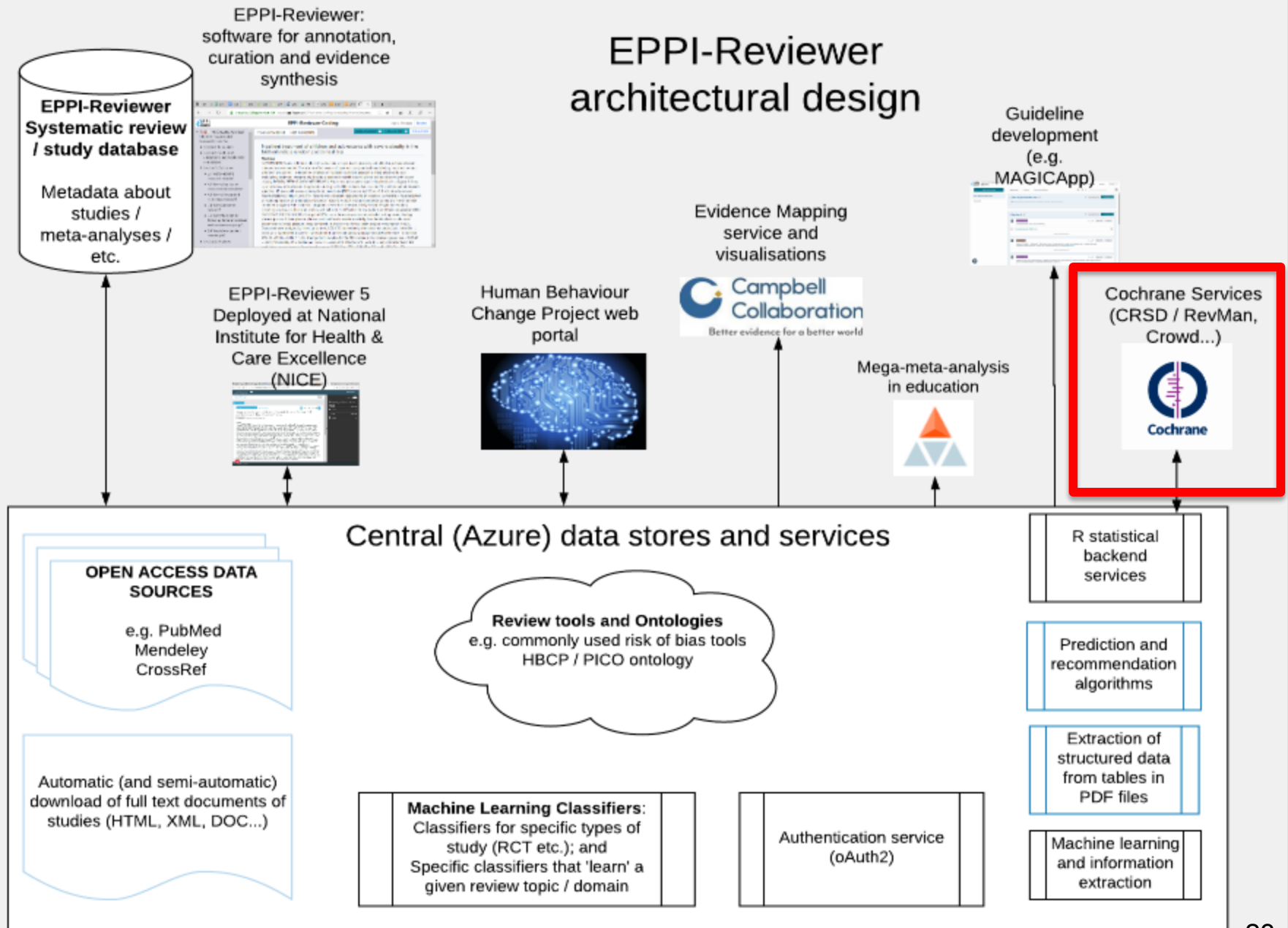
Edit Coding Tool(s)

- Screen on Title & Abstract
- test
- NICE Quality Appraisal Checklist – quantitative intervention studies
- Data extraction (Home Office review guidelines)
- Intervention details
- SLIM data
- Ruth test codes
- NICE Quality appraisal checklist qualitative studies
- Risk Of Bias (Cochrane)
- Lingo3G clusters
- My new screening code set
- data extraction for outcomes

Codes

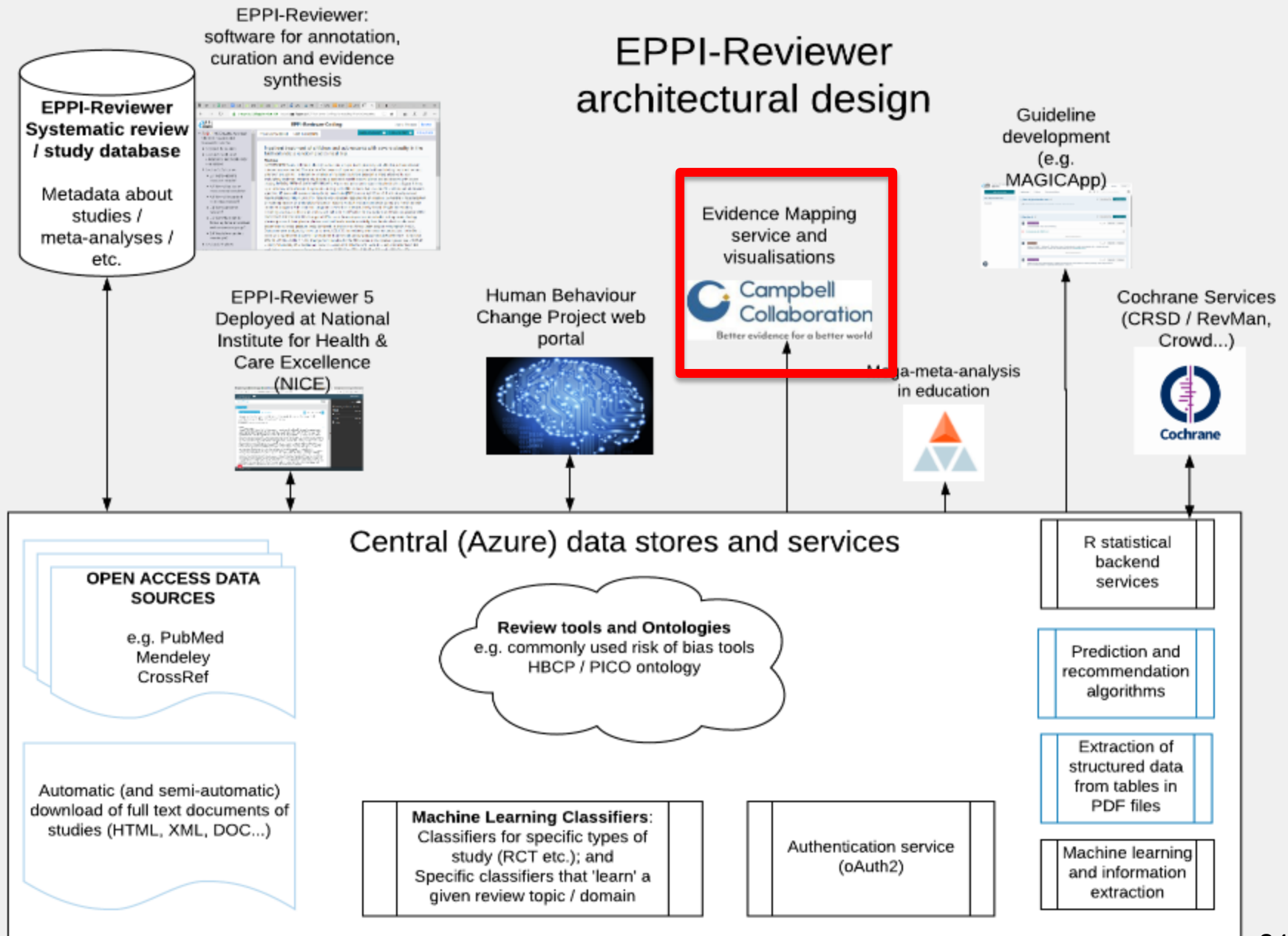
No...	Name	Created By	Date	Hits	Classi...
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# EPPI-Reviewer architectural design

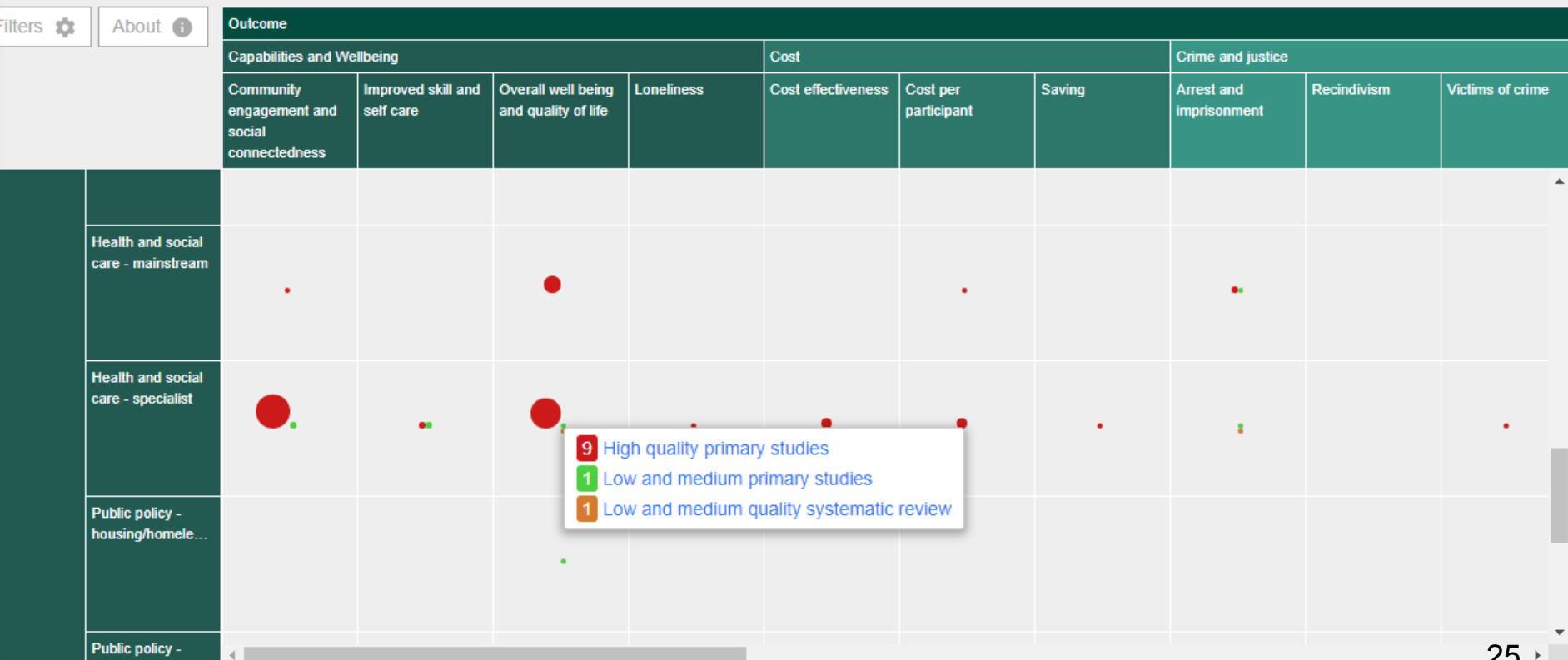




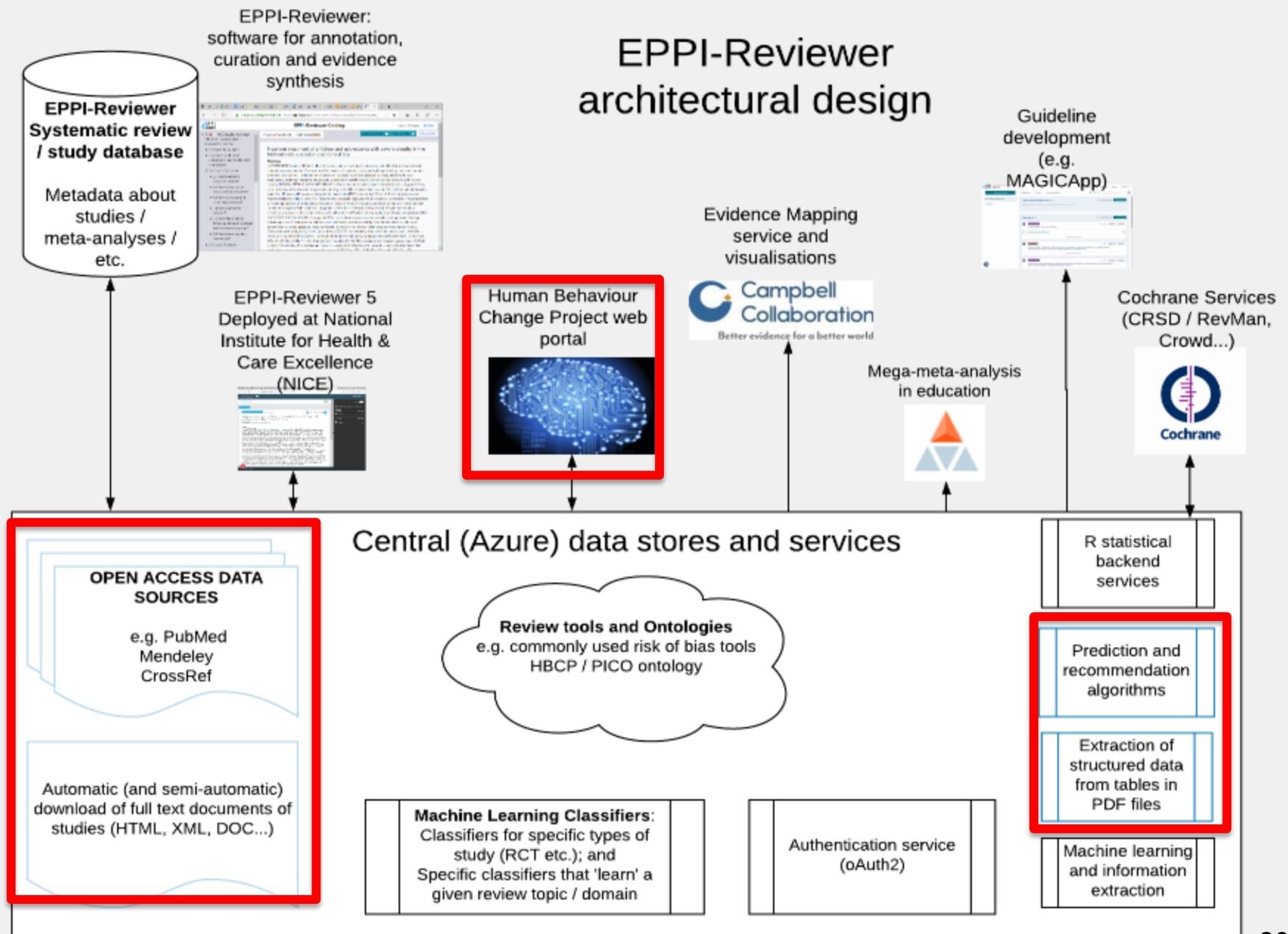
# EPPI-Reviewer architectural design







# EPPI-Reviewer architectural design



# The future...

- More (semi) automation –
  - Support for extraction of study characteristics
  - Extraction of data from tables / graphs
  - Automatic updates / ‘Living’ systematic reviews (key area of research & development)
  - More support for mapping (visualisations)

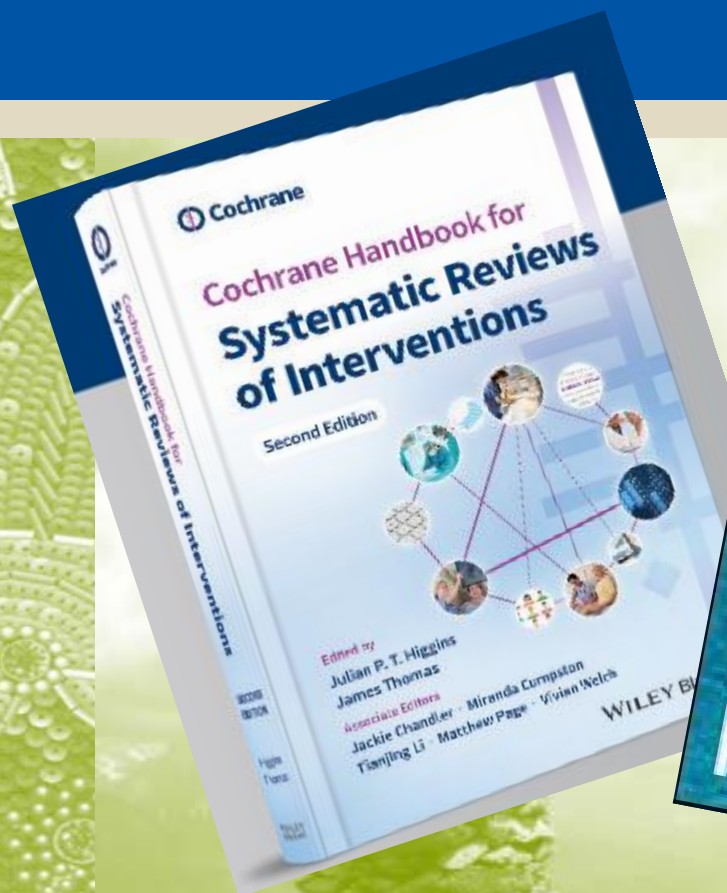
# Any questions?

- Go to: <https://eppi.ioe.ac.uk/> to find out more

## Thank you

EPPI-Centre website:  
<http://eppi.ioe.ac.uk>

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The EPPI-Centre is part of the Social Science Research Unit at the UCL Institute of Education, University College London

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# Thank you!

*Please take a few minutes to respond to the brief Evaluation Survey:*

[www.surveygizmo.com/s3/4936232/Evaluation-Session3-Management-Analysis-Tools](http://www.surveygizmo.com/s3/4936232/Evaluation-Session3-Management-Analysis-Tools)

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