

Systematic App Reviews (SMAR) User Guide

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I. SMAR Background

An SMAR (systematic app review) can be generally classified as a search and subsequent analysis of applications that meet certain criteria across a set of mobile app stores. Search criteria can include keywords, download count, and other information available in the corresponding app's store page. The search results from the SMAR include large-scale app metadata – such as user reviews and app permissions – as well as app contents such as functionality or accessibility.

The general steps of an SMAR can be classified as follows:

First, the researcher plans the topic, scope, and timeline of their app review. *Second*, they select a corpus of mobile apps. *Third*, they extract data for analysis, e.g., user reviews or app files. *Fourth*, they analyze their data, using either qualitative, quantitative, or automated analysis. *Fifth*, they report their method and findings.

Table 1: Steps of a Systematic Mobile App Review

	Step 1 Planning	Step 2 App selection	Step 3 Data Extraction	Step 4 Analysis	Step 5 Reporting
Description	Plan topic and scope	Select a corpus of mobile apps	Extract data e.g., user reviews or app files	Analyze data: many methods to choose from	Report methods and findings
Example Activities	- Define research questions - Set timeline	- Set inclusion / exclusion criteria - Search app store(s)	- Scrape user reviews - Install app files	- Qualitative, quantitative, or automated analysis	- Create flow diagram - Release dataset - Report results
		Scrape app metadata, e.g., permissions			
Challenges for researchers	- Lack of step-by-step guidelines - Lack info on study design tradeoffs	- Requires technical expertise - Existing tools poorly documented & maintained		- Requires domain expertise - Limited awareness of automated analysis	- No reporting standards - Results lack transparency

Why would I want to conduct an SMAR?

Conducting an SMAR is a valuable way for researchers to quickly yet effectively collect targeted mobile application data at scale. This is the starting point for many research studies aiming to analyze a subset of the existing catalog of millions of mobile applications across different platforms.

The SMAR method has been used in many fields. In the field of HCI (Human-Computer Interaction), researchers have studied how children perceive parental control apps [1,5,8], user reviews of mental health apps [6], dark patterns in Japanese apps [7], and missing label accessibility failures in Android apps [4]. In health, researchers have examined apps for child development [3], support functions in pain management apps [2], and menstrual tracking apps [9]. All of these studies started with a systematic search of app store(s).

Existing SMAR tools are either paid products targeted towards commercial developers, or free tools that require technical expertise to get up and running. Our free SMAR tool aims to provide a flexible feature set and intuitive interface to enable researchers of all backgrounds to quickly yet effectively conduct SMAR's.

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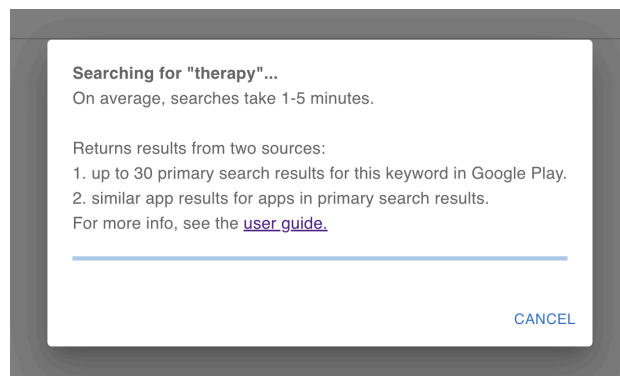
II. How to use the SMAR Tool

The SMAR Tool is designed around the central search bar that allows users to quickly retrieve a filtered list of applications from the Google Play Store.

1. To get started, type in a search keyword **(1)**. Optionally, check the 'Show permissions' button to also retrieve permissions (such as microphone or camera access) used by individual apps **a)**. Click on the 'Search' button **(2)** to begin the search process.

The screenshot shows the SMAR Tool interface. At the top is a blue navigation bar with the text 'SMAR' on the left and 'HOME USER GUIDE CITATION ABOUT' on the right. Below the navigation bar is a white section with the title 'Systematic Mobile Application Reviews' and a 'BETA' badge. Under the title is a subtitle: 'A tool for academic researchers to conduct a keyword search of Google Play and get back the metadata for all relevant apps.' The main content area features a search bar with the placeholder text 'Search by keyword (e.g., puzzle games) or package name (e.g., com.facebook.katana)'. A red circle labeled '1)' is around the search bar. To the right of the search bar is a blue 'SEARCH' button with a magnifying glass icon, labeled '2)'. Below the search bar is a checkbox labeled 'a)' with the text 'Show permissions' and a small information icon. Below the checkbox are 'Example Searches: MEDICATION REMINDERS SELF-CARE SMARTPHONE ADDICTION'. Below that is 'Example Research:' followed by three citations: 'Stawarz et al. (2014) reviewed the functionality and user reviews for 229 medication reminder apps', 'Lyngs et al. (2019) coded the features in 96 digital self-control apps', and 'Spors et al. (2021) employed feminist content analysis to review the descriptions of 69 self-care apps'.

2. Now a dialog box will appear with the following message: "Searching for **your keyword**". This will take a couple of minutes to complete.



3. Once the search has completed, a portion of the page will update with search results. A preview of the first few results will be visible (3) and are horizontally scrollable, and the rest of the results can be downloaded by clicking the button at the bottom of the page (4). Additionally, user reviews for each application can be scraped by clicking the corresponding row's 'scrape reviews' button (5).

The screenshot displays the SMAR (Systematic Mobile Application Reviews) web application. At the top, a blue header contains the logo 'SMAR' and navigation links: 'HOME', 'USER GUIDE', 'CITATION', and 'ABOUT'. The main heading is 'Systematic Mobile Application Reviews' with a 'BETA' badge. Below this is a subtitle: 'A tool for academic researchers to conduct a keyword search of Google Play and get back the metadata for all relevant apps.' A search bar contains the text 'therapy', and a blue 'SEARCH' button is to its right. Below the search bar is a checkbox labeled 'Show permissions' with an information icon. A green-bordered box labeled '3)' contains the search results. The results are titled 'Results for "therapy"' and 'Preview of first 5 out of 86 results'. A table lists five apps with columns for Title, App ID, Reviews, Icon, and Developer. A purple box labeled '5)' highlights the 'SCRAPE REVIEWS' button in the 'Reviews' column for each app. Below the table, a blue button labeled '4)' says 'DOWNLOAD 86 RESULTS'.

Title	App ID	Reviews	Icon	Developer
BetterHelp - Therapy	com.betterhelp	7545		BetterHelp - Ther...
Wysa: Anxiety, therapy ch...	bot.touchkin	17409		Touchkin
Talkspace Therapy & Cou...	com.talkspace.tal...	2460		Talkspace
MyPossibleSelf: Mental H...	com.mypossibles...	426		My Possible Self Ltd
Youper - CBT Therapy Ch...	br.com.youper	8999		Youper, Inc

4. To begin another search, repeat steps 1-3.