RESEARCH METHODOLOGY IN SE
SYSTEMATIC LITERATURE REVIEW

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CONTENTS

- What is Systematic literature review?

- Why we do Systematic Literature review?

- Features of Systematic Literature review?

- How we do Systematic literature review?

- Reporting your findings.

- Does and don'ts in literature review.

- What next?!

Final Term Project

✓ Conduct a comprehensive Systematic Literature Review (SLR).

✓ Following the SLR method.

✓ Topic should be same as Mid Term.

✓ Group must be same as Mid Term.

✓ Specific Detail will be uploaded by this week!

WHAT IS LITERATURE REVIEW?

A systematic literature review is a means of

- ✓ identifying, evaluating and interpreting
- ✓ all available research
- ✓ relevant to a particular research question, or topic area, or phenomenon of interest.

Primary studies: Individual studies contributing to a systematic review are called primary studies.

Secondary study: a systematic review is a form a secondary study.

WHY WE DO LITERATURE REVIEW?

- **To summarize the existing evidence** concerning a topic or technology.

- To identify any **gaps in current research** in order to suggest areas for further investigation.

- To provide a **framework/background** in order to appropriately position new research activities.

- To examine the **extent to which empirical evidence supports/contradicts** theoretical hypotheses, or even to assist the generation of new hypotheses.

WHY WE DO LITERATURE REVIEW? - SIGNIFICANCE

- Most research starts with a literature review of some sort.

- However, unless a literature review is **thorough and fair**, it is of little scientific value. This is the **main rationale** for undertaking systematic reviews.

  - Systematic reviews must be undertaken in accordance with a predefined search strategy.

  - The search strategy must allow the completeness of the search to be assessed.

  - Researchers performing a systematic review must make every effort to identify and report research that is unbiased and does not support a particular point of view that they wish to establish.

FEATURE OF SYSTEMATIC LITERATURE REVIEWS

- Systematic reviews start by **defining a review protocol** that specifies the research question being addressed and the **methods** that will be used to perform the review.

- Systematic reviews are based on a **defined search strategy** that aims to detect as much of the relevant literature as possible.

- Systematic reviews **document their search strategy** so that readers can access its rigour and completeness.

FEATURE OF SYSTEMATIC LITERATURE REVIEWS

- Systematic reviews require **explicit inclusion and exclusion criteria** to assess each potential primary study.

- Systematic reviews specify **the information to be obtained** from each primary study including quality criteria by which to evaluate each primary study.

- A systematic review is a **prerequisite** for quantitative meta-analysis.

HOW WE DO THE SYSTEMATIC LITERATURE REVIEW

THE REVIEW PROCESS

Three main phases:

- ✓ Planning the Review
- ✓ Conducting the Review
- ✓ Reporting the Review.
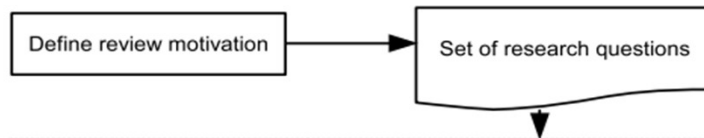
THE REVIEW PROCESS

Three main phases:

- ✓ Planning the Review
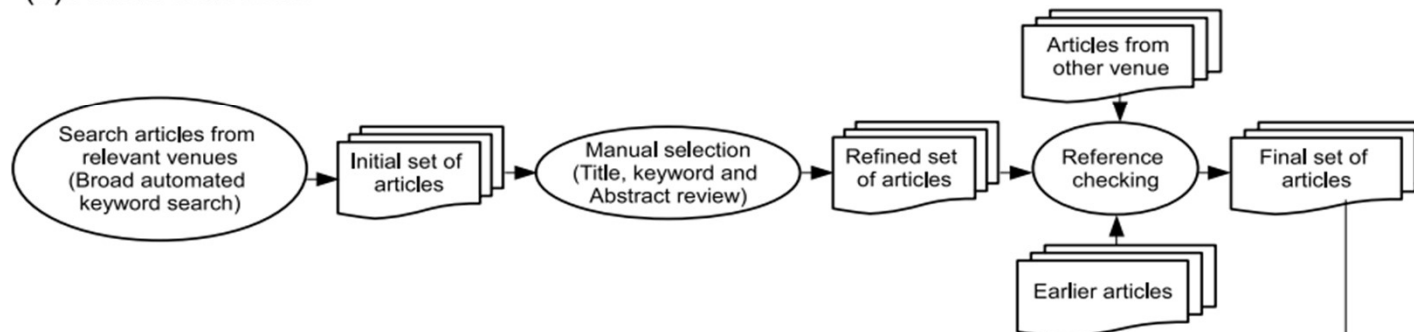- ✓ Conducting the Review
- ✓ Reporting the Review.

Planning the review are:

1. Identification of the need for a review
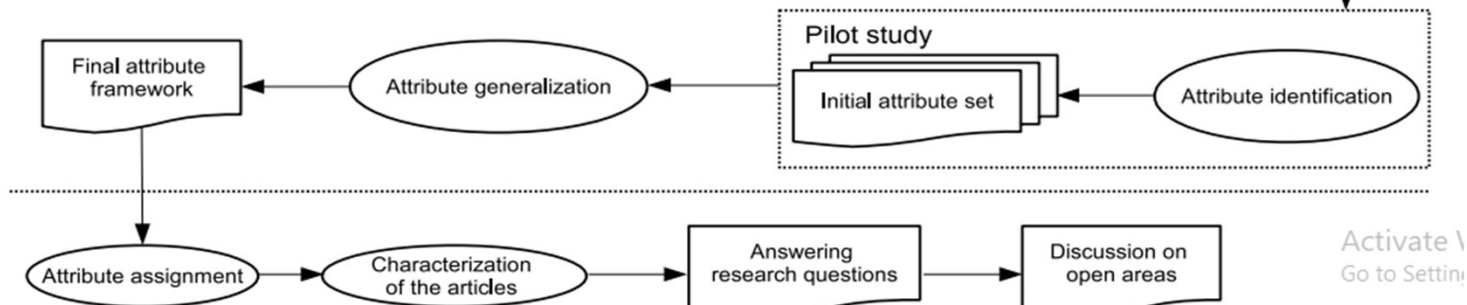
2. Development of a review protocol.

(a) Review Objective

```
[Define review motivation] ──► [Set of research questions]
                                         │
                                         ▼
```

(b) Article Selection

```
(Search articles from       [Initial set of    (Manual selection       [Refined set    (Reference    [Final set of
relevant venues       ──►    articles]    ──►   (Title, keyword and  ──► of articles] ──► checking) ──► articles]
(Broad automated                                Abstract review))
keyword search))
```

Articles from other venue

Earlier articles

(c) Attribute framework

```
[Final attribute      (Attribute          ┌── Pilot study ──────────────────────────────┐
framework]     ◄──    generalization)  ◄──│  [Initial attribute set]  ◄──  (Attribute    │
     │                                     │                                identification)│
     │                                     └───────────────────────────────────────────────┘
     ▼
(Attribute      ──► (Characterization  ──► [Answering          ──► [Discussion on
assignment)          of the articles)       research questions]       open areas]
```

Activate \
Go to Settin:

(d) Article Assessment

THE REVIEW PROCESS

Three main phases:

- ✓ Planning the Review
- ✓ Conducting the Review
- ✓ Reporting the Review.

Conducting the review are:

1. Identification of research
2. Selection of primary studies
3. Study quality assessment
4. Data extraction & monitoring
5. Data synthesis.

THE REVIEW PROCESS

All these stages are not sequential even though they appear such! There are iterations and refinement involved.

For example,

❑ The selection of primary studies is governed by inclusion and exclusion criteria. These criteria are initially specified when the protocol is defined but may be refined after quality criteria are defined.

❑ Data extraction forms initially prepared during construction of the protocol will be amended when quality criteria are agreed.

❑ Data synthesis methods defined in the protocol may be amended once data has been collected.

PLANNING THE REVIEW

PLANNING THE REVIEW – IDENTIFYING THE NEED.

✓ What are the **review's objectives**?

✓ What **sources were searched** to identify primary studies? Were there any restrictions?

✓ What were the **inclusion/exclusion** criteria and how were they applied?

✓ What criteria were used to **assess the quality** of primary studies and how were they applied?

✓ How were the **data extracted** from the primary studies?

✓ How were the **data synthesised**? How were differences between studies investigated? How were the data combined? Was it reasonable to combine the studies? Do the conclusions flow from the evidence?

PLANNING THE REVIEW – DEVELOPING REVIEW PROTOCOL.

PLANNING THE REVIEW – DEVELOPING REVIEW PROTOCOL.

- ✓ Background. The **rationale** for the survey.

- ✓ The **research questions** that the review is intended answer.

- ✓ The strategy that will be used to **search for primary studies**: search terms, resources (e.g., databases, specific journals, and conference proceedings). An initial scoping study can help determine an appropriate strategy.

- ✓ Study **selection criteria and procedures:** Determine criteria for including in, or excluding a study from. It is usually helpful to **pilot the selection criteria** on a subset of primary studies. The protocol should describe **how the criteria will be applied** e.g. how many assessors will evaluate each prospective primary study, and how disagreements among assessors will be resolved.

PLANNING THE REVIEW – DEVELOPING REVIEW PROTOCOL.

✓ Study **quality assessment** checklists and procedures. The researchers should develop quality checklists to assess the **individual studies**.

✓ **Data extraction** strategy. This should define how the information required from each primary study **would be obtained**. If the data require manipulation or assumptions and inferences to be made, the protocol should specify an appropriate validation process.

✓ **Synthesis of the extracted data**. This should define the **synthesis strategy**. This should clarify whether or not a **formal meta-analysis** is intended and if so what techniques will be used.

✓ **Project timetable**. This should define the review plan.