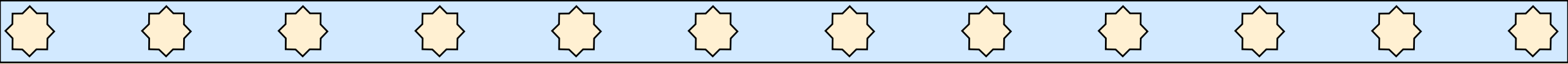


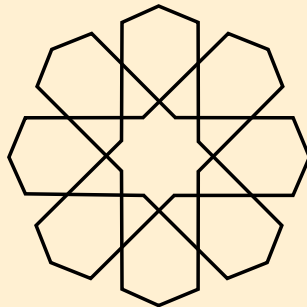
# Scientific Method for Wikimedians

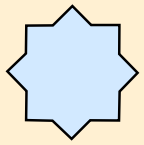
## Research Question



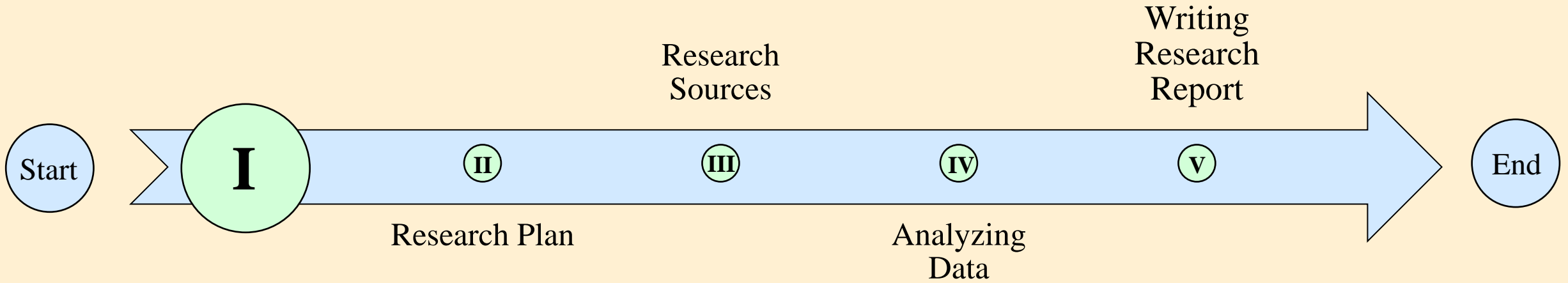
**Michel BAKNI**

**2023**





# Course Structure



## Part I: Knowledge & Scientific Method

**Chapter 1:** Knowledge & its Types

**Chapter 3:** Research Methodology

**Chapter 2:** Scientific Facts

**Chapter 4:** Scientific Method

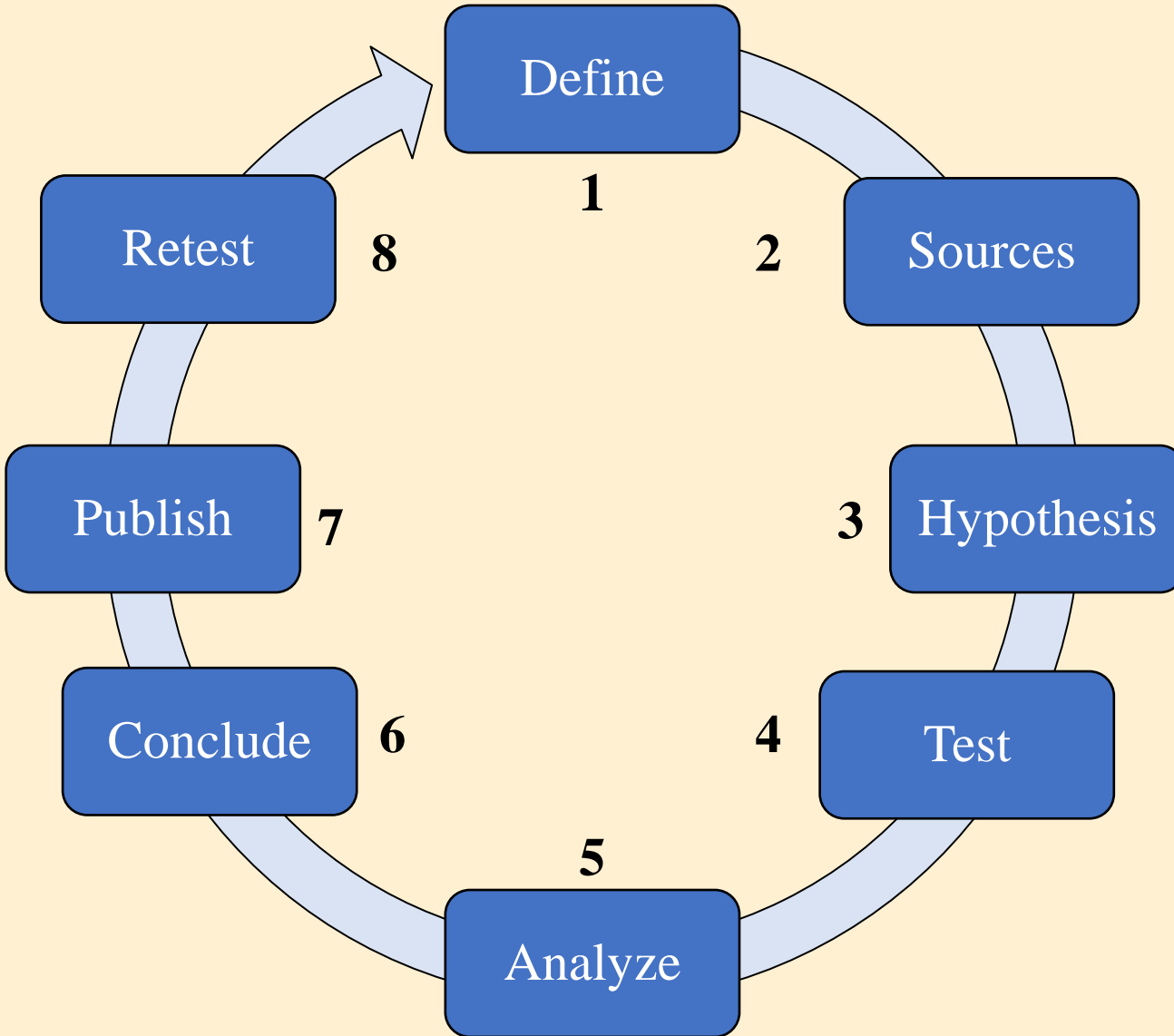
**Chapter 5:** Research Question



# Outlines

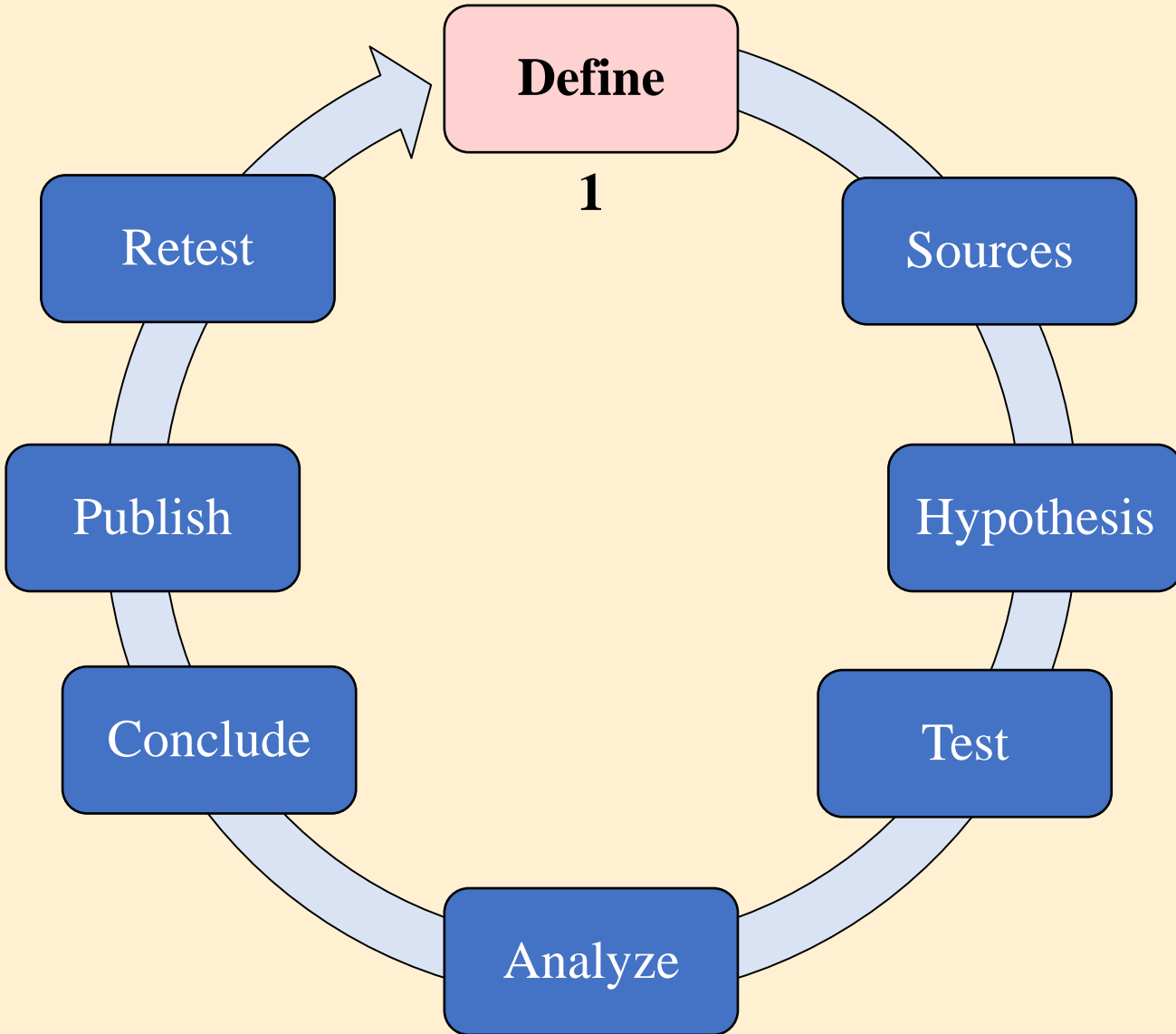
- ★ **Reminder: The scientific method**
- ★ **Basic skills**
- ★ **Searching for a problem**
- ★ **Research problem properties**
- ★ **Notes on the research problem**

# I Reminder: The scientific method



1. **Define problem**
2. **State-of-the-art**
3. **Form hypothesis**
4. **Test hypothesis**
5. **Analyze data**
6. **Interpret data & draw conclusions**
7. **Publish results**
8. **Retest**

# I Reminder: The scientific method



## ★ Define research problem

- ★ Detailed & clear problem
- ★ Must be based on others' work
- ★ Hardest step & large impact
- ★ 5W1H help formulating problem

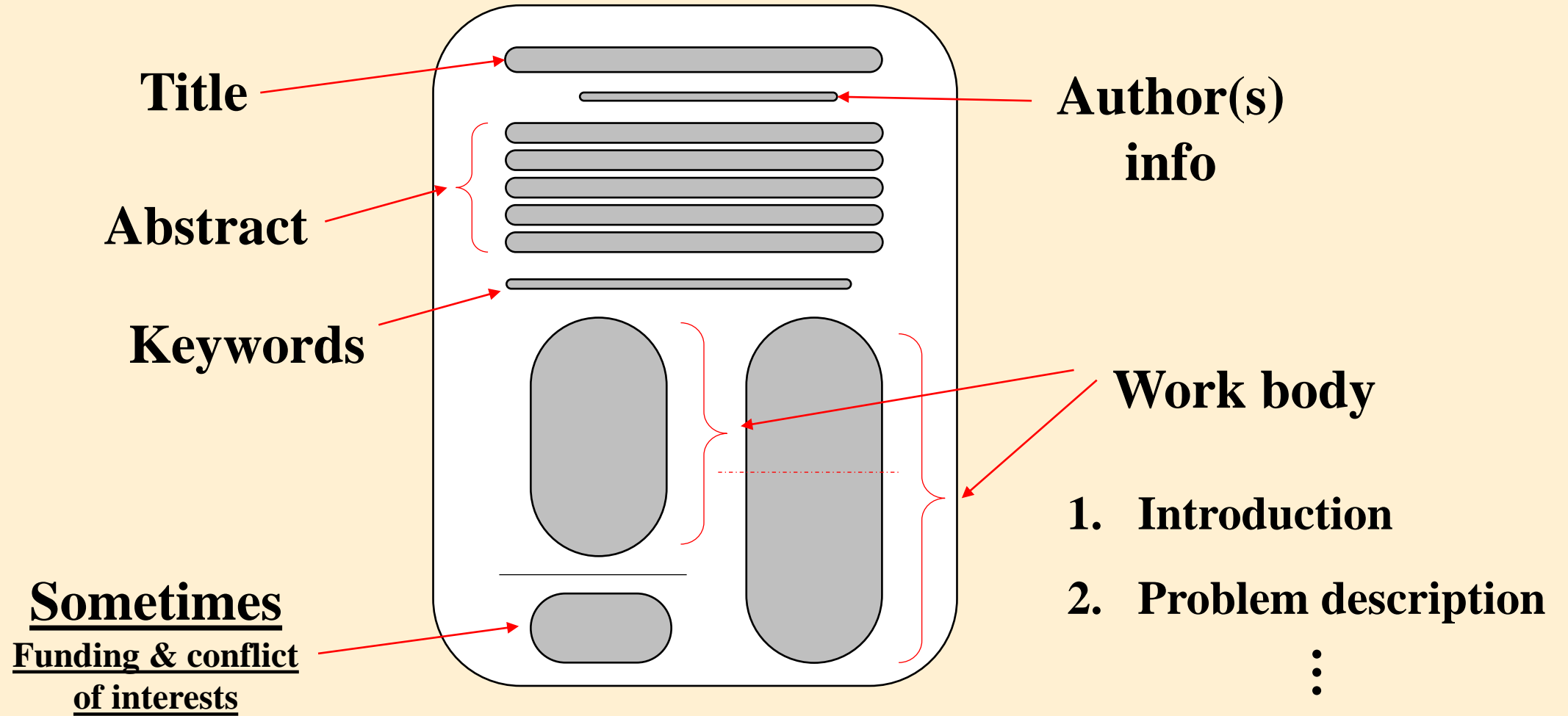
## II Basic skills: introduction

★ Needed to easily define the problem

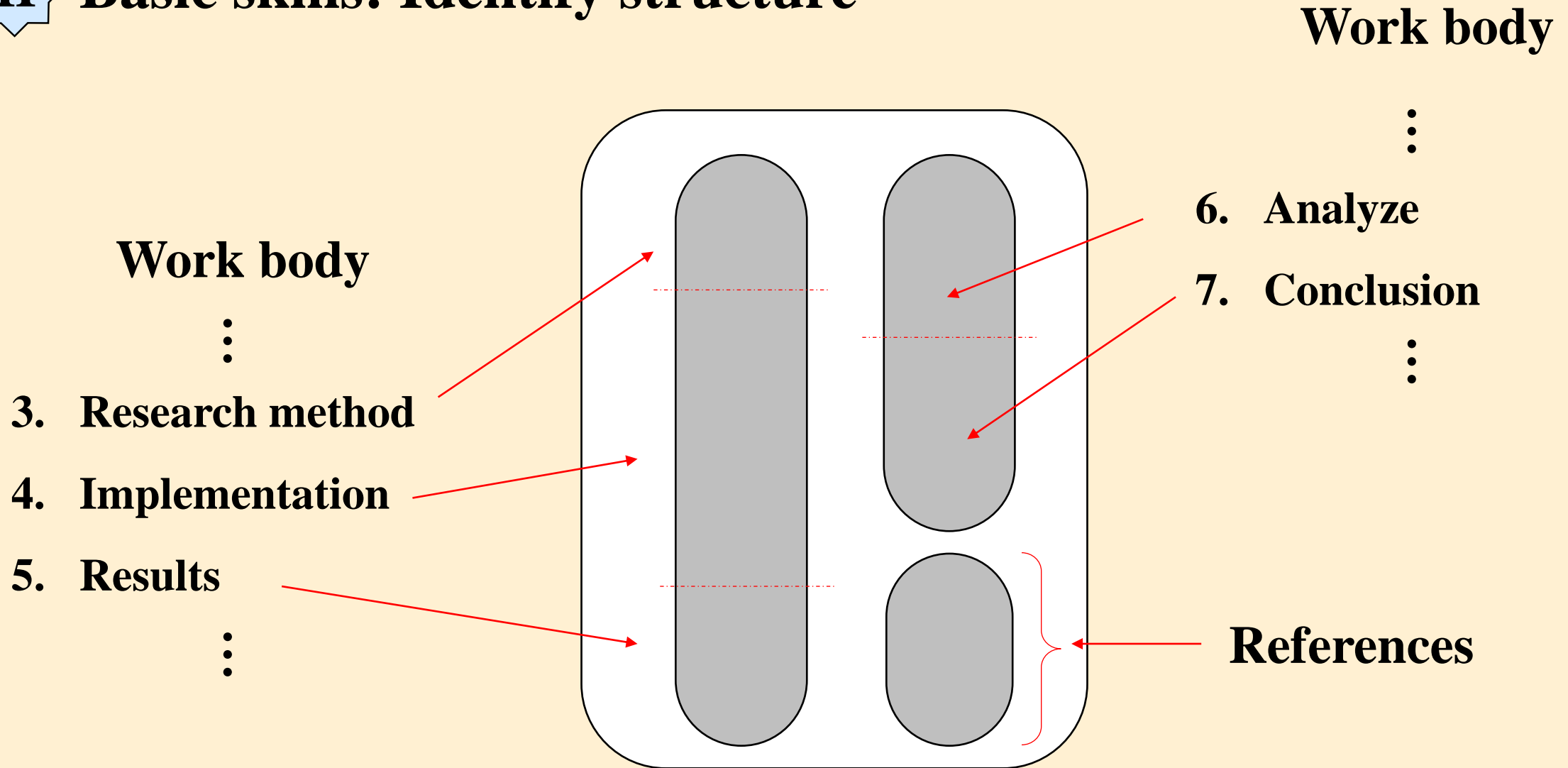
★ 4 skills:

- ◆ Identify structure: scientific work
  - Thesis
  - Article
  - Report
- ◆ Selective reading: chose what to read
- ◆ Authority control: system of identifiers
- ◆ Card system: organize obtained knowledge

## II Basic skills: Identify structure



## II Basic skills: Identify structure

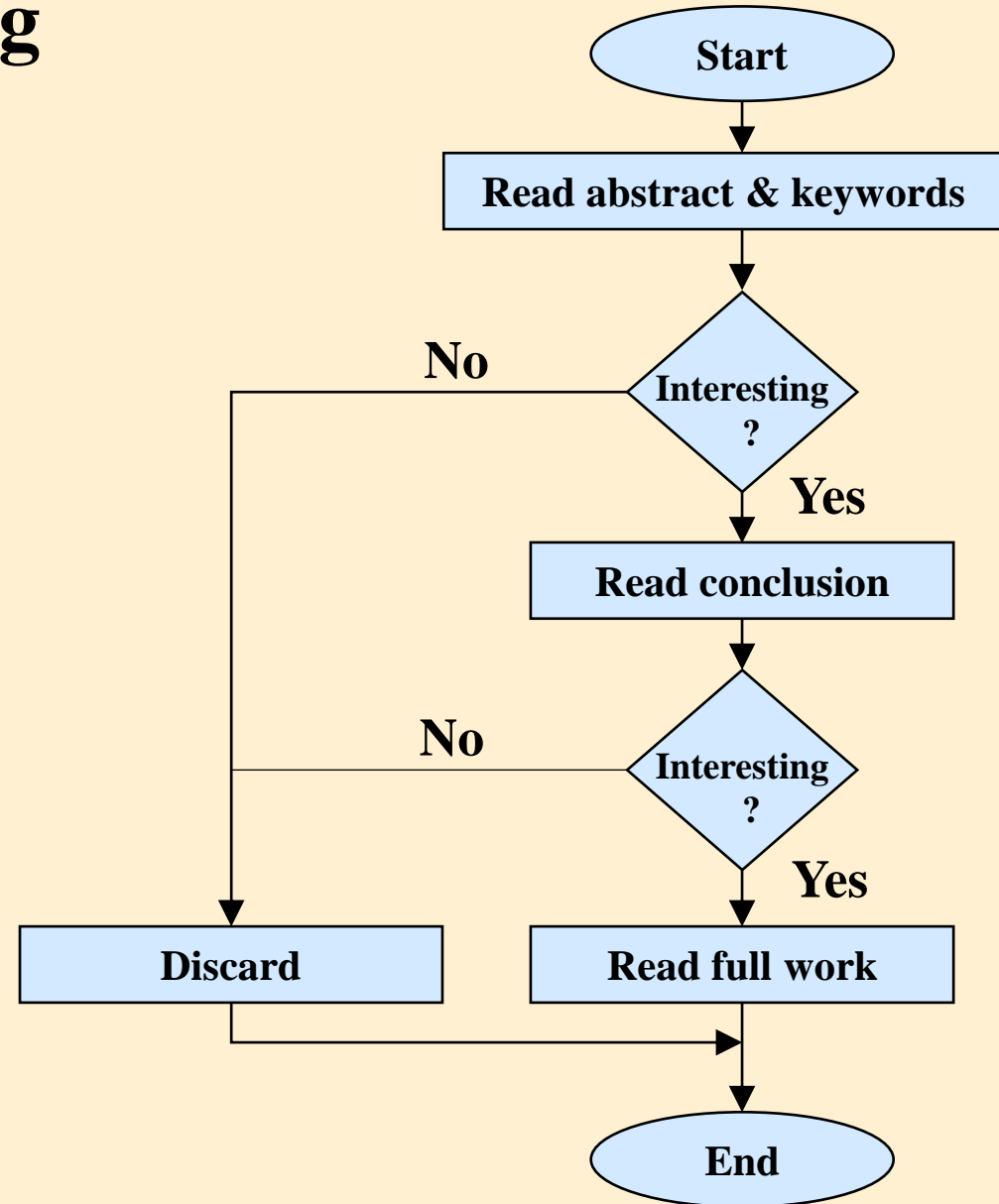




## II Basic skills: Selective reading

★ Do not read all work!

- ★ Start: Abstract & keywords
  - ★ If interesting: conclusion
  - ★ If interesting: full work
- ★ Not interesting = discard



## **II Basic skills: Authority control**

### **★ Different ways of writing names**

<b>Michel BAKNI</b>	<b>Michel B.</b>	<b>M. Bakni</b>	<b>Michel N. Bakni</b>
<b>Bakni, Michel</b>	<b>B. Michel</b>	<b>Michel Nicolas Bakni</b>	

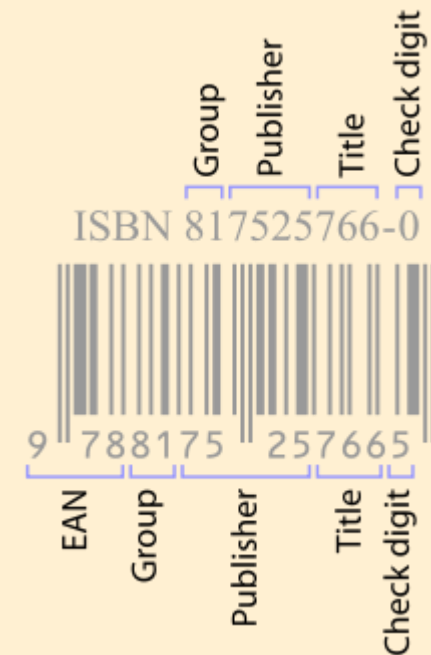
### **★ Different writing systems: Arabic & Chinese**

### **★ Same for names: books, institutions ...**

### **★ Solution: numerical & alphanumerical IDs**

## II Basic skills: Authority control - ISBN

- ★ International Standard Book Number
- ★ Uniquely identify book editions
- ★ Started: 1970 | International
- ★ International ISBN Agency
- ★ 13 number (including X=10) | (formerly 10)
- ★ Numbers has meanings



[Sakurambo CC-BY-SA 3.0]

## II Basic skills: Authority control – ISNI

★ **International Standard Name Identifier**

★ **Uniquely identify public Entities:**

◆ Names, publisher, journals ...

★ **Started: 2012 | ISNI-International Agency**

★ **16 number (including X=10)**

0000 0001 2146 438X



isni.org

## **II Basic skills: Authority control – VAIF**

**★ Virtual International Authority File**

**★ Uniquely identify people**

**★ Database: other control systems**

**★ Started: 2003 | Online Computer Library Center (OCLC)**

**★ Up to 16 random numbers**

106162365724425460032



viaf.org



# Basic skills: Authority control - ISSN

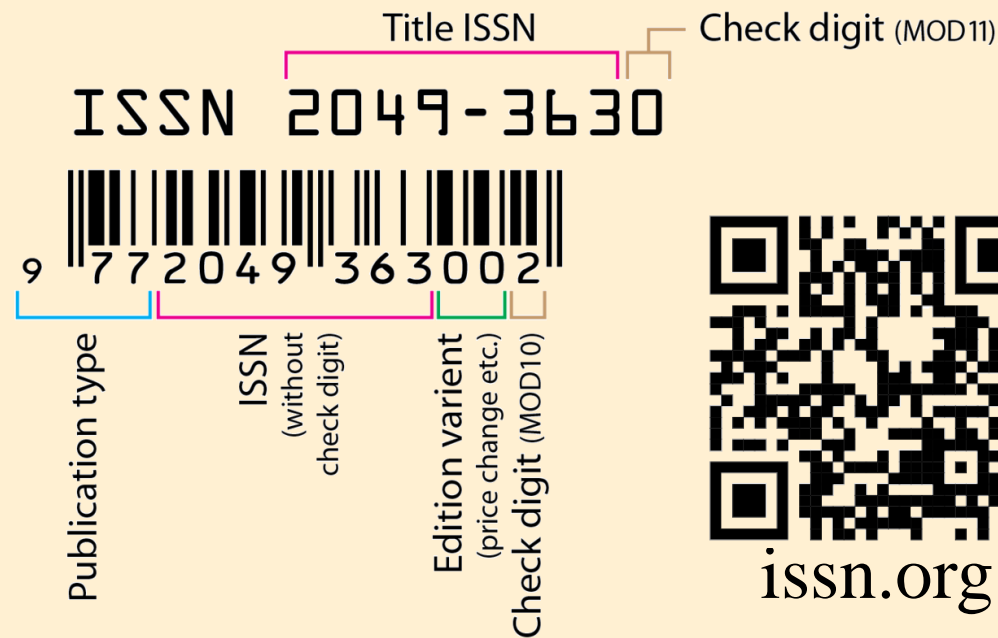
★ International Standard Serial Number

★ Uniquely identify serial publications

★ Started: 1976 | ISSN International Centre

★ 8 numbers

2049-3630



issn.org

[Petermorgan CC-BY 3.0]

## II Basic skills: Card System

- ★ Huge number of works
- ★ Avoid repeated searches
- ★ Today: completely automated
  - ◆ Reference management software
  - ◆ Mendeley, Referencer ... etc.
- ★ Well-organized
- ★ Old way: post-it cards

### Reference Card

#### Card ID

**Title:**  
**Author:**  
**Year:**                      **Publisher:**  
**ID:**                              **Place:**

### Quotation Card

#### Card ID

.....  
.....

**Page :**  
**Reference ID:**

## II Basic skills: Card System

“ Science, to put its warrant as concisely as possible, is the organized, systemic enterprise that gathers knowledge about the world and condenses the knowledge into testable laws and principles. ”

p. 53  
Consilience : the unity of knowledge  
Wilson, Edward O  
ISBN: 978-0-679-76867-8

### Reference Card

**R15**

**Title:** Consilience : the unity of know...

**Author:** Wilson, Edward O

**Year:** 1999

**ISBN:** 978-0-679-76867-8

### Quotation Card

**Q3**

Science, to put .....  
..... and principles.

**Page : 53**

**Reference ID: R15**



# III Searching for a problem

★ Starting: Scientific Search engine: google scholar

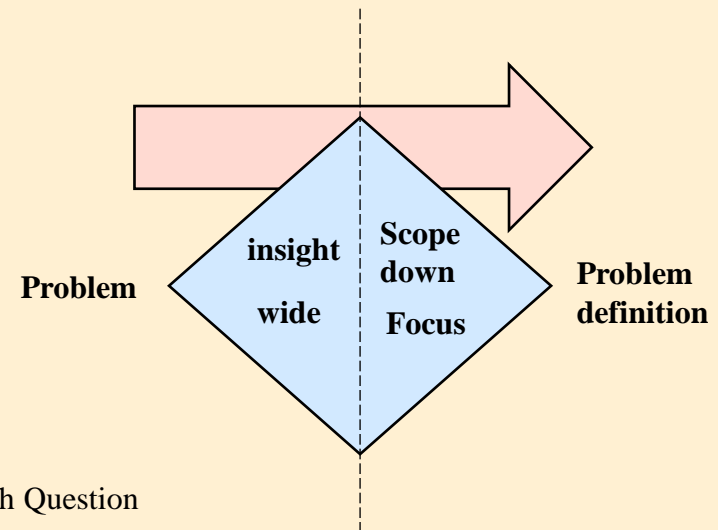
★ Selective reading & card system

★ Important sections:

- ★ Keywords (narrow research)

- ★ References (widen research)

★ Diamond model



## **III Searching for a problem**

### **★ Other ways to find research problem:**

- ◆ Research & development (R&D) department in your company
- ◆ Private or public research institution
- ◆ Expert researchers
- ◆ Conferences & publications

### **★ Write email: Clear & specified**

## **III Searching for a problem**

- ★ Be patient | fast & easy = problem in the defined problem**
- ★ Well-organized: effort & time management**
- ★ Read more & ask questions**
- ★ Communication: other researchers & experts**

## **IV Research problem properties**

**★ Responsibility: Researcher**

**★ Keep in mind several aspects:**

- ◆ Status of the problem
- ◆ Size of the problem
- ◆ Availability of tools & sources
- ◆ Studiabilty

# **IV Research problem properties**

## **★ Status of the problem**

- ◆ Still active?
  - ◆ Solution found
  - ◆ Some working on it!
  - ◆ Dead!
  - ◆ Open with no solution

## **★ Size of the problem**

- ◆ Well-defined
- ◆ Time available
- ◆ Cost
  - ◆ Materials
  - ◆ Travel

## **IV Research problem properties**

### **★ Availability of tools & sources**

- ★ Tools & Technology available
- ★ Available sources:
  - ✧ Cost?
  - ✧ Not classified

### **★ Studiabilty**

- ★ Safe to do it?
- ★ Help from others
- ★ Language needed
- ★ Natural point of view

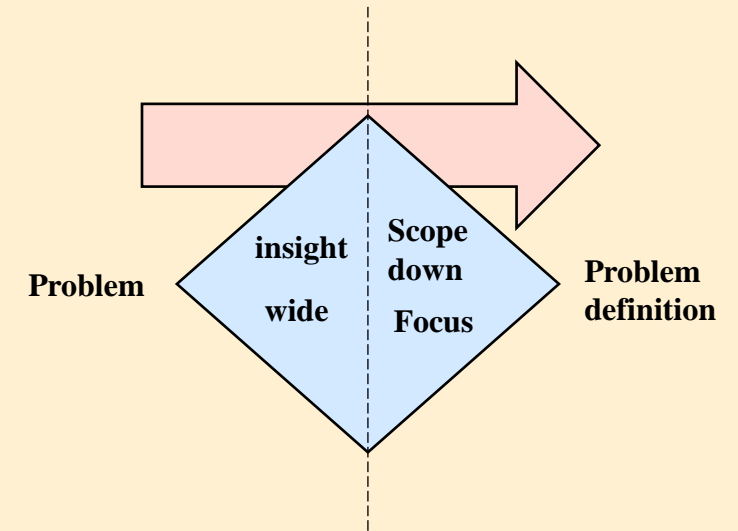
# **V** Notes on the research problem

★ **Defining problem: 1<sup>st</sup> Research step**

★ **Well organized & set of skills**

★ **Research = Go wide & focus: Diamond model**

★ **Properties & considerations Research problem**



**Course Title:** Scientific Method for Wikimedians

**Course Creator:** Michel BAKNI

**Video Title:** Research Question

**Film Editing :** Sandra HANBO

**Date:** March 2023



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