

# Research Proposal Development



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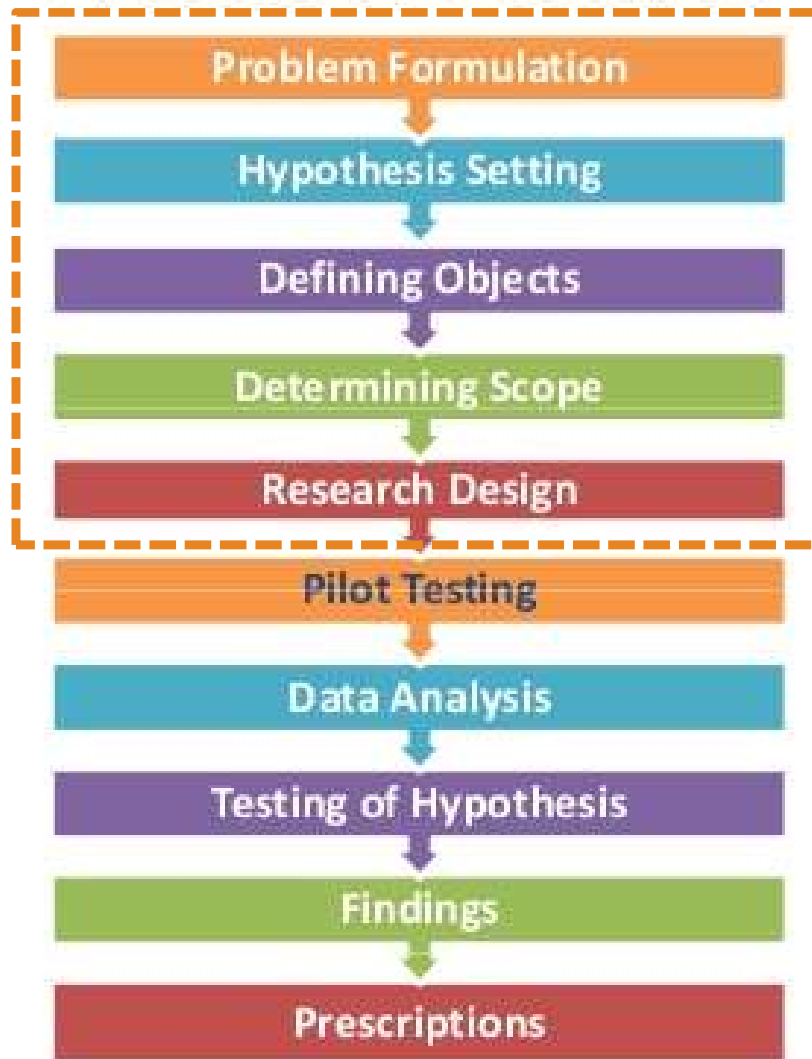
# Why do we need a proposal ?



- ⦿ Solicit advice and interest from your advisor
- ⦿ Establish a contract with a sponsor/advisor
- ⦿ Review creditability before committing resources

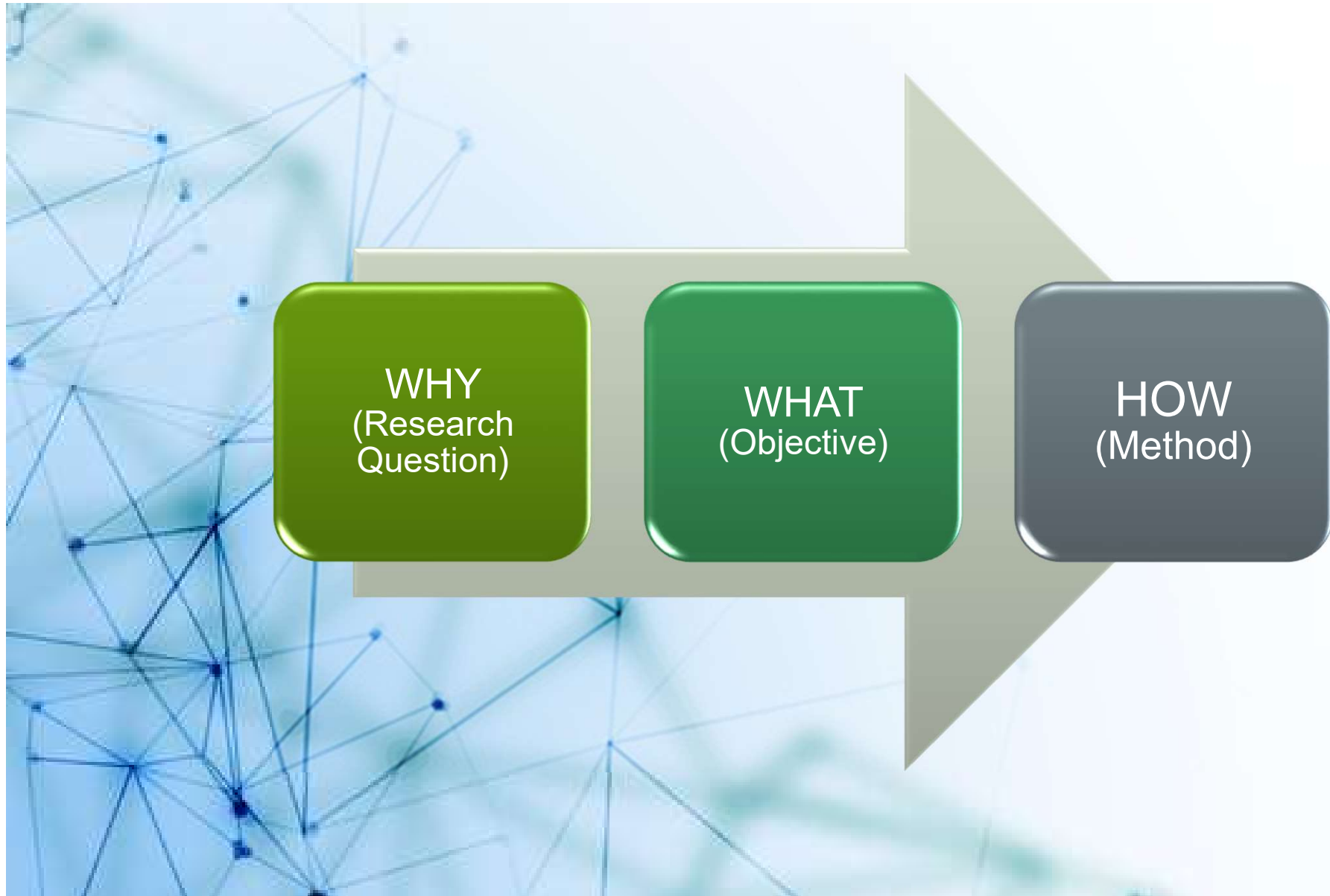
**More important issue >>> it's for your own benefit.  
 IT HELPS YOU THOROUGHLY THINK THROUGH A PROBLEM  
 BEFORE COMMITTING RESOURCES**

# Process of Research



# PROPOSAL DEVELOPMENT

# What's in a research proposal ?

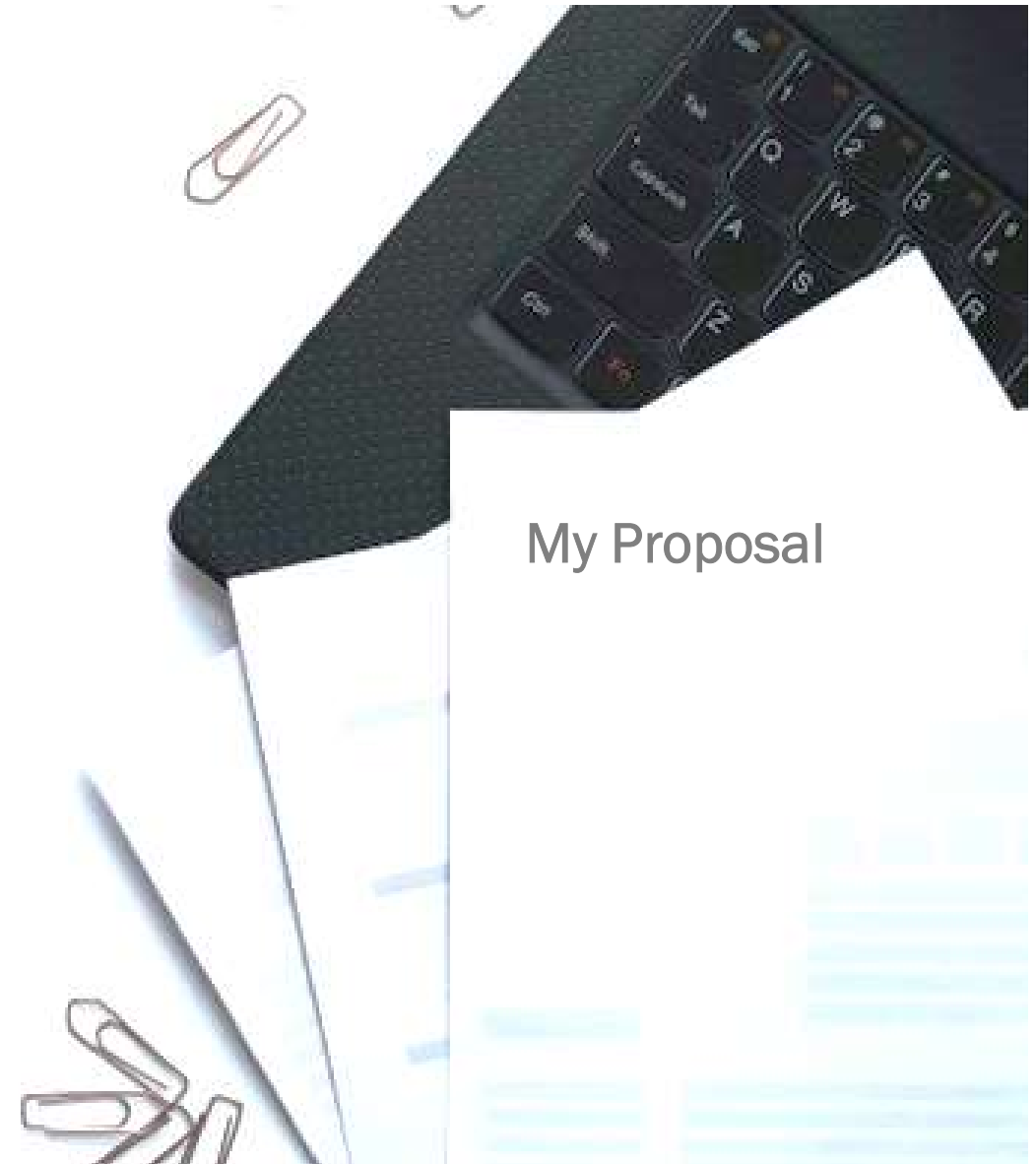


# Elements for a good proposal

- ◎ **A good idea** >> creative, flexible, and novel
- ◎ **A good story** >> clear, concise and organized
- ◎ **A technically correct presentation** >> mind your language
  
- ◎ attract attention of the readers.
- ◎ demonstrate your thorough understanding of the proposed project.

# Key Elements of Scientific Proposal

- ◎ Title
- ◎ Abstract
- ◎ Background (introduction)
- ◎ Objectives/purposes
- ◎ Hypothesis
- ◎ Methods
- ◎ Time frame
- ◎ Required resource
- ◎ Expected outcomes
- ◎ References

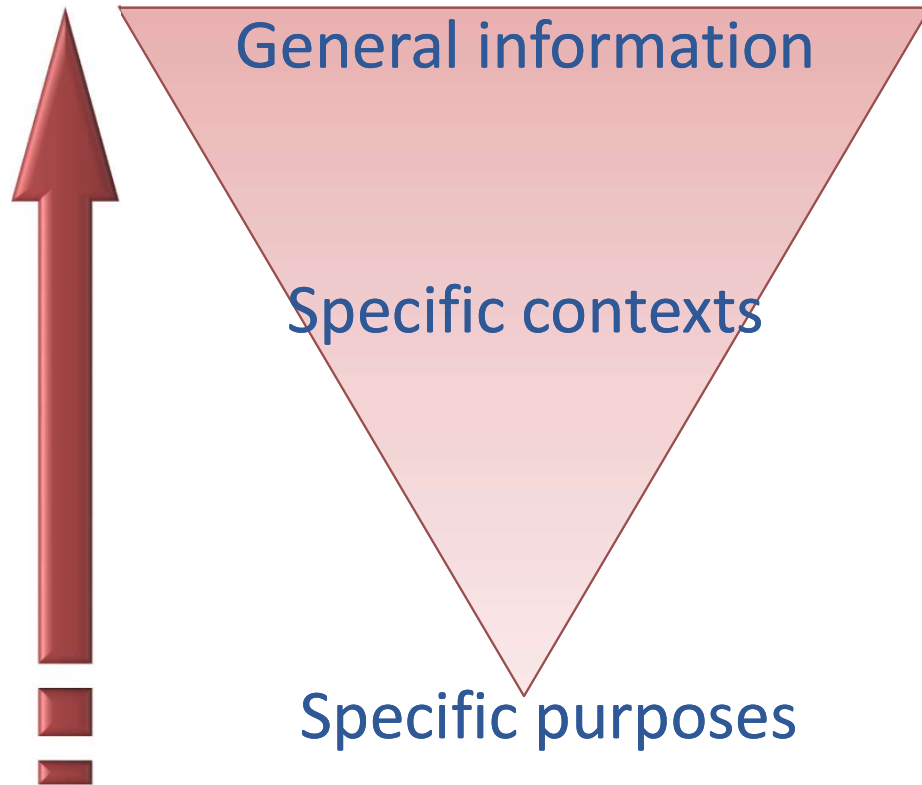


# Introduction

- To frame your research problem
- Background/ motivation/ literature review
- To demonstrate the relationship between the proposed research and what has already been done in the area
- Depend on your creativity, and ability to think clearly, and the depth of your understanding of problem areas
- Be focus and updated
- **Need strong impact that leads to the formulation of your hypothesis/objectives**

**NOT A REVIEW ARTICLE !**

# Introduction: LOGIC



Identifying the subject area of interest

To summarize what we knew about the specific problem, before you did the exp.  
 (No discussion please)

State the hypothesis or purpose of the study  
 State the rational of the study and what are the scientific merit of the study

# Objectives / Purpose

- Filling the need addressed in your introduction
- Non-quantitative but BE SPECIFIC and CLEAR
- If the purpose is not clear to the writer, it cannot be clear to the reader !!

## Hypothesis

- Statement of exactly what the research will explore
- **BE SPECIFIC and CLEAR**
- It's an idea, a concept....not a fact
- Hypotheses must be grounded in the theoretical framework.



## Enhancing Coronavirus Disease (COVID-19) Surveillance System through Information Technology, Thailand, 2020

Suphanat Wongsanuphat<sup>1</sup>, Siriwat Sangwanloy<sup>1</sup>, Prajak Sopha<sup>1</sup>, Woraphong Buangsuang<sup>1</sup>, Sataphat Denduang<sup>2</sup>, Aekachat Thongplean<sup>2</sup>, Voravit Payungkiatbawon<sup>2</sup>, Yongjua Laosiritaworn<sup>2</sup>, Sopon Iamsirithaworn<sup>3</sup>, Panithee Thammawijaya<sup>4</sup>

1 Division of Epidemiology, Department of Disease Control, Ministry of Public Health, Thailand

2 Information Technology Center, Department of Disease Control, Ministry of Public Health, Thailand

3 Division of General Communicable Disease, Department of Disease Control, Ministry of Public Health, Thailand

4 Division of Innovation and Research, Department of Disease Control, Ministry of Public Health, Thailand

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## Example: Enhancing Coronavirus Disease (COVID-19) Surveillance System through Information Technology, Thailand, 2020

Coronavirus disease (COVID-19) was designated as a dangerous communicable disease by law in Thailand. Several strategies and plans were initiated to mitigate the impact of the disease including specific disease surveillance system which had a direct impact on disease prevention, control, and specific policies implication....*Some info, on current set up...*

Subject area

However, the current information systems in Thailand could not accommodate symptoms, risk factors, cluster of cases data collecting systems, and laboratory reporting system  
....*Some detail in the gaps and challenges...*

Problem

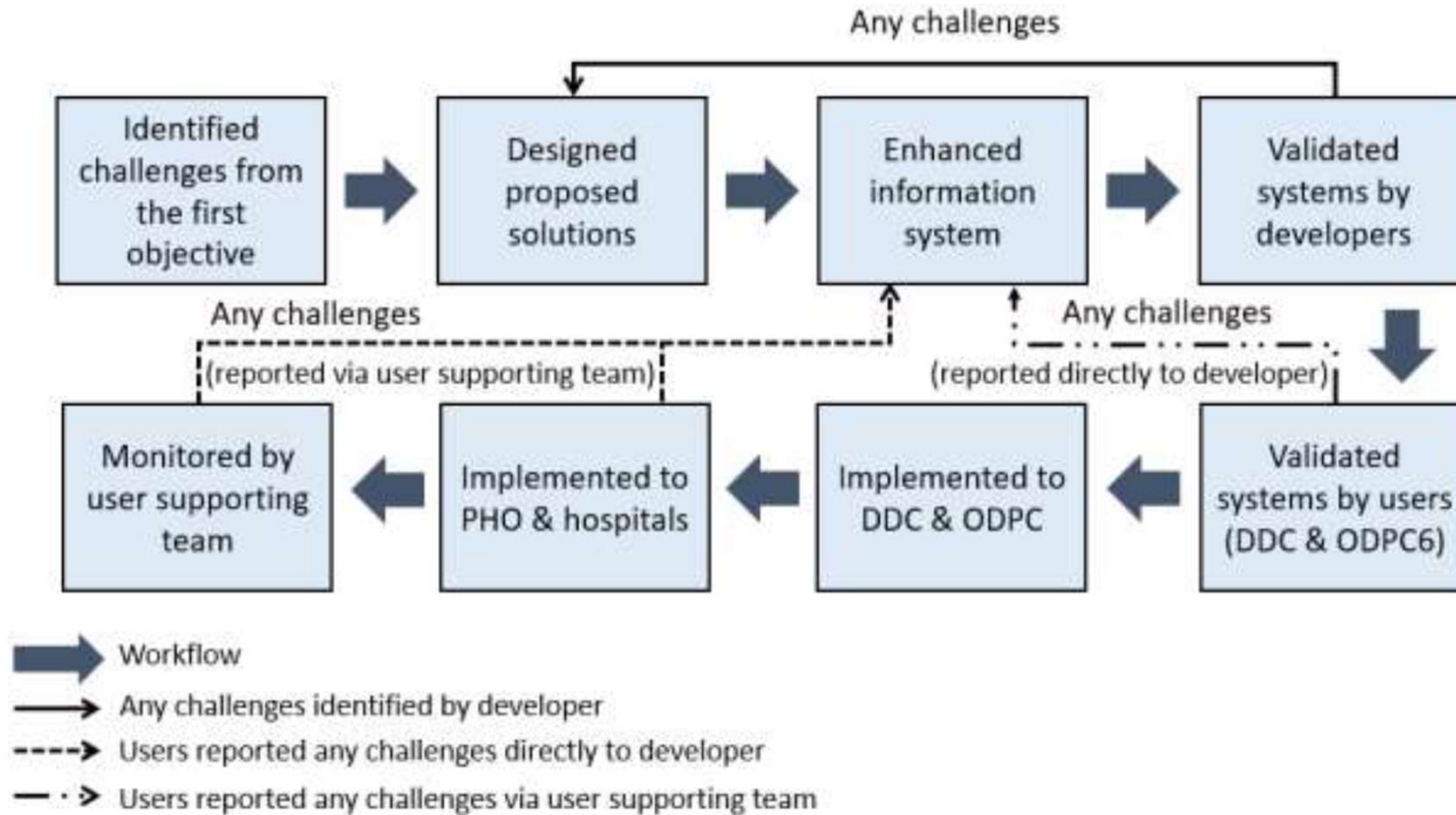
The research comprises two objectives; (i) to describe the existing surveillance system and its challenges, and (ii) to enhance surveillance system through the improvement of information technology.

Purposes

# Methodology

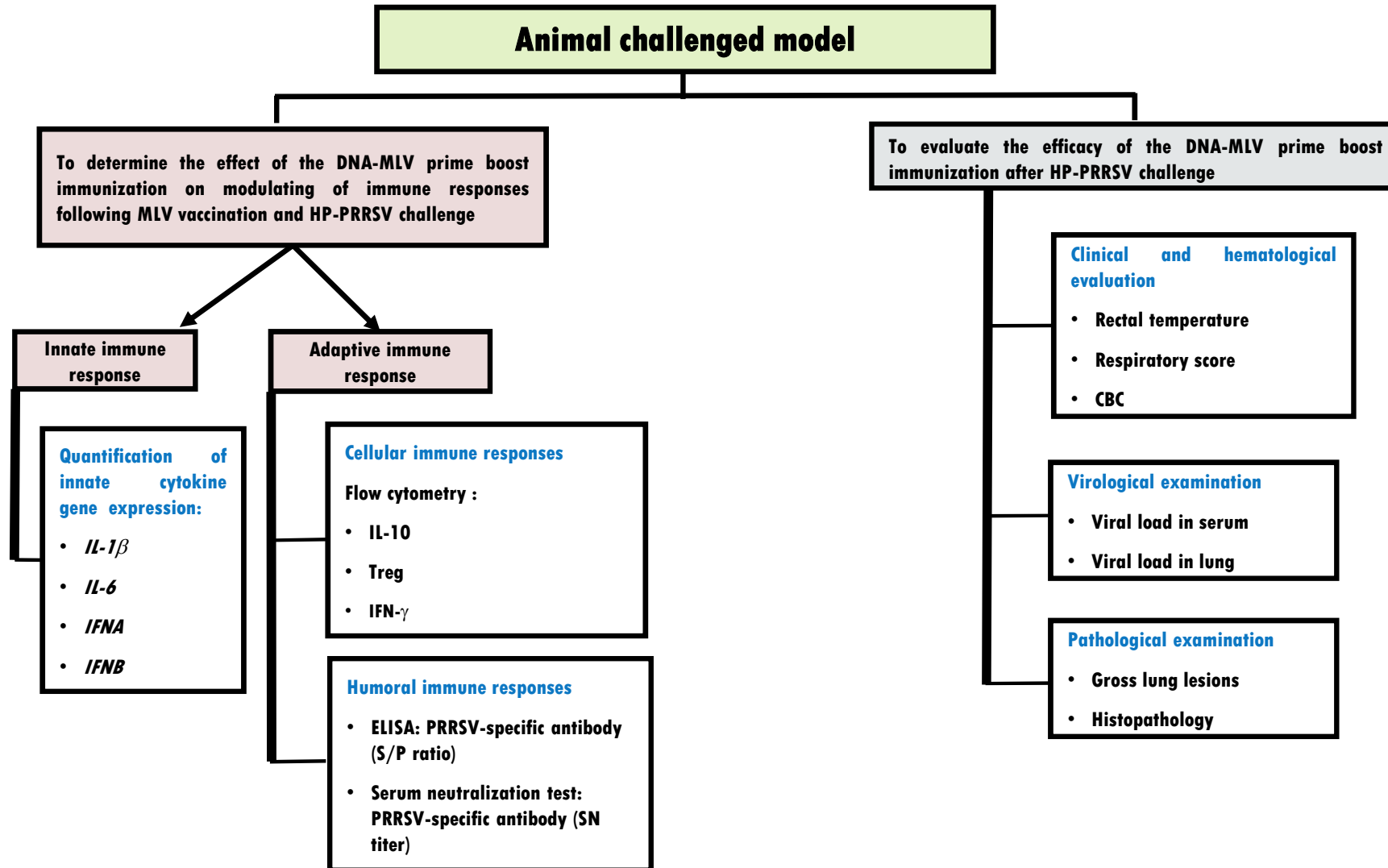
- ⦿ Not a lab manual !!!
- ⦿ Overview: Qualitative or Quantitative ?
- ⦿ Subjects or **sample sizes, inclusion/exclusion criteria**
- ⦿ Procedures
- ⦿ Instrumentation
- ⦿ Experimental design: **the controls**
- ⦿ Data analysis
  
- ⦿ **Illustration is very useful. (conceptual framework)**

# HOW...

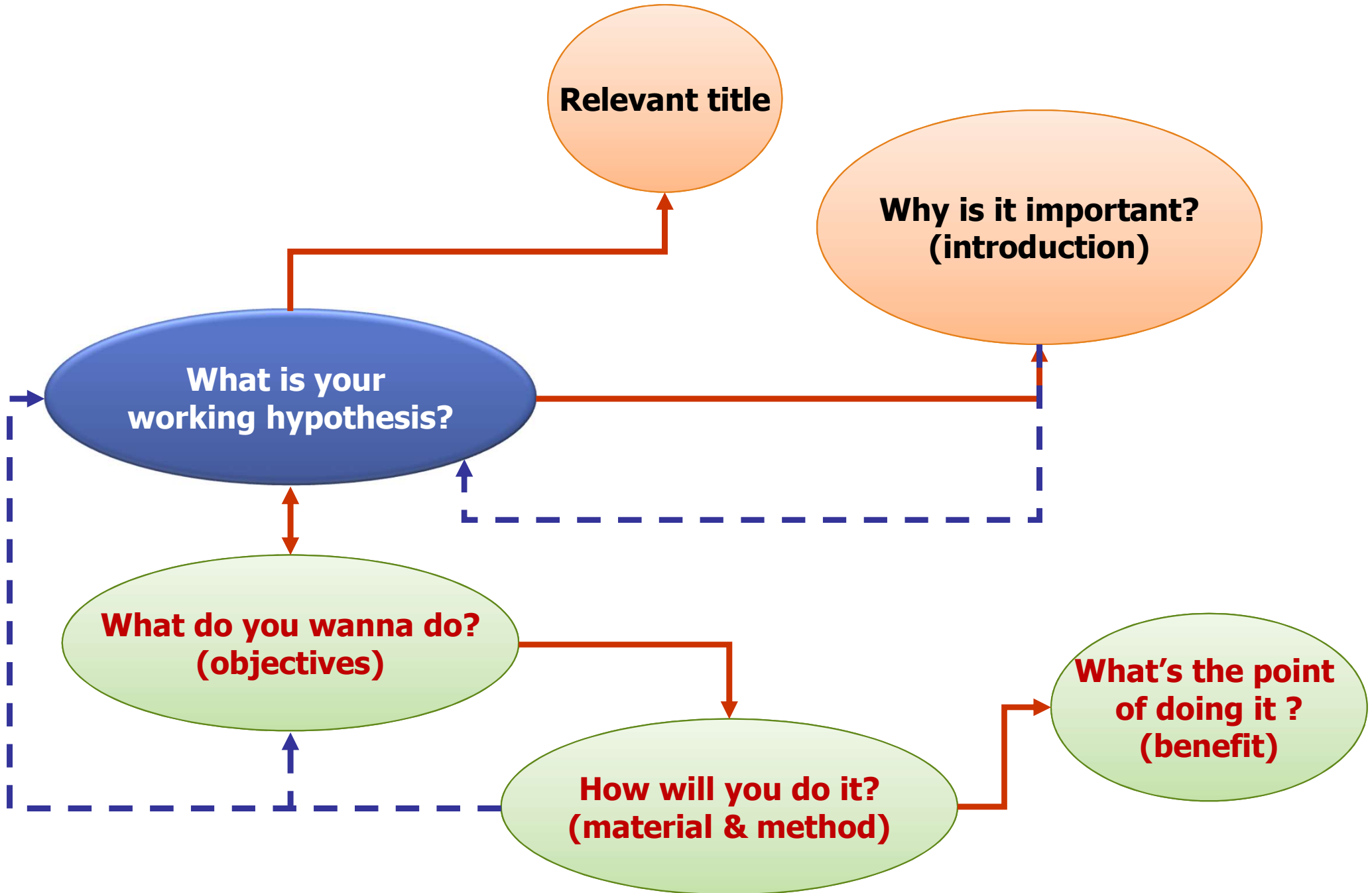


**Figure 1** Workflow with the challenges identification process, redesigning process and modification process of the information system

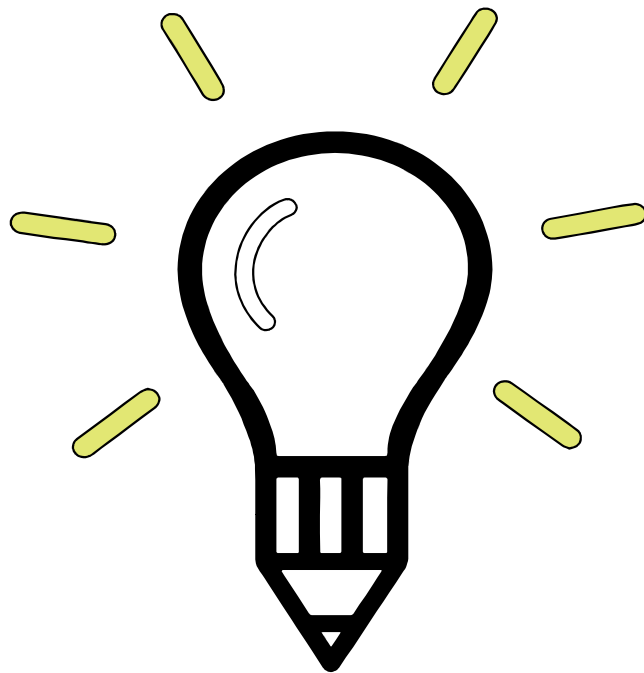
# Experimental design



# Here's the hint...mind mapping



# Idea concepts



**01** FOCUS: key ideas

**02** Pre-proposal: why, what

**03** Proposal: why, what, how

**04** Publication: why, what, how, result, so what?

# What's really in my mind ?

- ◎ Title ...first impression
- ◎ Abstract...is it worth to read further ?
- ◎ Background (introduction)... why you are doing it ?
- ◎ Objectives/purposes ...will these answer your research questions?
- ◎ Hypothesis ...can you think of what exactly will you explore ?
- ◎ Methods ...how your are going to answer the research question in a logical way ?
- ◎ Time frame ...doable in your study period ?
- ◎ Required resource
- ◎ Expected outcomes ...does it make any sense ?
- ◎ References ...how sloppy you are !

# Choosing tense

## Past tense

- ⦿ **Work done**
  - We collected blood samples from . . .
  - Groves et al. determined the growth rate of . . .
  - ..
  - Consequently, astronomers decided to rename
- ⦿ **Work reported**
  - Jankowsky reported a similar growth rate . . .
  - In 2009, Chu published an alternative method to . . .
  - Irarrázaval observed the opposite behavior in . .
- ⦿ **Observations**
  - The mice in Group A developed, on average, twice as much . . .
  - The number of defects increased sharply . . .
  - The conversion rate was close to 95% . . .

## Present tense

- ⦿ **General truths**
  - Microbes in the human gut have a profound influence on . . .
  - The Reynolds number provides a measure of . . .
  - Smoking increases the risk of coronary heart disease
- ⦿ **A temporal facts**
  - This paper presents the results of . . .
  - Section 3.1 explains the difference between . .
  - Behbood's 1969 paper provides a framework for . .
  - ..

## Future tense

- ⦿ **Perspectives**
  - In a follow-up experiment, we will study the role of . . .
  - The influence of temperature will be the object of future research . . .

# Common mistakes



# A reviewed article / wanderer

@\$KFR is a new disease found in newborn sea turtles. The disease is caused by @\$KFR virus that belongs to the family, braaa, braa, braa, the genome consists of braa braa braa (3 pages), pathogenesis of the disease is unknown, but may involve the *mad*, *sad*, and *bad* genes braaaaaaaaaaaaa zzzzzz another 5 pages.

Q: Does the disease exist in Thai turtle ?

FAKE

# Study design does not answer research question.

- ⦿ **Hypothesis:**

Thailand Covid-19 surveillance system can be improved through information technology

- ⦿ **Objectives:**

(i) to describe the existing surveillance system and its challenges

(ii) to enhance surveillance system through the improvement of information technology.

- ⦿ **Method:**

- To conduct outbreak investigation on Covid-19 outbreak in Bangkok.
- To improve WIFI access at the hospitals

**FAKE**

# A lab manual

- ⦿ A research proposal copied from lab. SOP.
  - 2 pg Introduction & background
  - 15 pg. Lab protocols .....zzzzz
  - **So, you think that the reviewers will do your work ?**
  
- ⦿ A proposal copied from senior students'

**....A BIG MISTAKE**

# Sloppy proposal/wrong assumption

- ⦿ Poor writing/reviewing >> cut/paste of the abstracts
- ⦿ Too looooooong and booooooring introduction
- ⦿ Typo errors
- ⦿ Inconsistent reference format
- ⦿ Last minute writing
- ⦿ Reference/citation issues

# Watch the format and deadline !



# Other tips

- ◎ Write for an extended period of time
- ◎ Take your time: once you finish the first draft, leave it for a while. When come back, look for
  - Flaws in logic/sequence
  - Misquoted or misremembered facts
  - Excess verbiage
- ◎ Always polish your paper

# Key summary on research proposal

