



# ● Research Methodology

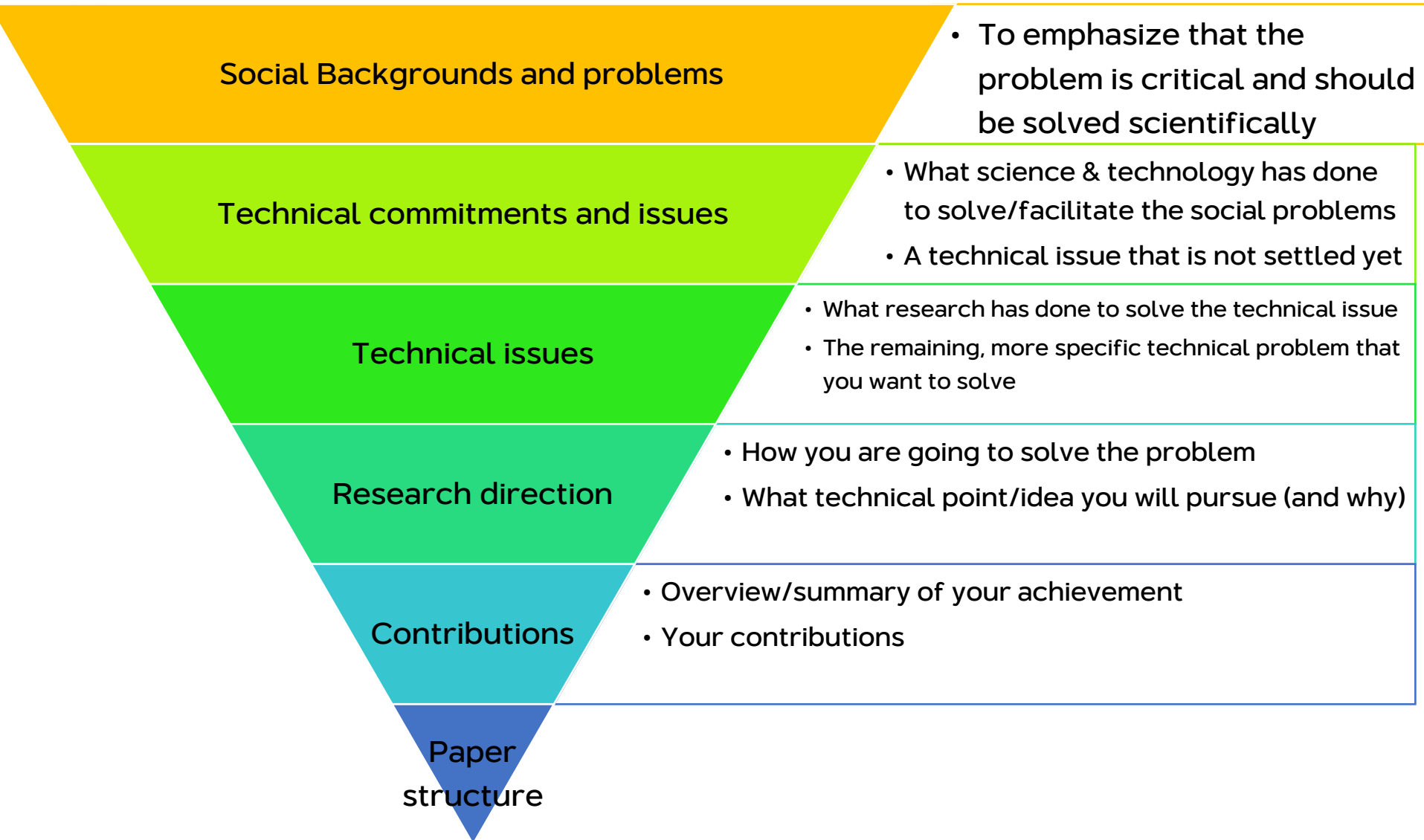
#2 & #3

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- Each research study must have its own story.
  - Even the best of the best achievement may not be well appreciated if out of context
  - On the other hand, even just an application of an existing technology is highly appreciated if everyone understands such an application is really new.

- In every bit of your research decisions, you need a sound reason for your decision.
  - Exceptions:
    - Choice of programming language (anyway, all existing programming language is Turing machine-compatible 555)
    - Choice of PC (the performance of a particular PC can be measured if you write its specification)
- 'Reason' is not an 'excuse'!
  - NG: Because my instructor says ....
  - NG: Because the data is at my hand ....
  - NG: Because this is what I know/what I'm good at ....
- Even if the truth is something else, you must devise a well-persuasive reason for everything bit of your research. If you cannot, your research will not be well counted.

# PSU Story Framework (=Structure of Introduction)



# PSU • What is 'good' topic?

- (Here in my talk, 'theme' is a bigger concept (like a subfield) than 'topic', though others may think opposite)
- Anything can be a good research topic.
  - However, if you go on a wrong track, any (potentially good) research topic will be a mere implementation or below academic research.
- A good topic must be thought to produce 'new' finding, be it a theoretical one or a practical wisdom.
  - Of course, these 'new' things must be able to objectively judged.
  - 'Theme' itself is not a 'topic.' Students often pick up too broader a theme as their topic. So, "Be specific enough" is really important, but you can start from a broader theme, and then narrowing yourself into more specific during your research.

# PSU • 4 Levels of Sound (or healthy) thinking

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- Logical Thinking
- Critical Thinking
- Design Thinking
- Agile Thinking

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- Design...Types of study decides what is needed and focused
- Positioning...Where your research is located in the body of the related research field, and where your research is located in a more broader context
- Planning...PDCA (Plan-Do-Check-Act)

## ➤ A research design is a systematic plan to study a scientific problem.

- The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan. (From Wikipedia)

## ➤ Positioning make clear the status of your research

- Narrowly, your research must be properly located in the context of the research field. ← That's why literature survey is so important.
- Broadly, you should properly located your research in the social / academic needs. ← That's why your story organization is so important.

## ➤ Planning

- Your life is too short for any research; you need an appropriate plan/schedule.



- The truth
  - Almost every time, your research starts from a mere curiosity, from your personal desire (I want to graduate! 555), or from advice of your instructor.
  - Your research is restricted by many realistic foolish conditions (like shortage of money 555)
  - Decisions during your research are often accidental.
  - Your research is just grounded on a particular case
- However, your research paper (=outcome) must describe your research as
  - Needed
  - Important
  - Essential
  - Exhaustive (in considering options)
  - Necessitated (in every choice and decision)
  - Universal