

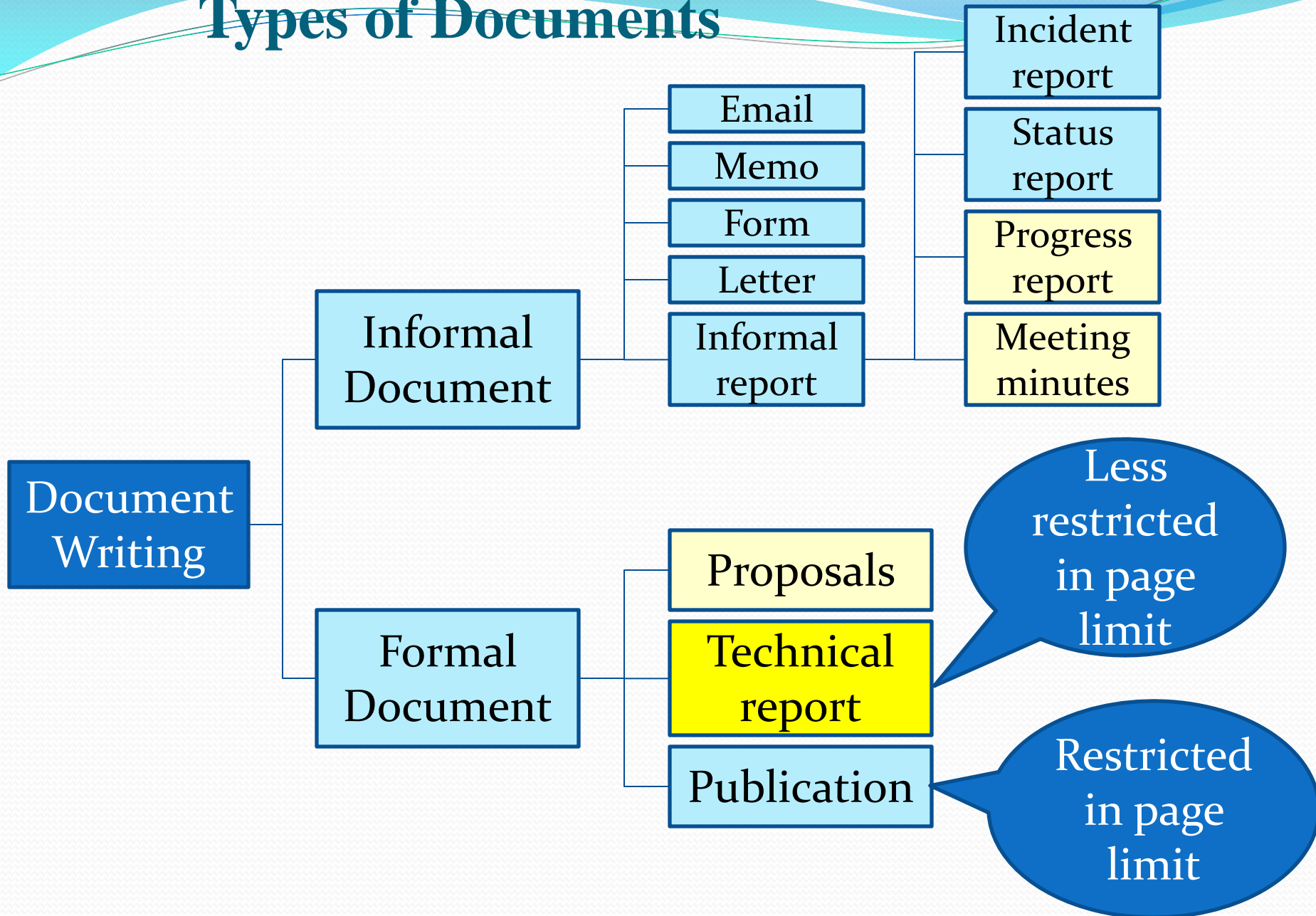
Technical Report Writing and Evaluation

with CSE 593 Final Report Requirement

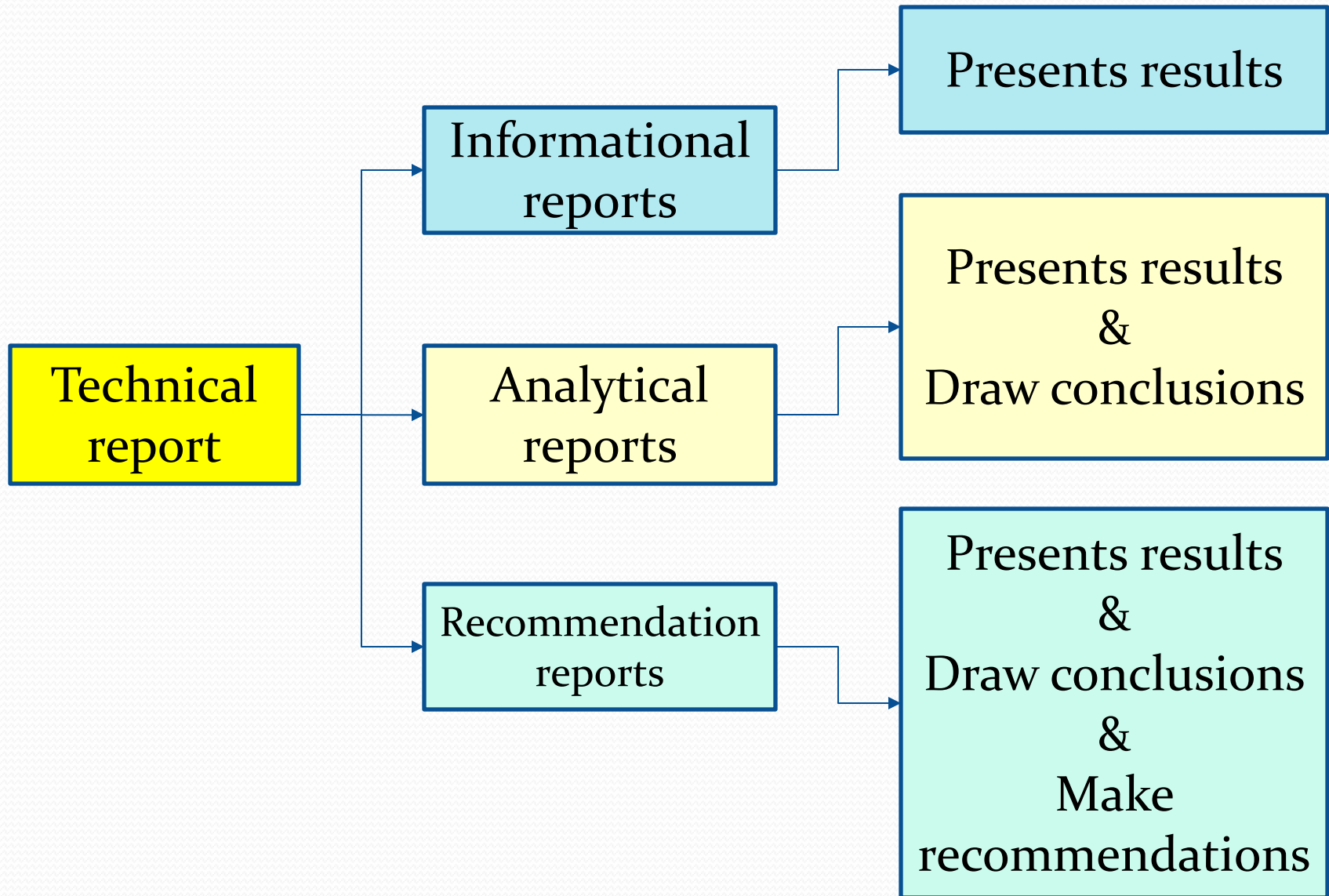


Dr. Yinong Chen

Types of Documents



Types of Technical Reports



Informational Report

An informational report presents **facts or results** discovered to help readers understand the current situation. It often addresses the following issues

- What are the goals and objectives of the project?
- What are the functions developed or to be developed?
- What are the most popular ways of implementing the functions?
- How are the functions in this project implemented?
- What is the status of the project if further development is needed?
- What are the plan and the vision of the end system?
- What are the impact of the system?

Analytical Report

Like an informational report, an analytical report provides facts or results. Furthermore, the report **analyzes and interprets** the results, and draw conclusions based on the theoretical analyses. It often addresses the following issues

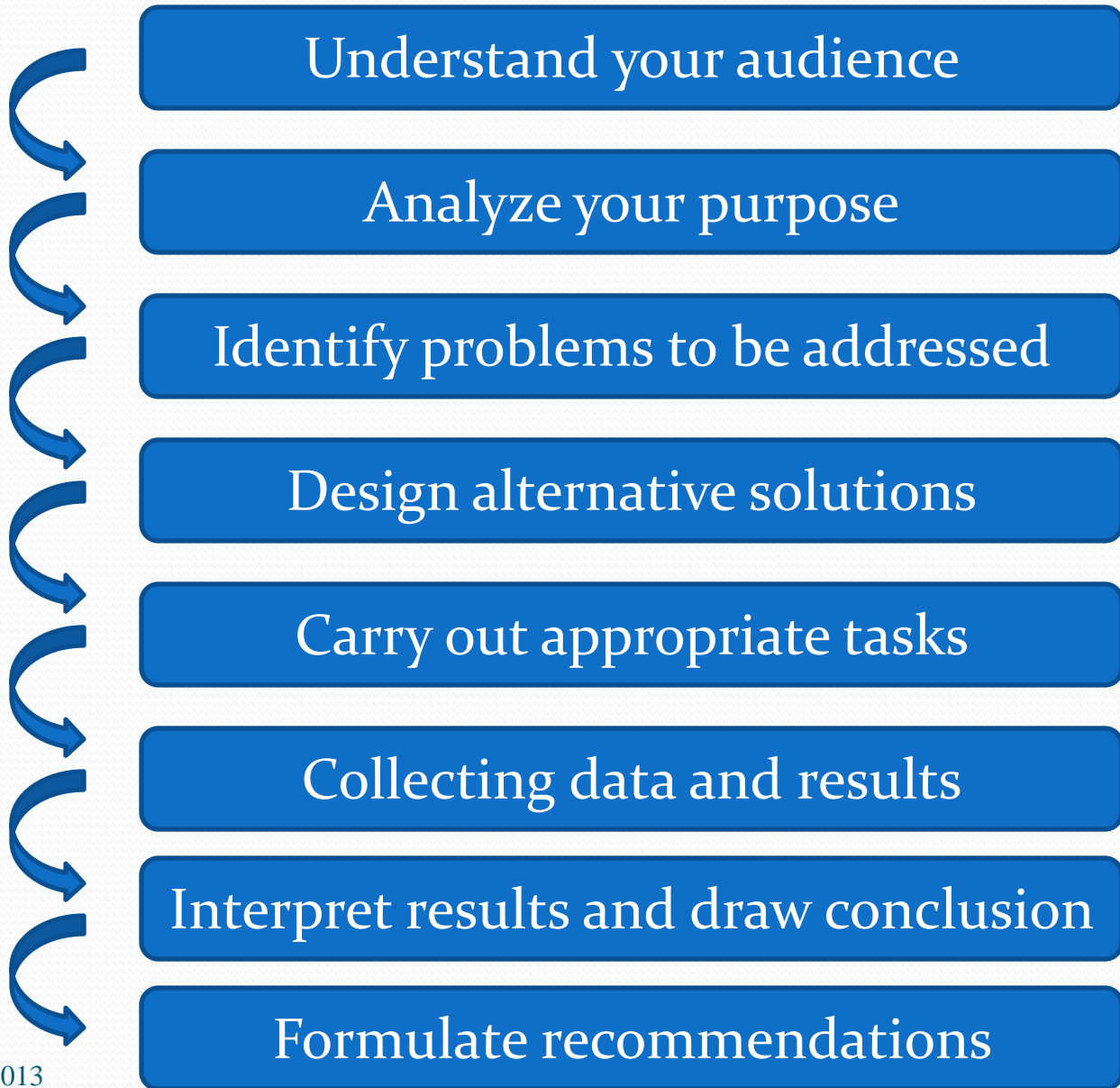
- What are the alternative solutions and their advantages and drawbacks?
- What are the best ways of implementing the functions in terms of performance?
- What are the best ways of implementing the functions in terms of dependability?
- What are the most cost-effective ways?
- What are the ethical impacts of the system?

Recommendation Report

A recommendation report will **validate the analytical results before making a recommendation**. It often addresses the following issues

- Present the experimental and testing results.
- Do the results support the analytical results?
- If they do, validate if all constraints and conditions in both environments are identical.
- If they do not, identify the where the problems are and how can the problems be addressed.
- Feasibility study of implementing the system in an engineering environment
- Business and financial consideration

Problem-Solving Model for Writing Report



Introduction

- What is the subject of the report?
- What is the purpose of the report?
- What is the background of the report?
- What is the scope of the report?
- What are the most significant findings?
- What are your recommendations (summary)?
- What is the organization of the report? Use one or two sentences to describe each main section of the report.

Related Work

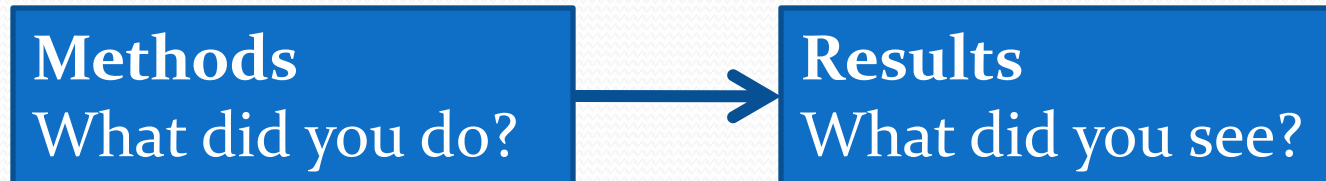
- What are the significant work that has been done in the domain and why do you still need to do the work?
- Discuss each piece of the work and compare and contrast with your work.
- What are the strength of your work which makes it competitive?
- You need a balanced partition between the introduction and the related work sections.
- You need to have a fair summary of other people's work.

Methods: Design and Implementation

- This section answers this question “What did you do to solve the problem?”
- You need to consider the readers’ knowledge of the field, the interests, and reasons of reading the report;
- You need to provide sufficient information for the readers to understand what you did and why you did it that way;
- If you want others to repeat your methods, you should include sufficient detail.

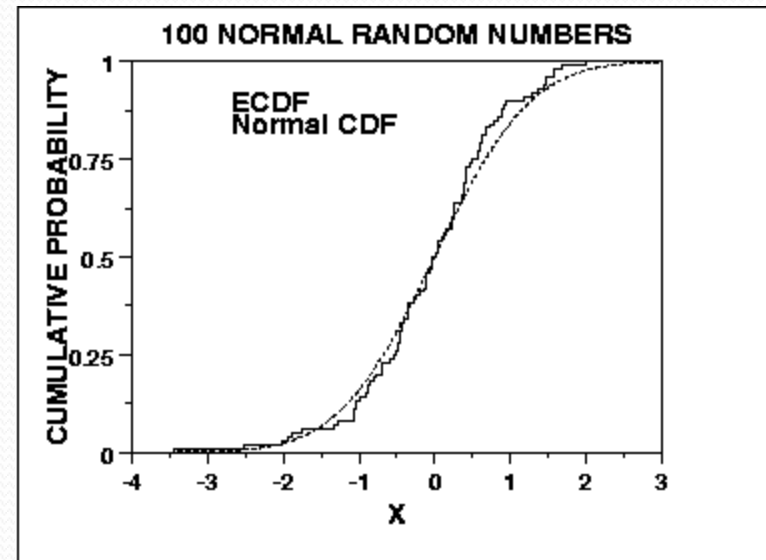
Results Part in the “Evaluation Section”

- This section answers this question “What did you see?”
- Results are the data that you discovered or compiled.
- Present the data objectively, without comments.
- Clearly separate your interpretation of results and conclusion derived from the results.
- You need to choose right method to present the data, e.g., using charts, tables, etc.



Interpretation Part in the “Evaluation Section”

- This section answers this question
“What does it mean?”
- Do the data unveil certain trends or laws?
- Can the trends be extended to the scope beyond the data range experimented?
- Chi-Square Goodness-of-Fit Test



Methods
What did you do?

Results
What did you see?

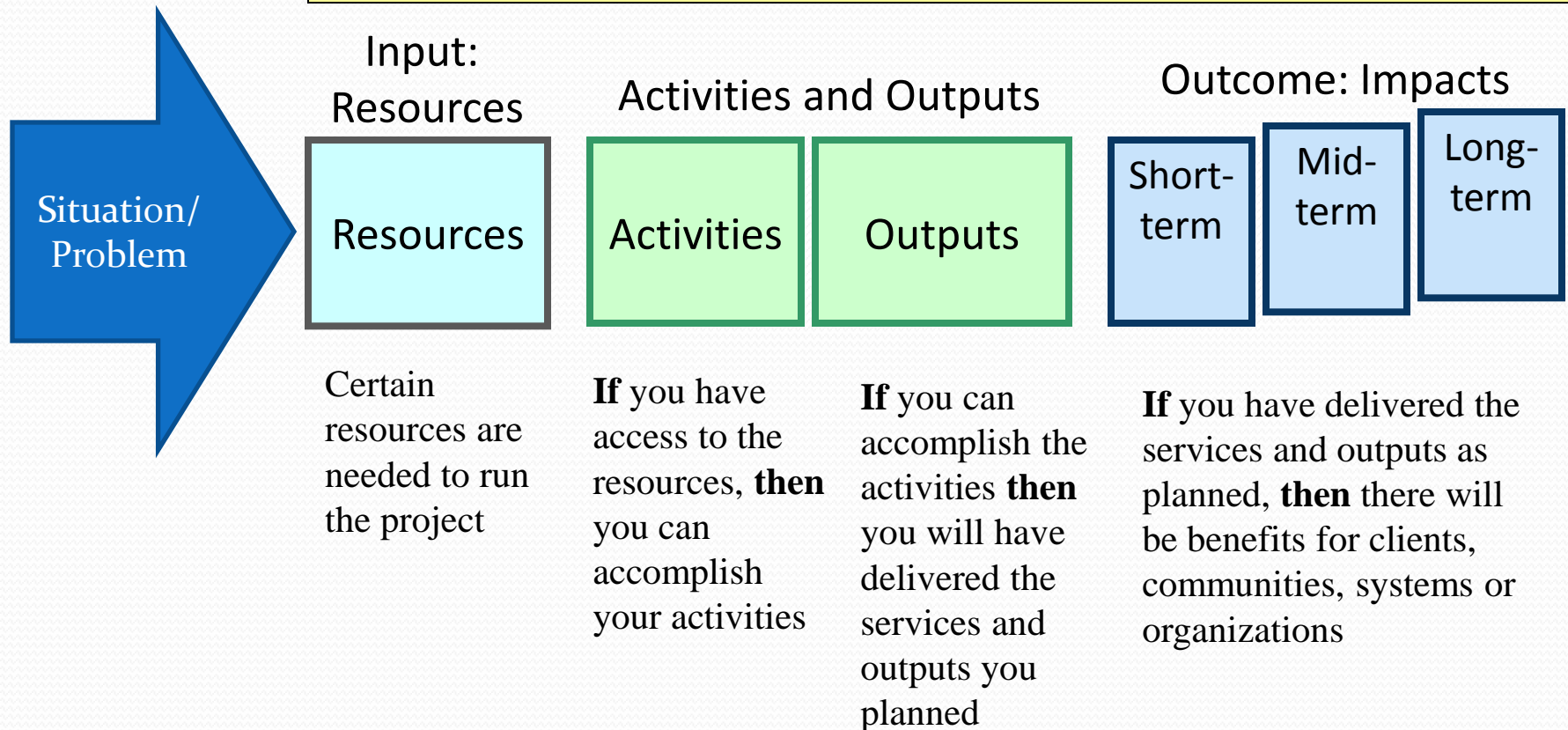
Interpretation
What does it mean?

Project Evaluation in Logic Model

- The **logic model** is a conceptual model;
- It is a tool used for describing the **performance** and **effectiveness** of projects, in terms of **resource** and **outcome** ratio;
- The model describes logical linkages among project **resources**, **activities**, **outputs**, and **outcomes** related to a specific problem or situation;
- Once a program has been described in terms of the logic model, critical measures of performance can be identified.

Block Diagram of the Logic Model

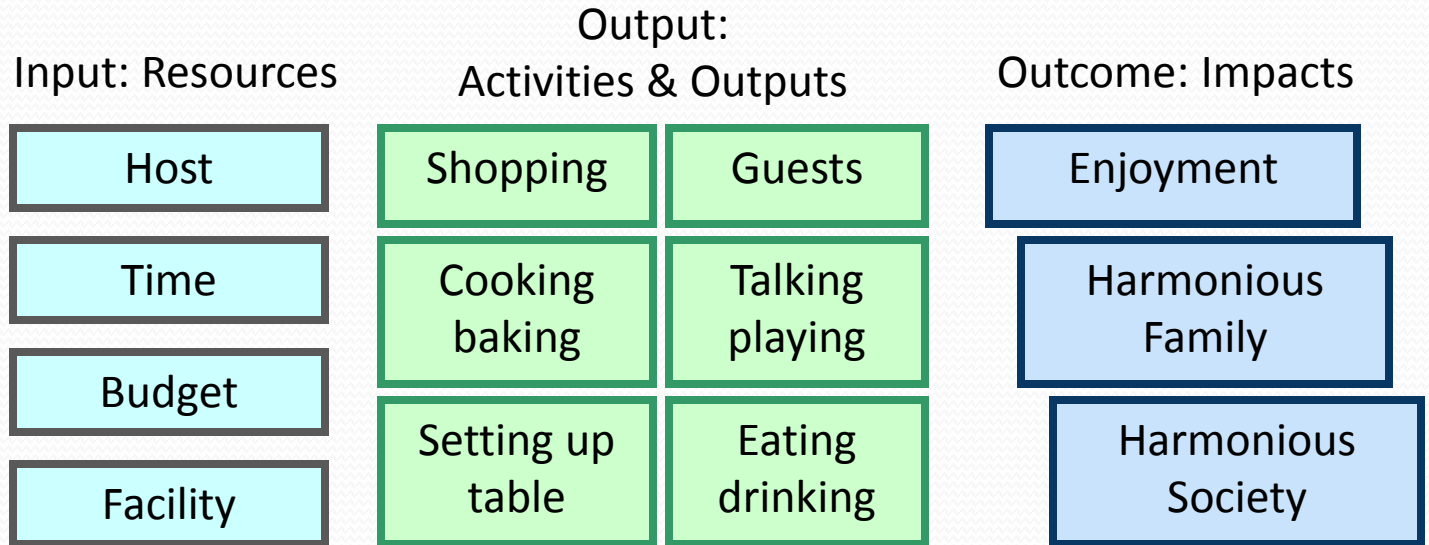
Project Goal: To address the situation and solve the problem



Example: Logic Model of Thanksgiving Dinner

Project Goal: Celebration of Family Reunion

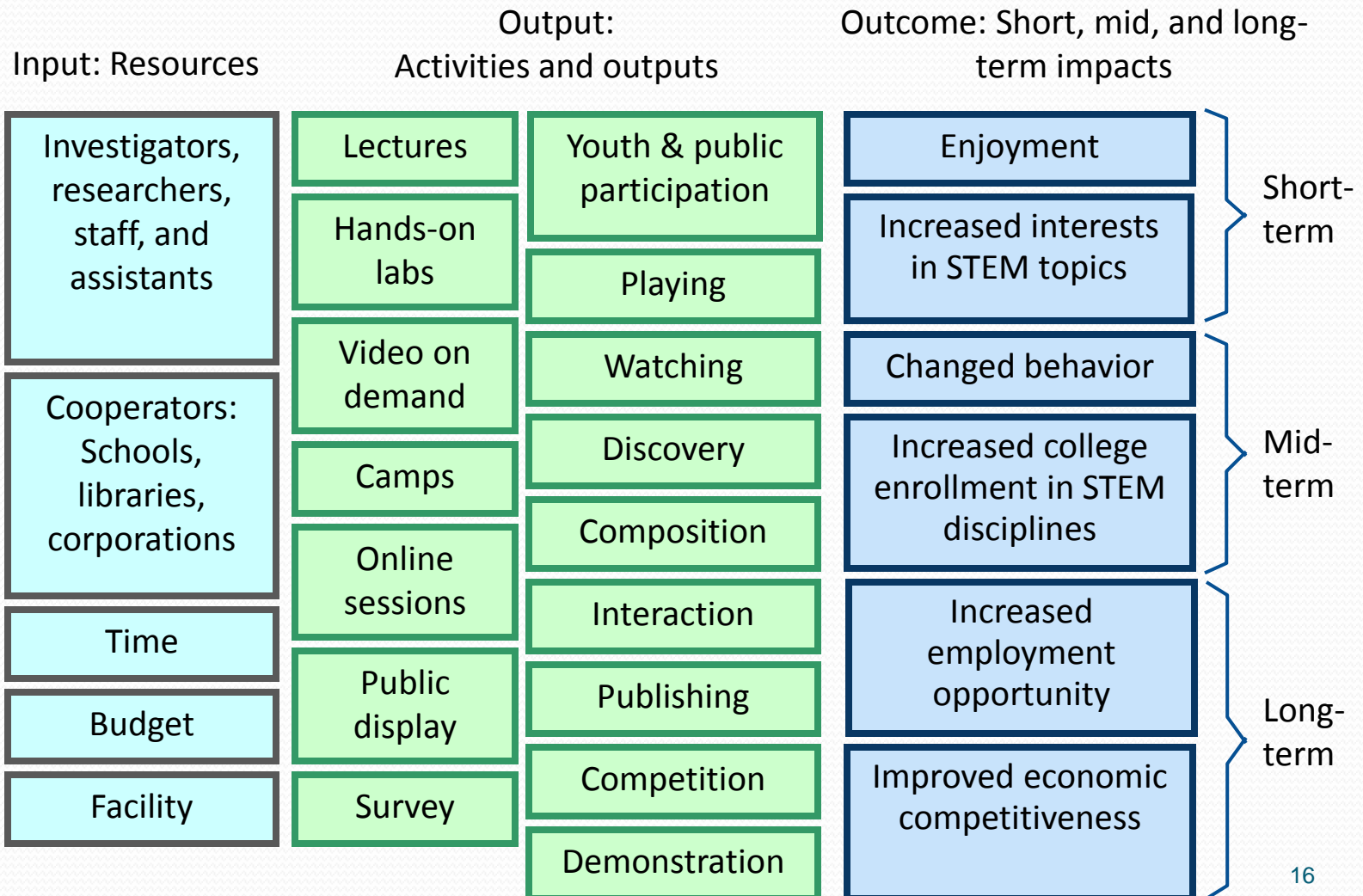
Situation:
Family
members have
been busy with
their
commitments



Logic Model for Informal Education

Project Goal: A platform for increasing STEM interests in an informal environment

Situation:
Fewer students are interested in Science, Technology, Engineering, and Mathematics -- STEM



Evaluation of Project Effectiveness

Input: Resources

PIs, researchers,
staff, and
assistants

Cooperators:
Schools, libraries,
corporations

Time

Budget

Facility

What amount
of money and
time were
invested?

Activities and Outputs

Lectures

Hands-on labs

Video on
demand

Camps

Online
sessions

Public display

Survey

Were all
sessions
delivered?
In what
periods?
How
effectively?

Youth & public

Attending

Playing

Watching

Discovery

Composition

Interaction

Publishing

Competition

Demonstration

How many youths have
participated?
Did they attend all
sessions?
Did they meet
expectation?

Outcome: Impacts

Enjoyment

Improved knowledge in
STEM topics

Changed behavior

Increased college
enrollment in STEM
disciplines

Increased employment
opportunity

Improved economic
competitiveness

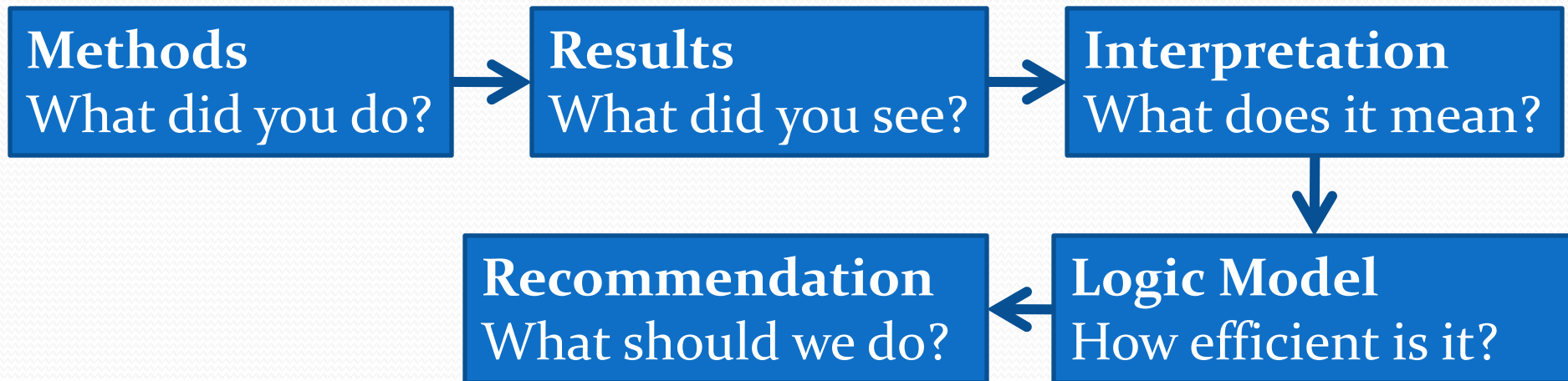
To what extent did
knowledge and skills
increase? For whom?
Why? What else
happened?

To what extent did
behaviors
Change and enrollment
increased? For whom?
Why?

To what extent are
relations
improved? Does
this result in
increased
opportunity and
competitiveness?

Recommendation Part in the “Evaluation Section”

- This part answers this question “What should we do?”
- A recommendation need to be made based on the results, interpretation, and OTHER factors.
- Validation of results and interpretation.
- Feasibility in terms of business and financial consideration.



Proposal and Final Report

Proposal

- Abstract/Summary
- Introduction
- Related work
- Design, alternatives, and deliverables
- Planning and management
- Conclusion and Summary

Final Report

- Abstract/Summary
- Introduction
- Related work
- Design, alternatives
- Final Implementation
- Modeling, simulation, analysis
- Testing, quantitative evaluation, results interpretation, and ethical implications
- Conclusion and Summary

Other Parts of the Proposal

- **List of references** cited in the main proposal. It should include
 - Books and textbooks where fundamental issues of the related research are discussed, e.g., CSE598 textbook;
 - Traditional research references such as journal and conference articles are preferred. These references have a permanent existence.
 - Limited number of Web references are acceptable. Those references can disappear, and use only if necessary. You must show the date of retrieval.
- **Professional biographies** of investigators, one to two pages, list the experiences, particularly those that are related to the project.
- **Other supporting documents** that can help the review to understand particular issues in the proposal.
- **Acknowledgement**: List helps received and list percentage of contributions from each member if team work is involved.

CSE593 Final Report Outline

- Proposal Contents (Total number of page should be between 20 and 30)
 - Title page
 - Table of contents
 - Summary (1 page)
 - Introduction (2 pages)
 - Related work (2 pages)
 - Alternative designs, methodology, and approaches. (2 pages)
 - Final implementation details (5 – 6 pages)
 - Modeling, simulation, and analysis, testing, quantitative evaluation, results interpretation, and ethical implications (5 – 6 pages)
 - Logic model or Monte Carlo Model
 - Performance/Cost/Dependability
 - Ethics
 - Conclusion and summary
 - Acknowledgement
 - References
 - Professional biography
- Formatting requirement: Same as proposal