Fall 2021 VE496
Lecture notes
Week 6

Academic research vs. workplace research

Academic research

- **More abstract than applied**

For example:

“What would be the effect on the trade balance between the US and China if China lowered the value of its currency by 10%?”

“At what age do babies learn to focus on people’s eyes?”

- **Focusing on the underlying principles of a phenomenon.**

Workplace research:

your goal is to find information to help you answer a ***practical*** question:

For example:

“Should we replace our sales staff’s notebook computers with tablets?”

“What would be the advantages and disadvantages to our company of adopting a European-style privacy policy for customer information?”

Workplace research:

- **focus** on improving a situation at a particular organization.
- **call for** considerable primary research requiring you to learn about your own organization's processes and how the people in your organization would respond to certain ideas or changes
- **address** the needs of customers or other stakeholders.

Academic research

Workplace research

Primary & secondary research methods

Same goal: to help you answer questions.

Proposals & Reports

Proposals

Offer structured persuasion for internal or external audience

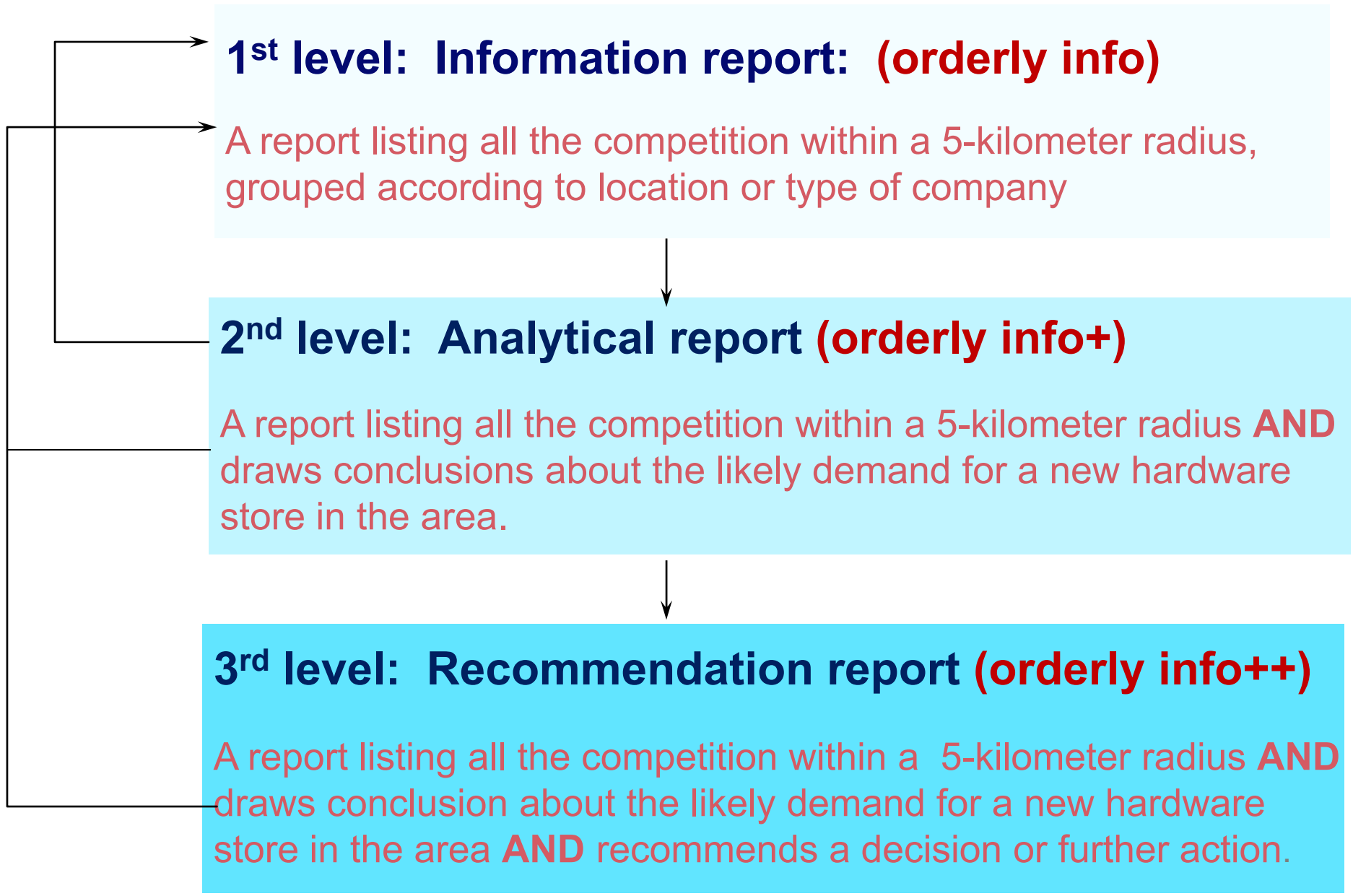
Informational Reports

Offer available data, facts, without analysis or recommendation

Analytical reports

Offer both info & analysis, and they can also include recommendation

3 levels of reports



8 basic organizational patterns:

1. Chronological
2. Spatial
3. General to specific
4. More important to the least important
5. Comparison and Contrast
6. Classification or partition
7. Problem-method-solution
8. Cause and effect

6 types Analytical reports:

1. Market analysis reports
2. Due diligence reports
3. troubleshooting reports
4. Failure analysis report
5. Feasibility reports
6. Justification reports

Recommendation reports:

- **Reports to provide recommendations.**
  - Workplace research papers carried out to clarify short-, mid-, and long- term business development interests.
  - Often prepared by *internal employees* and *external consultants.*

Purpose statement answers the question of why a report exists.

also called the report's objective, aim, or goal.

It is often written in the form of an infinitive phrase ("to….")

To investigate…
To explore…
To understand…
To compare…
To determine…
Etc.

Writing a Purpose Statement:

It is often written in the form of:

1. **a research question**
2. **infinitive phrase** *("to…..")*

Example:

If your **problem** is that Company X wants to know why sales are declining, your purpose statement may be:

- "What are the causes of decreasing sales at X?"
- "to determine the causes of decreasing sales at X"

Exercise: For each **problem statement** below, write a **matching purpose statement**

1. Our company's market share is steadily declining.

2. Our current computer network lacks sufficient bandwidth and cannot be updated to meet our future needs.

3. We need $2 million to launch our new product.

4. Our current operations are too decentralized and expensive.

1. Our company's market share is steadily declining.

   - **to explore** new ways of promoting and selling our products and to recommend the approaches most likely to stabilize our market share.

2. Our current computer network lacks sufficient bandwidth and cannot be updated to meet our future needs.

- **to analyze** various networking options and to recommend the system that will best meet our company's current and future needs.

3. We need $2 million to launch our new product.

- **to convince** investors that our new business would be a sound investment so that we can win over desired financing.

4. Our current operations are too decentralized and expensive.

- **to justify** the necessity of closing down some branch offices and or laying-off some workers

Problem/Need statement vs. Purpose Statement

How you define this problem (need) will determine your report's purpose.

8 key terms:

1. Proposal
2. Project deliverable
3. Design by committee
4. Design thinking
5. Benchmarking
6. Development cycle
7. Prototyping
8. Iteration

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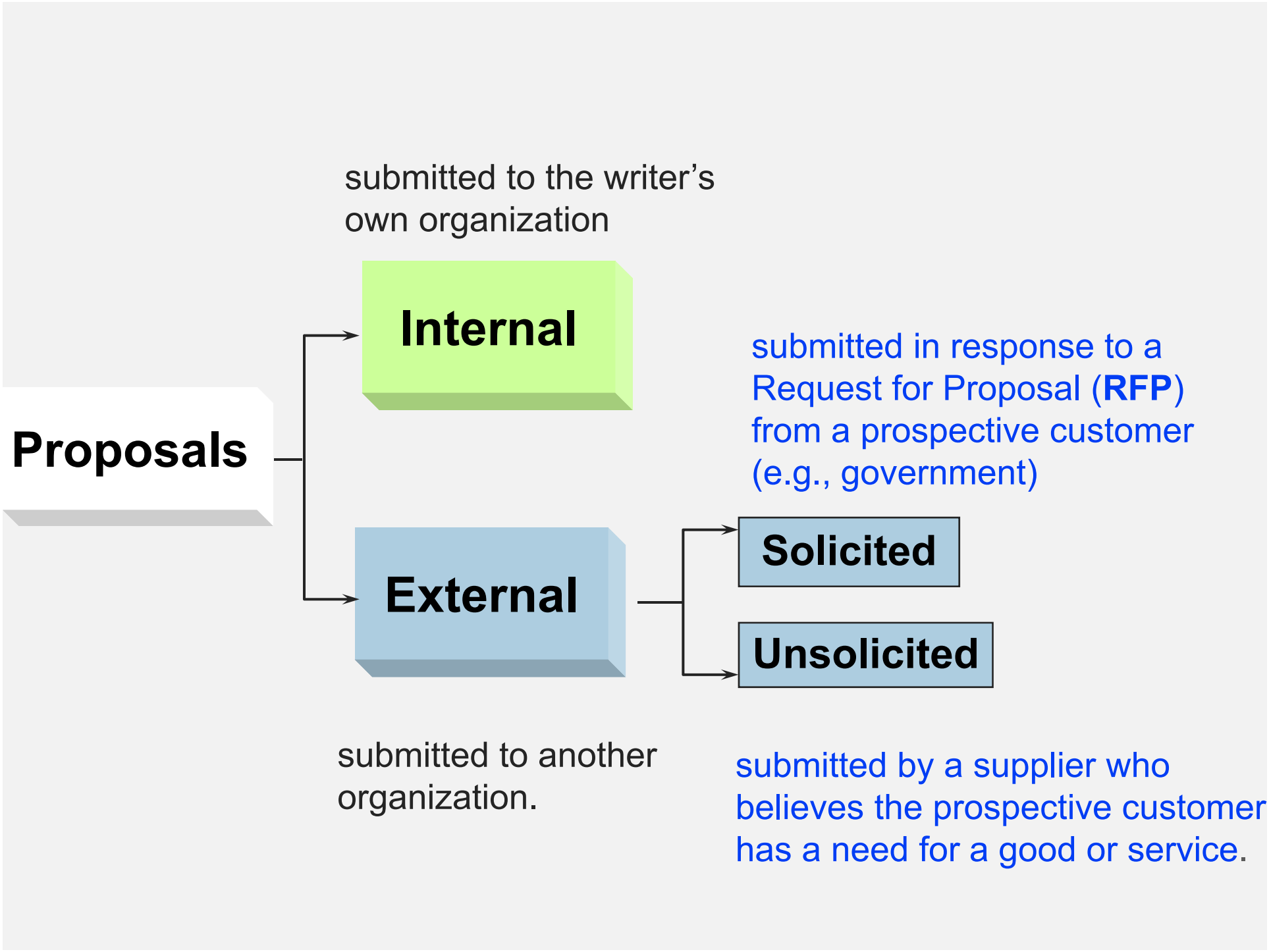

submitted to the writer's own organization
Internal
Proposals
submitted in response to a Request for Proposal (RFP) from a prospective customer (e.g., government)
External
Solicited
Unsolicited
submitted to another organization.
submitted by a supplier who believes the prospective customer has a need for a good or service.

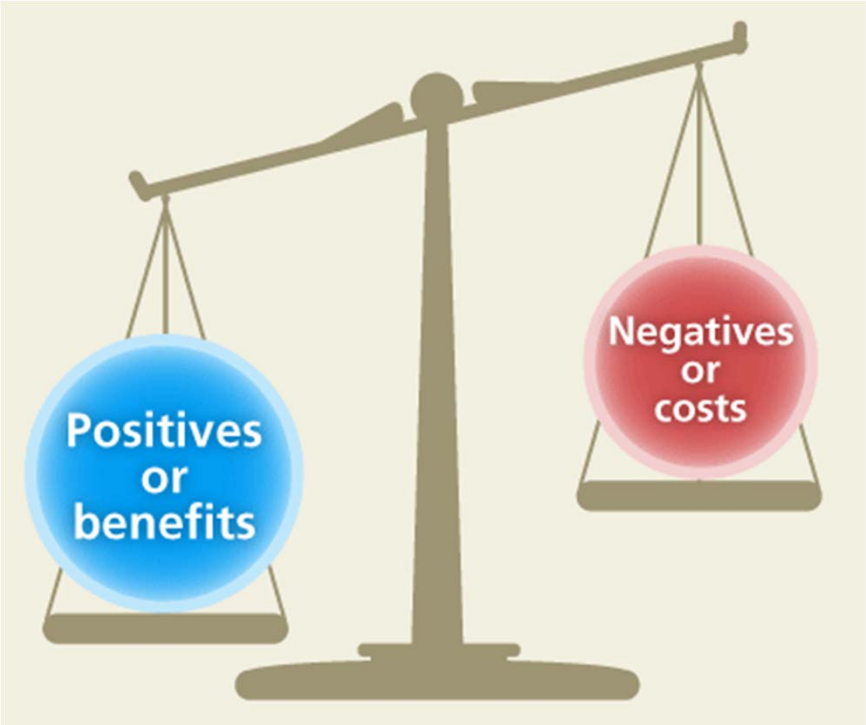
Evaluation criteria for competitive proposals

- **Relevance:** What problem are you going to solve?
- **Innovation:** How are you going to solve it?
- **Deliverable:** What exactly will you provide for us?
- **Feasibility:** Can you deliver what you promise?
- **User benefits:** What benefits can you offer?
- **Timeline:** When will you complete the work?
- **Cost:** How much will you charge?

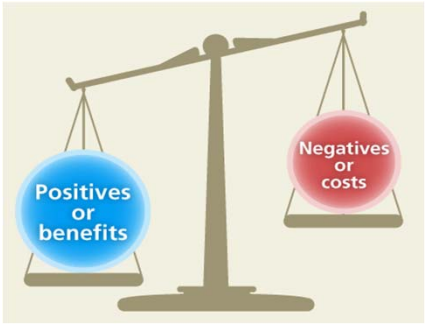
Persuasion & Proposal

A proposal is an argument.

Future **benefits** > the immediate **costs.**



Cost-benefit analysis (CBA)



CBA has two purposes:

1. To determine if an investment/decision is sound (justification/feasibility) – verifying whether its benefits outweigh the costs, and by how much;

2. To provide a basis for comparing projects – which involves comparing the total expected cost of each option against its total expected benefits.

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Proposals have 2 goals

1. To get the project accepted
2. To get you accepted to do the project

   1 + 2 = the winning bid

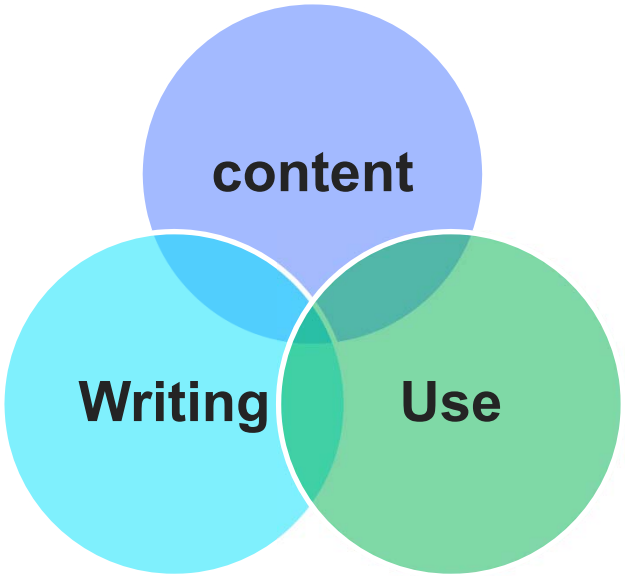
Must stress:

- Reader benefits
- Specific supporting evidence

Must present professional image:

- Quality of content
- Quality of presentation

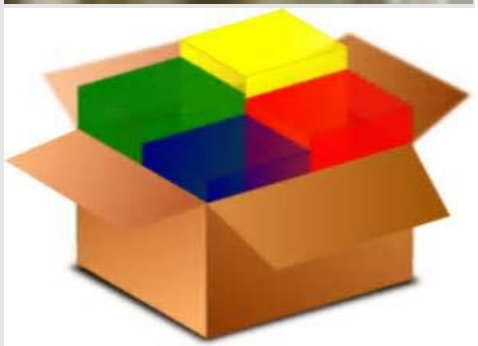
Content and writing CANNOT be separated



Project "Deliverables"

3 types of deliverables:

1. Research (report)
2. Goods (product)
3. Services (consulting)



Proposal & Persuasion

Persuade your readers of 3 things:

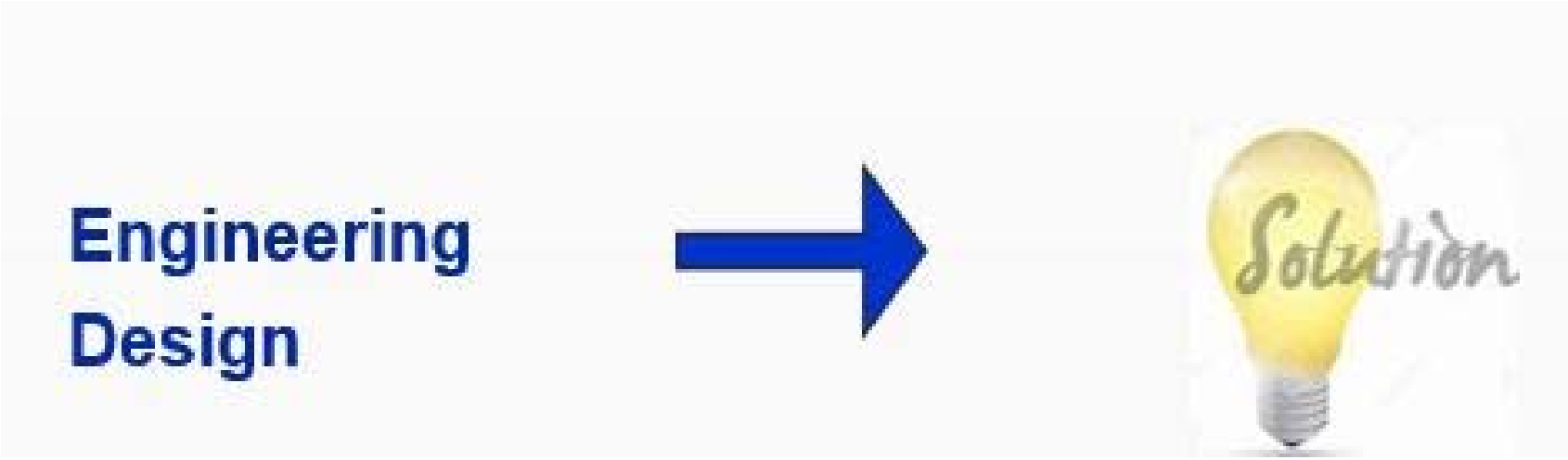
1. A problem exists & you understand people's needs
2. You have a plan for satisfying those needs
3. You can deliver what you promise

Design by committee

A design process based on consensus building, group decision, and extensive iteration.

What is design?

The most fundamental definition of design is to solve problems.



iPod (first appeared on market in 2001)

“1000 songs in your pocket”

How To Assess your Customers' Unmet Needs

Benchmarking

Comparing your product to:

- **Similar products** already on the market
- **Previous solutions** and their **drawbacks**

What is new and different about your design?

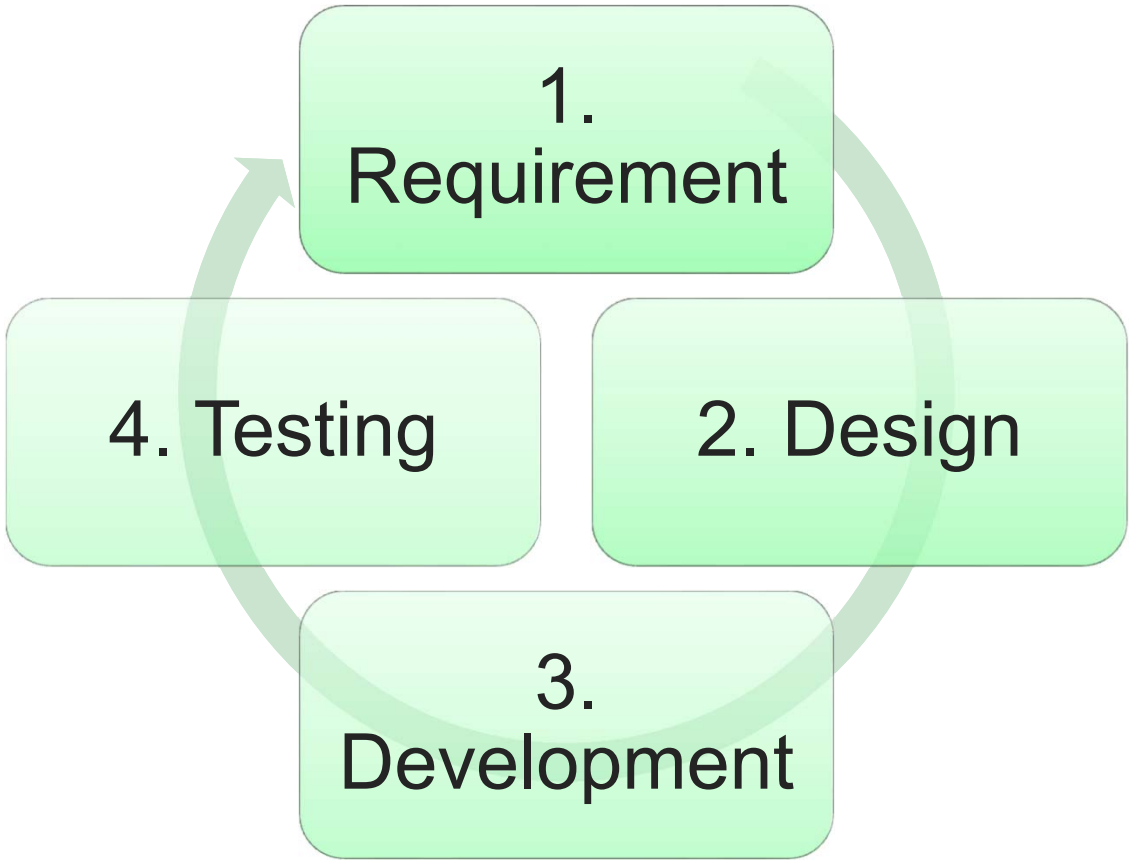
What is your innovation?

Benchmarking

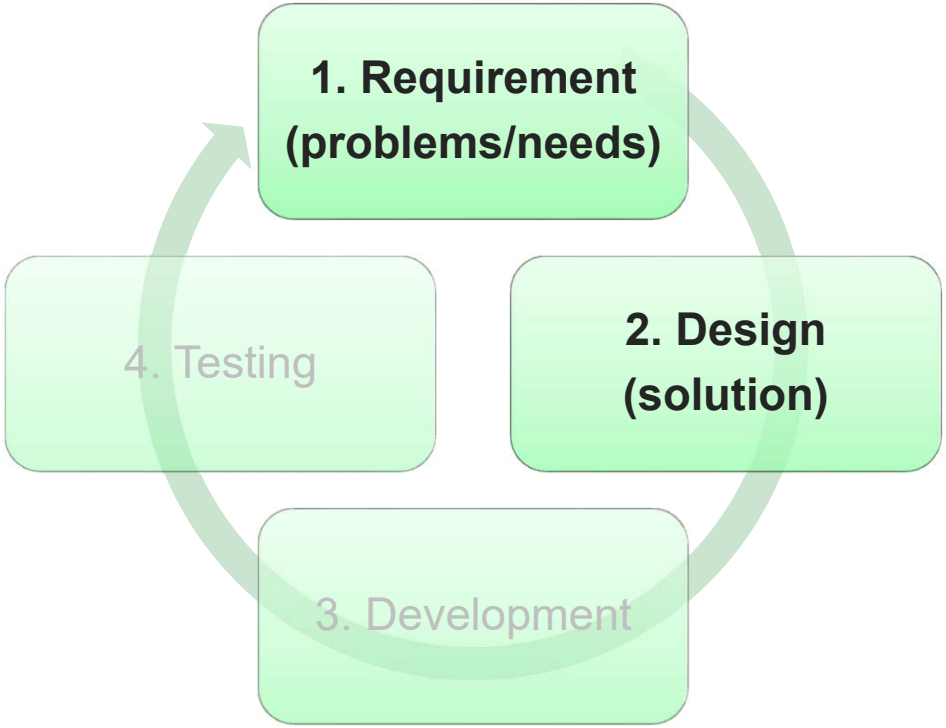
Before	→	After
Existing design	→	“better” design
“Flawed” design	→	“Improved” design

Will my ideas lead to *a “better” & “improved”* design? *How?*

Development cycle: 4 stages



Development cycle



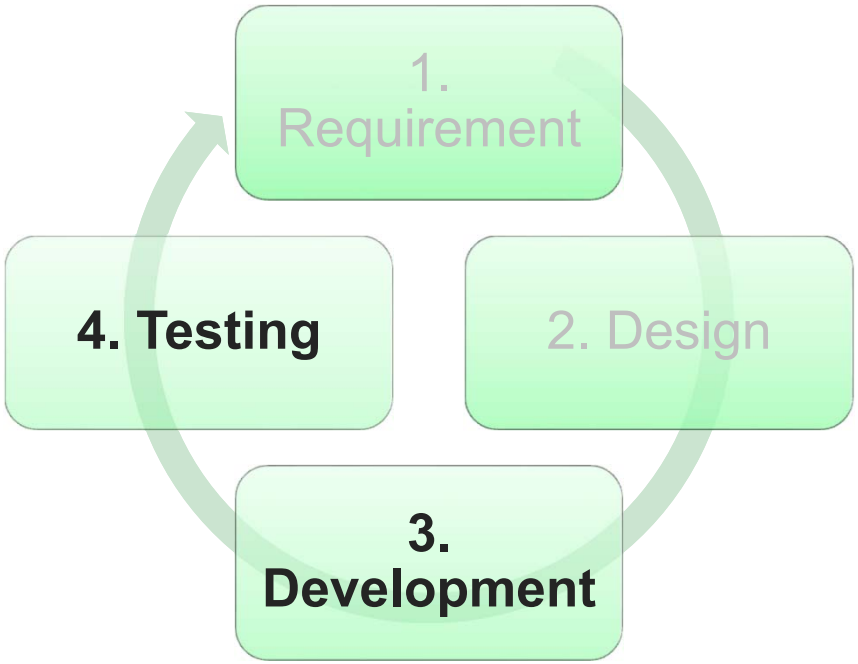
1. Formally gathered through:
   market research
   customer feedback
   usability testing

   OR informally derived from:
   direct knowledge or experience.

2. Design requirements are translated into a form that yields a set of specification.

   The goal is to meet design requirements.

Development cycle:

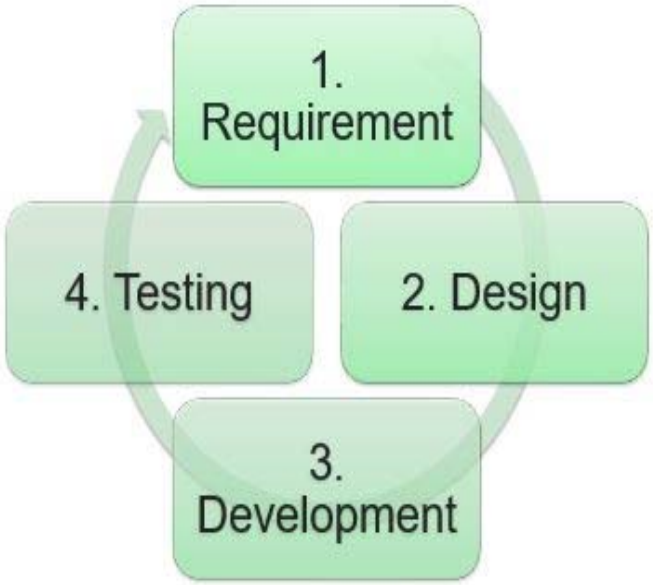


3. Design specifications are transformed into an actual product. The goal of development is to meet specifications.

4. Product is tested to ensure that it meets design requirements & specs & will be accepted by the target audience.

- Testing generally focuses on the quality of modules and their integration, real- world performance, and ease and reliability of installation.

Development cycle: 4 stages



1. Formally gathered through market research, customer feedback, usability testing OR informally derived from direct knowledge or experience.

2. Design requirements are translated into a form that yields a set of specification. The goal is to meet design requirements.

3. Design specifications are transformed into an actual product. The goal of development is to meet specifications.

4. Product is tested to ensure that it meets design requirements and specifications, and will be accepted by the target audience.
   - Testing generally focuses on the quality of modules and their integration, real- world performance, and ease and reliability of installation.

Iteration

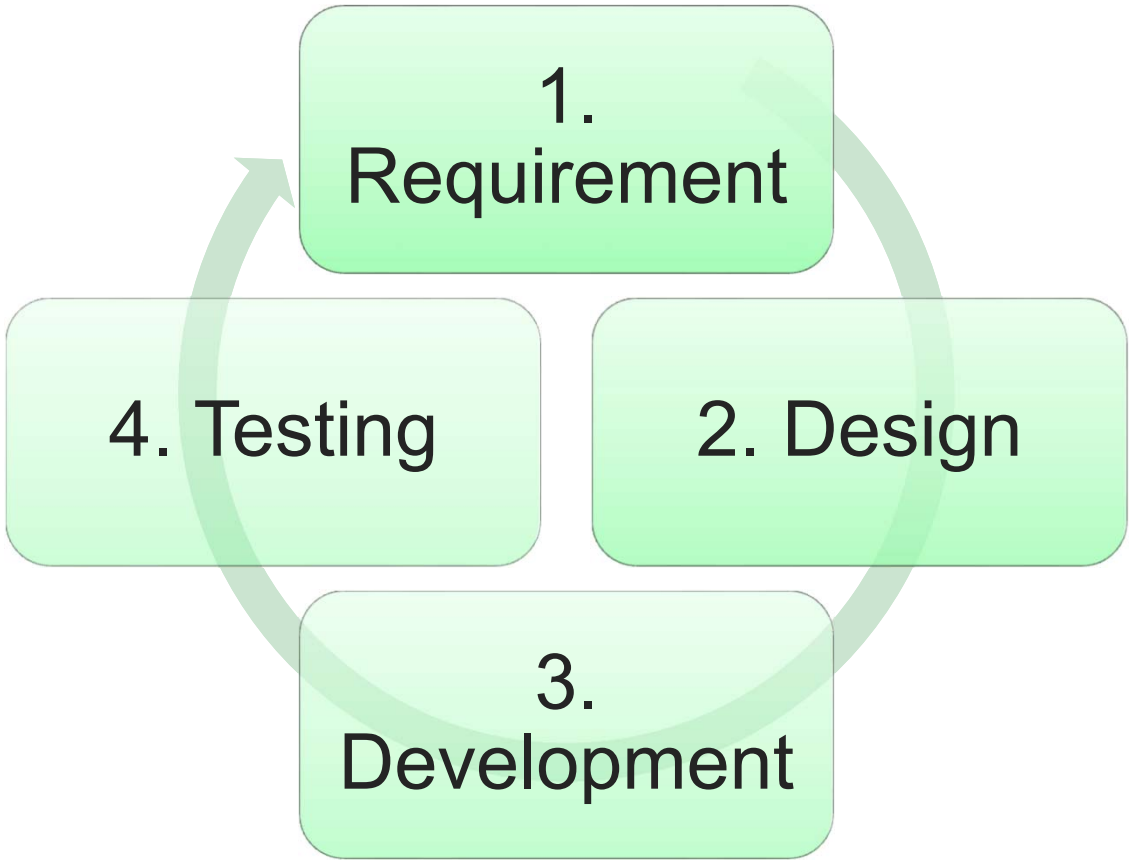
A process of **repeating** a set of operations until a specific result is achieved.

Design iteration takes place until design requirements are met

Design is an *iterative* process.

No solution is once and for all..

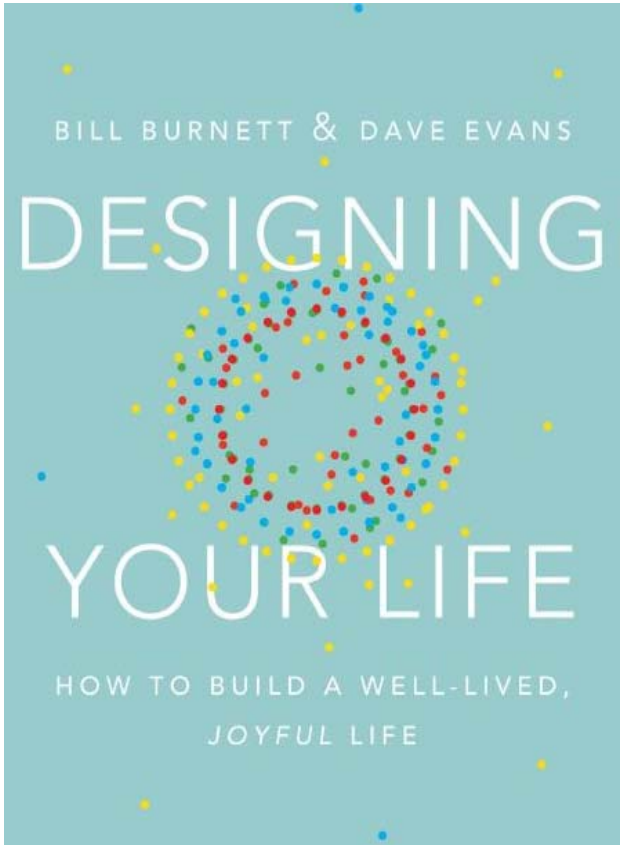
Development cycle: 4 stages



Prototyping

Using simplified & incomplete models of a design to:

- *explore* ideas
- *elaborate* requirements
- *refine* specifications
- *test* functionality



What is Design Thinking?

Design thinking is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create solutions to prototype and test.

Involving **five** phases:

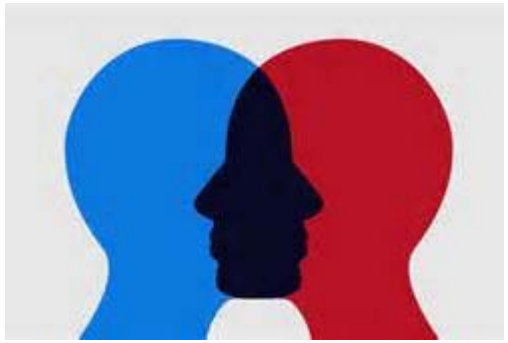
1. Empathize
2. Define
3. Ideate
4. Prototype
5. Test

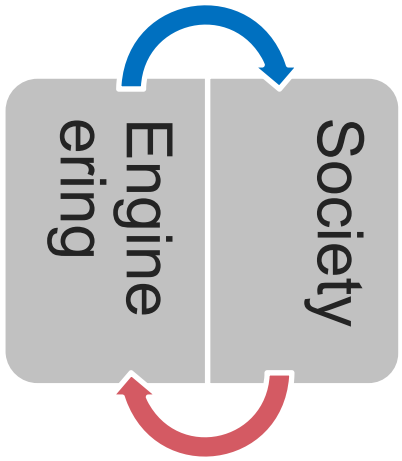
Excellent design *accomplished through*:

- careful research of existing or similar solutions
- active brainstorming of diverse project members
- extensive prototyping
- many iteration of trying, testing & tuning concepts

Key ingredients in the pursuit of innovation

- Empathy
- Humility
- Compassion
- Conscience





Capstone Final report

- Cover page
- Abstract or executive summary
- Table of contents

Front matter

- Introduction
- Concept generation
- Concept selection
- Concept description
- Parameter analysis
- Final design
- Manufacturing plan
- Test results
- Discussion
- Recommendations
- Conclusions

Diagrams, graphs, figures in **the body of report** to support text

- Acknowledgment
- References
- Appendix

Back matter

Thank you!

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