



**BME 590: FUNDAMENTALS OF
ENGINEERING DESIGN**

DESIGN CRITERIA & USER DEFINED SCALES

Salinas - Fall 2017

DEFINE

UNDERSTAND CLIENT'S NEEDS AND
DEVELOP AN ACTIONABLE PROBLEM
STATEMENT



**SYNTHESIZE
FINDINGS INTO
NEEDS AND
INSIGHTS**



**CONSTRAIN
PROJECT INTO A
FOCUSED NEED**

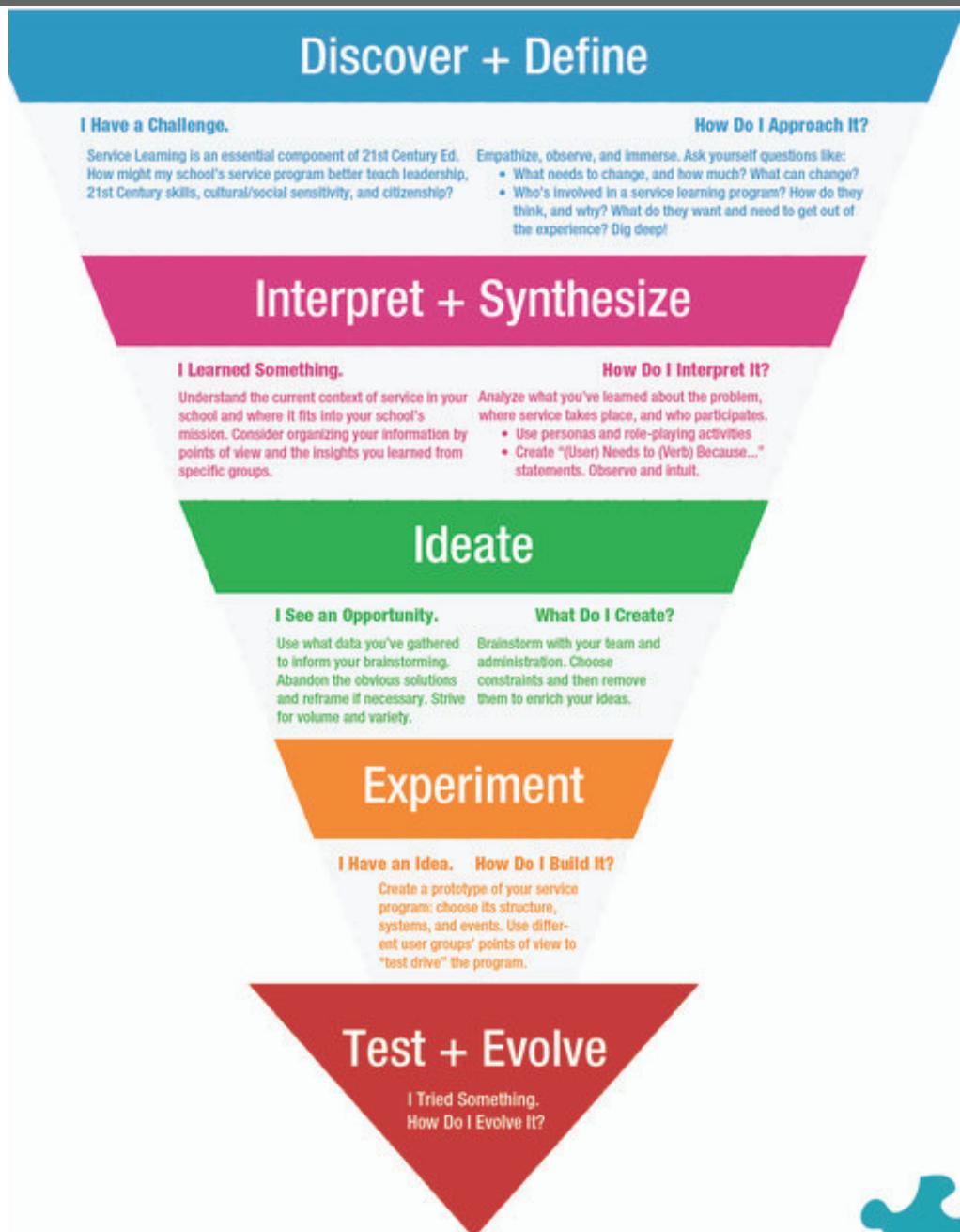


**CREATE A POINT-
OF-VIEW
STATEMENT**

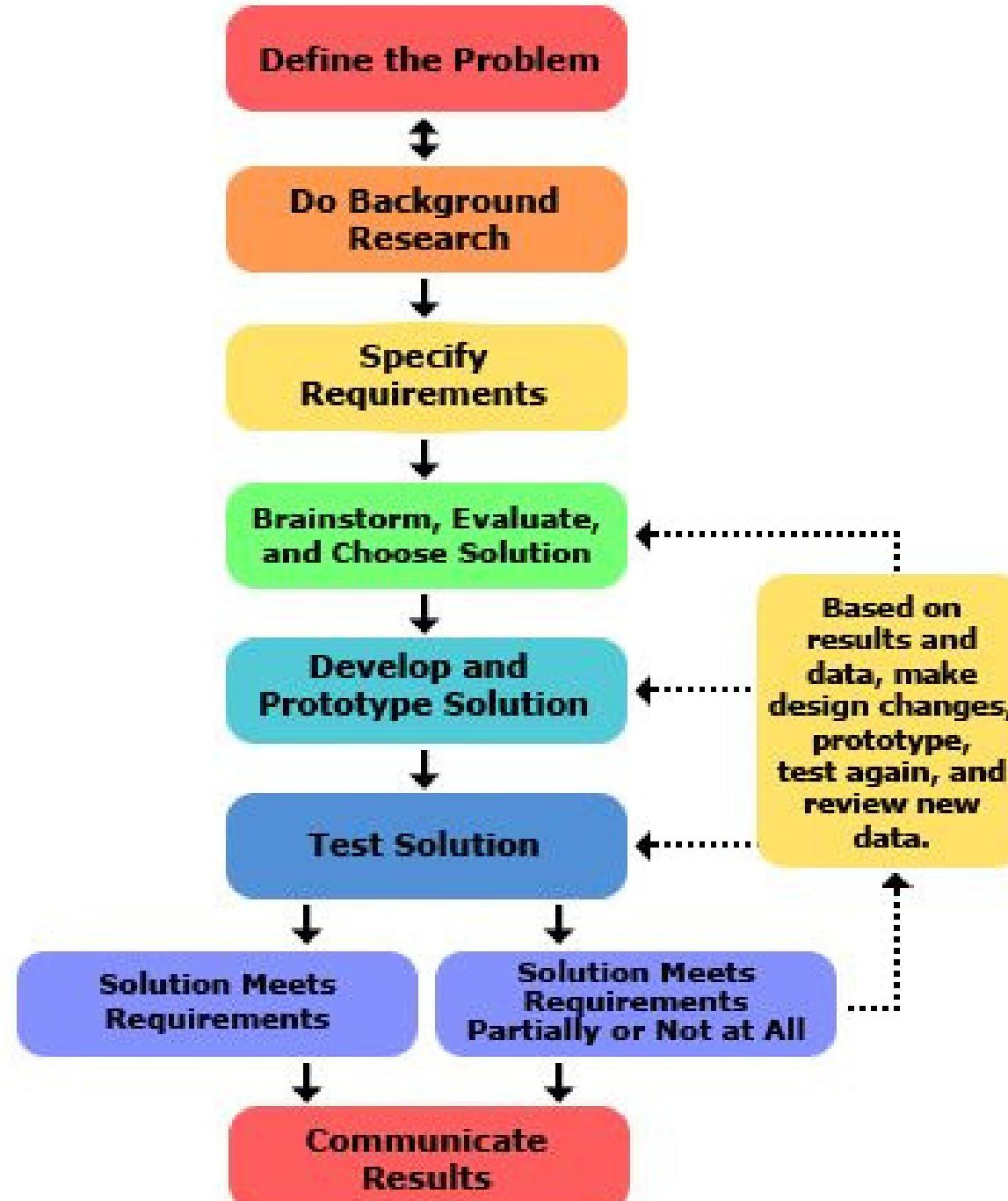
POV

POINT-OF-VIEW
frames the problem into an actionable statement
provides reference for evaluating ideas
fuels brainstorming sessions
revisited and reformulated throughout design process

DESIGN CRITERIA

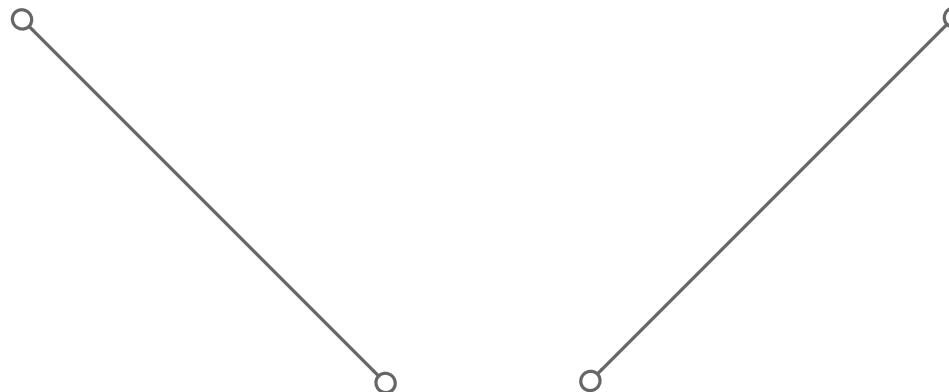


DESIGN CRITERIA



DESIGN CRITERIA

OBJECTIVES



CONSTRAINTS

DESIGN CRITERIA

OBJECTIVES

- attribute of design
- vague
- ambiguous

DESIGN CRITERIA

- specific target of design
- quantitative
- clear on how to measure

CLIENT NEED

new and improved travel coffee mug

OBJECTIVES

- ease of use
- durability
- length of use
- color



DURABILITY-OBJECTIVES

- repeated use
- more durable than existing model
- fails under certain conditions

DURABILITY-CRITERIA

- lasts ≥ 3 years
- open and close ≥ 1 million times
- survives drop of $\leq 10\text{ft}$



CRITERIA

- quantitative measure
- bounded by # or range

for example:

Cost \leq \$50

Force withstand \geq 500 N

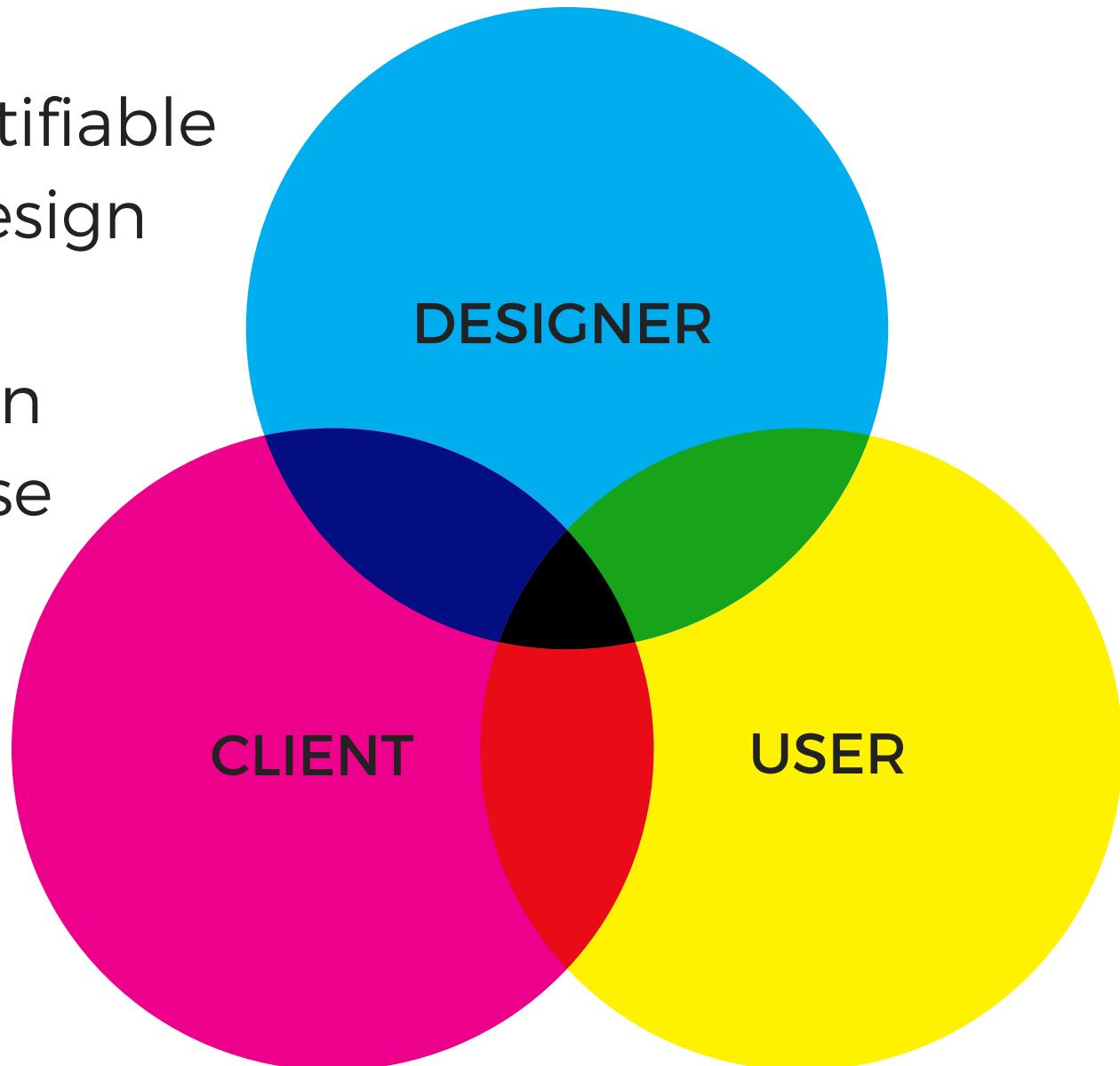
Maintain temp between (50° and 75°F)

Diameter = 3 3/4" width

Concentration \pm 5% by volume



Establishing quantifiable and reasonable design criteria aids in the constructive design process for all those involved.



USER DEFINED SCALES

NEED: new and improved travel coffee mug

OBJECTIVES

- Ease of Use
 - easy to clean
 - easy to fill
 - easy to drink from
- Convert qualitative objectives
- to quantitative criteria



USER DEFINED SCALES

1. Select a scale range
2. Identify attributes for each level
3. Set design criteria

Attribute/Characteristic: Ease of USE

