SAC
SMITH ANALYTICS CONSORTIUM

5th Annual Datathon

Core Consulting Workshop

March 29th, 2024

https://go.umd.edu/datathon2024

Time	Activity
2:00 pm – 2:05 pm	Welcome / Introductions / Timeline
2:05 pm – 2:20 pm	Human Centered Design
2:20 pm – 2:25 pm	Q&A / Wellness Break
2:25 pm – 2:45 pm	Data Visualization and Design Best Practices
2:45 pm – 2:50 pm	Q&A / Wellness Break
2:50 pm – 3:10 pm	Structure and Storyboarding
3:10 pm – 3:40 pm	UMD Datathon Reveal / Requirements / Overview
3:40 pm – 4:00 pm	Q&A / Wrap-up

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UMD Core Consulting Workshop

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Human Centered Design

Objectives

By the end of this section, you will have knowledge on:

- How to apply human-centered design & design thinking principles

- How to apply a problem-solving approach

Today's Presenters

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Iesha Agrawal
Senior Consultant
Risk and Financial Advisory

Fun fact: I recently started to learn how to play the piano.

Meaghan Farrell
Consultant
Core Business Operations

Fun fact: I'm a certified ski instructor and have taught first-timers, free-style, and alpine race teams!
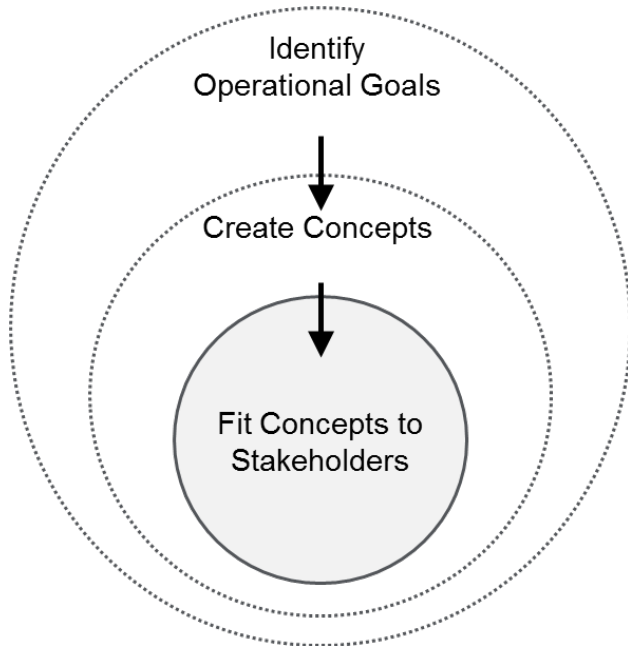
HCD & Design Thinking

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Human-centered design (HCD) is a creative approach to problem solving. HCD is about **cultivating deep empathy** with the people you're designing for. It has an emphasis on convergent and divergent thinking that aligns with it's 4 phases: discover, define, develop, and deliver.

Design thinking is a human-centered approach to **innovation**. Successful innovations rely on some element of HCD research while balancing other elements (i.e., integrating the needs of people, the possibilities of technology, and the requirements for business success). Design thinking helps achieve that balance. It lets people find the sweet spot of *feasibility, viability and desirability* while considering the real needs and desires of people. There are 5 stages, and it is a very flexible, non-linear process.
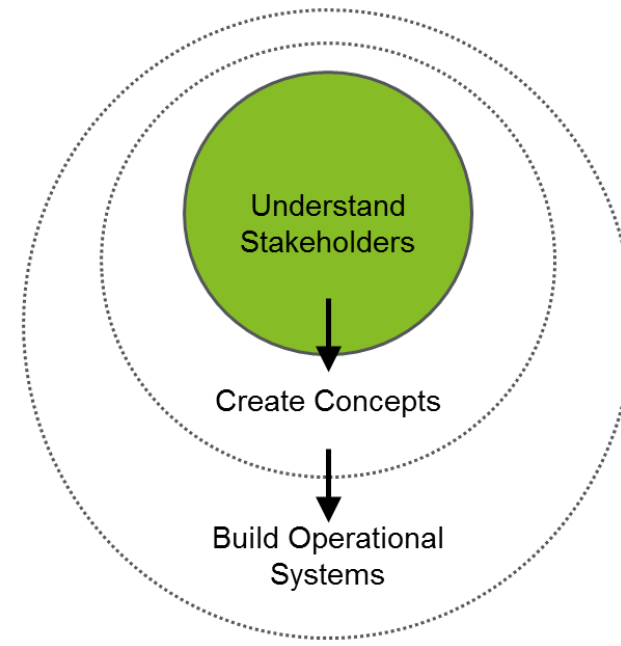
Design Thinking

Design thinking transforms the traditional management approach by starting from a different place. Problems are framed differently when you begin by understanding the human stakeholders, rather than by pushing conceptual objectives

Traditional Management Approach

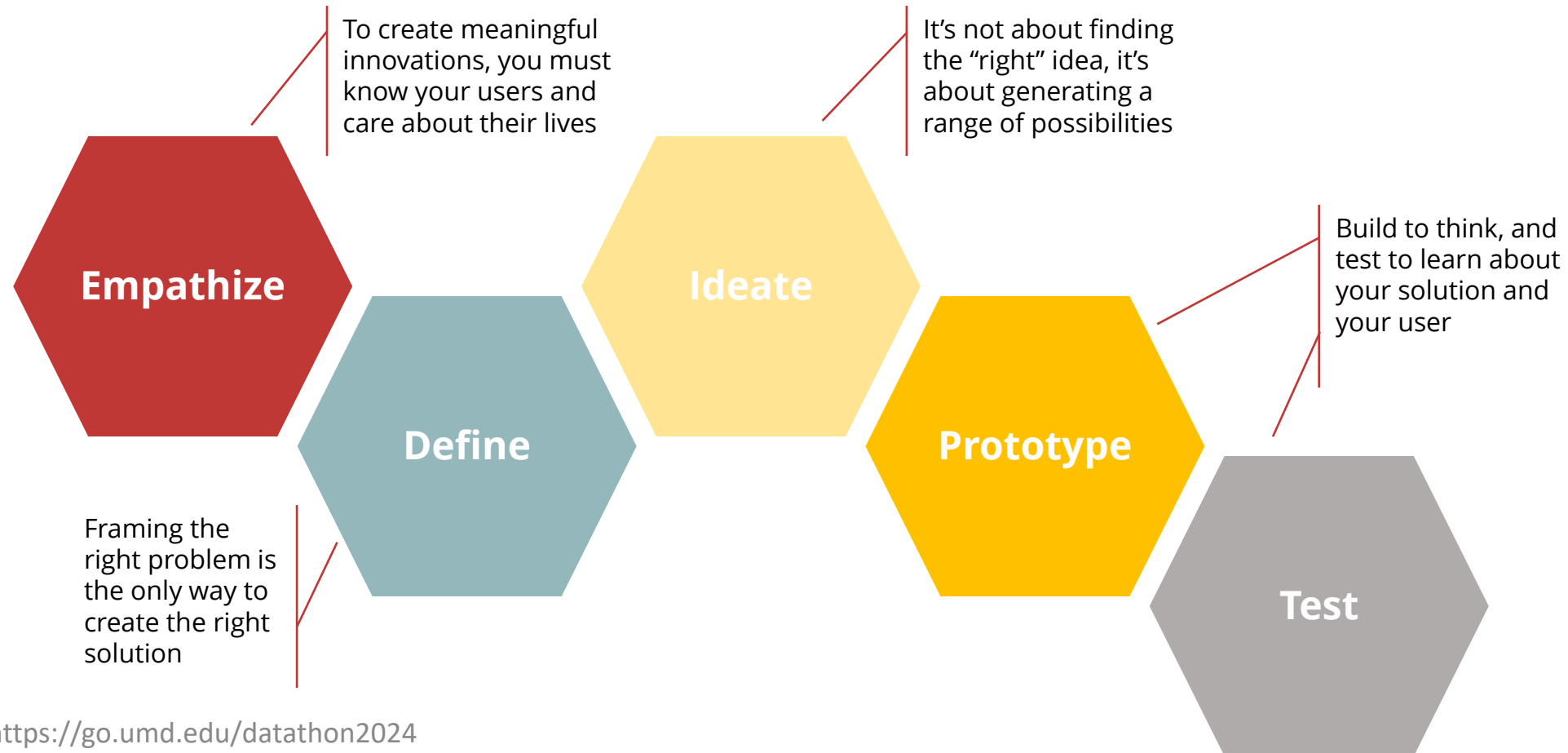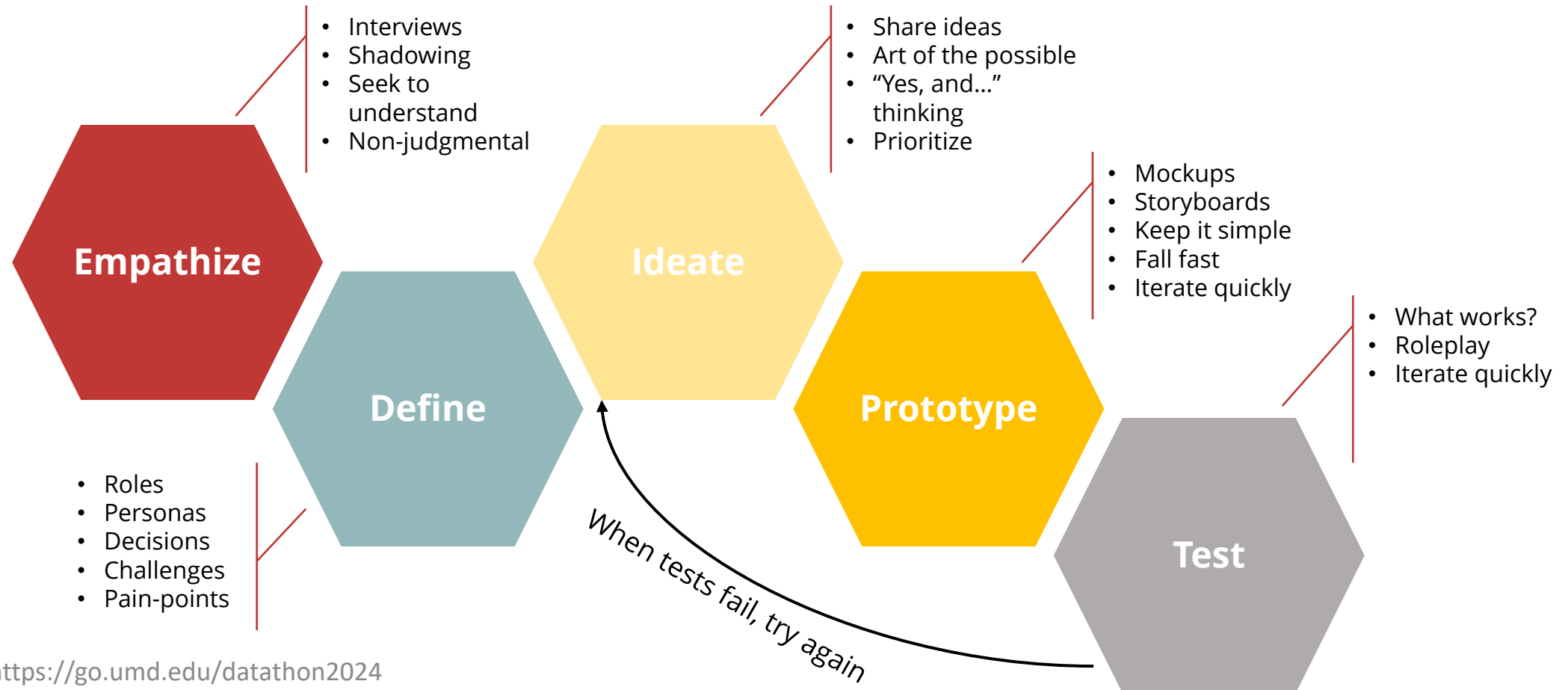**Design Thinking Approach**

VS.

Design Thinking

By putting the user/customer at the center of design and following Agile development protocols, products and services can be created with confidence

Empathize
- Interviews
- Shadowing
- Seek to understand
- Non-judgmental

Define
- Roles
- Personas
- Decisions
- Challenges
- Pain-points

Ideate
- Share ideas
- Art of the possible
- "Yes, and…" thinking
- Prioritize

Prototype
- Mockups
- Storyboards
- Keep it simple
- Fall fast
- Iterate quickly

Test
- What works?
- Roleplay
- Iterate quickly

When tests fail, try again

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Problem Solving Approach
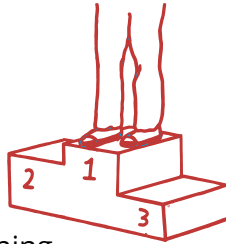
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Step 1: Define the Problem

Benchmarking

What is it Used For:

Used to develop a strong and competitive understanding and to help focus scarce resources more effectively.

How to Use it:

1. Identify relevant best practices and benchmarking studies.
2. Leverage these resources by reviewing the findings and determining the applicability.

Gap Analysis

What is it Used For:

Used to define the present state, the desired or 'target' state, and the gap between them.

How to Use it:

1. Determine where you are now in relation to your goal(s). Be as detailed as possible.
2. Assess where you want to be, meaning what is the end result or goal that you hope to achieve. Be specific!
3. Look for the gap and determine the nature of the gap (if one exists).
4. Determine root causes for the gap and strategies for how to close it.
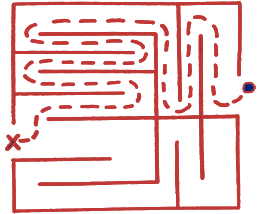
Step 2: Analyze the Problem

Fishbone Diagram

What is it Used For:

Used to analyze complex problems that appear to have many interrelated causes.

How to Use it:

1. Identify the problem statement in the box (the head of the fishbone = effect).
2. Determine the categories which should be placed on the various "bones" of the "fish."
3. Begin with the major category that is the most likely to produce the actionable root cause and begin to ask "Why."
4. Complete the entire fishbone for every category.
5. Identify the most likely root cause(s) and circle them.

Category   Category

Cause

Problem Statement

Category   Category
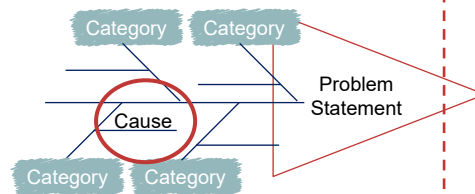
Five Whys

What is it Used For:

Used to determine the ultimate root cause of a problem by continuing to ask "why."

How to Use it:

1. Each time you can answer "why," you are probably identifying a symptom caused by something else.
2. Keep asking "why" until you can no longer generate a logical answer. This lowest level is likely to be a root cause and is what generates the observed symptoms.
3. You may discover more than one root cause through this analysis.

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Problem Solving Approach

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Step 3: Identify Possible Solutions

Stop, Start, Continue

What is it Used For:

Used to gather ideas from individuals about what the organization must stop, start, and/or continue doing to resolve a problem.

How to Use it:

1. Identify ideas about what must stop, start and continue occurring in order to resolve the problem.
2. Summarize key points and assign an impact rating to each.
3. Develop an action plan to address the key points.

Brainstorming

What is it Used For:

Used to encourage creative thinking and help generate ideas.

How to Use it:

1. Present a problem that needs to be resolved.
2. Call out any ideas that come to mind.
3. Avoid evaluating any individual ideas.

Step 4: Select Best Solution

Cost/Benefit Analysis

What is it Used For:

Used to compare the gains (benefits) and losses (costs) associated with a course of action to determine whether it is viable.

How to Use it:

1. Brainstorm costs and benefits.
2. Assign a monetary value to the costs.
3. Assign a monetary value to the benefits.
4. Compare costs and benefits.

Weighted Criteria

What is it Used For:

Used to aid decision-making involving a large number of criteria. Criteria are 'weighted' based on their importance to the decision, in order to provide an objective assessment of a decision per the priorities.

How to Use it:

1. Identify criteria that your decision should ideally meet.
2. Determine the criteria weighting scale.
3. Assign a weight to each criteria (ensuring there is differentiation).
4. Review each decision option and rate its ability to meet the criteria.
5. Calculate the total weighted assessment, thus leading you to the best option.

Q&A & Wellness Break (5 min)

Objectives

By the end of this section, you will have knowledge on:

- Recognize leading practices for creating visual presentations

- Identify the pros and cons of different visualization techniques

- Analytics design principals – how key questions can craft the story you want to tell

- How visualizing data and slides can help give depth to your argument

Why Design Matters

Design helps solicit a strong emotional response and connection to a product.

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1/20th sec.
Total time it takes a user to determine **if they like the dashboard's design**

#1
Indicator of dashboard credibility is **good design**

95
Percent of respondents agreed with the statement that **"good user experience just makes sense."**

94
Percent of first impressions of dashboards are **design-related**

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Getting started — Audience Considerations

Who are the viewers?

- How technical is the audience? Will they understand the visualization presented?
- Cultural questions that affect design choices
  - Language and social context
  - What do colors mean
  - What icons are familiar
- Consider all possible obstacles of audience perception.
  - For example, a significant percentage of the population is colorblind, a consideration which may affect the color chosen

How are visualizations being viewed?

- Live presentation
  - Printed on paper?
  - Projected on a large screen?
- Stand-alone content
  - Interactive devices?
  - Static presentation?
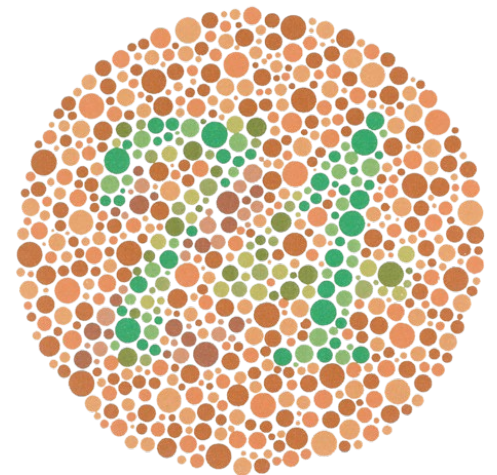
Ishihara Color Test is an example of a **color perception test**

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Outlining Chart Types

Certain type of charts are more commonly used to visualize specific types of comparisons

	Bar	Line	Pie	Scatter
Ranking Items	✔			
Change Over Time		✔		
Frequency Distribution		✔		
Percentage of a Total			✔	
Relationship Between Variables				✔

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Information Design

Design tips for creating effective data visualizations

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KEEP IT SIMPLE

Simple design leads to digestible information

BE CREATIVE AND VISUAL
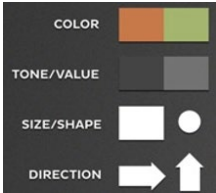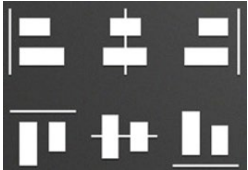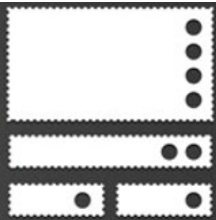
Use color, visual encodings, pre-attentive attributes and consider the data to ink ratio

BE CLEAR

Organize information in a clear hierarchy

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Be Creative and Visual: Design Principals (CARP)

Principle		Description	Examples
	Contrast	Unique elements in a design should stand apart from one another. One way to do this is to use contrast. Good contrast in a design allows the viewer's eye to flow naturally.	• Color • Tone/Value • Size/Shape • Direction
	Alignment	Proper alignment is a design means that every element in it visually connected to another element. Alignment allows for cohesiveness in a dashboard.	• Align Left/Right • Align Top/Bottom • Align Center/ Middle
	Repetition	Repetition breeds cohesiveness in a design. Establish a style for each element in a design and use it on similar elements.	• Layout • Filter appearance • Chart consistency
	Proximity	Proximity allows for visual unity in a design. If two elements are related to each other, they should be placed in close proximity to one another.	• Workbook and individual dashboard view

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Be Creative and Visual: Color

A color scheme is important to convey a wide array of messages. Color is used to generate emotions, define importance, create visual interest and more.

THE PSYCHOLOGY OF COLOR
Color plays a major role in perceptions as they have distinct connotations that you should be aware of before use.

Activating, stimulating, passionate, exciting, powerful
Use as an accent to draw attention, portray downward trend

Balanced, vibrant, energetic, inviting
Use to portray warnings, depict movement

Bright, happy, warm, stimulating
Use as a highlight, to portray happiness

Relaxing, stable, rejuvenating, positive
Use to portray positive values

Loyalty, trustworthiness, integrity, security, calm
Use as an alternative choice for positive values

Be Creative and Visual: Best Practices

Best Practices	Explanation
1. Never use more than 7 colors	Controlling color usage provides consistent messaging and appearance (i.e. don't strain the user's eyes)
2. Keep in mind traditional use of colors	Some colors have a traditional meaning. For example, green indicates profitability or good while red indicates unprofitability or bad. Other use outside of this may confuse the user.
3. Import client colors when possible	Clients enjoy when their Tableau dashboards have that custom look and feel. Invest the time to find their colors and use them!
4. Keep in mind the use of color for dual axis charts	Dual axis charts add greater complexity to visual; however, consider simplifying the color scheme in those circumstances, not to mention that color transparency can change the color
5. Make sure Tableau chart and filter backgrounds match the background image color when possible	Adding a background image to a dashboard adds a custom flavor; however, if not properly configured, the visuals can look out of place

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Be Creative and Visual: Data-to-Ink Ratio

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Consider the data-to-ink ratio to draw the viewer's attention to the substance of the data and eliminate chart junk.
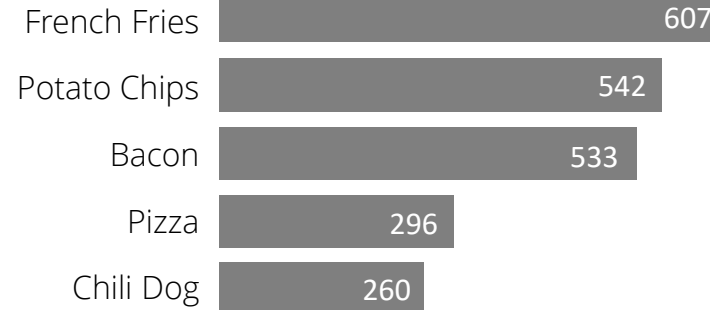
$$\textbf{Data-to-Ink ratio} = \frac{\text{Data ink}}{\text{Total ink used in visualization}}$$
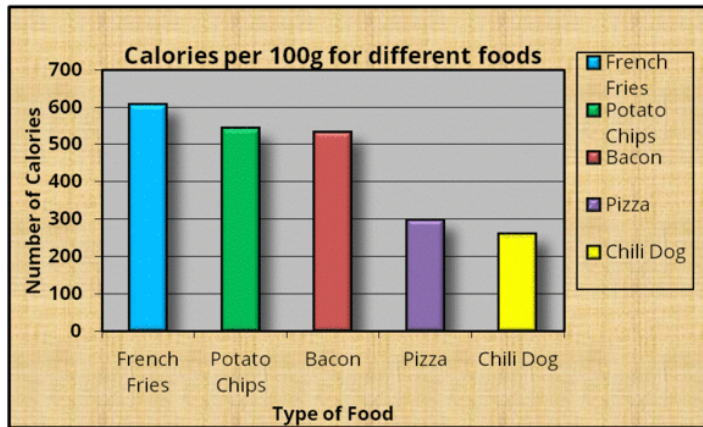
Calories per 100g

French Fries	607
Potato Chips	542
Bacon	533
Pizza	296
Chili Dog	260

Anatomy of an Ideal Slide

Header is clear, concise and consistent capitalization

Text is limited and font/color is consistent (if using bullets, always remember to check for consistent spacing)

Use of graphics, icons, or tables to provide a visual representation of information

Information on slide follows logical format, either vertically or horizontally

If a kicker is used, make consistent and concise/communicative of the main point

Q&A & Wellness Break (5 min)

Structure and Storyboarding

Module Objectives

By the end of the following module, you will have knowledge on:

- How to take insights and turn them into presentations

- How to apply the pyramid structure

- How to apply the S-C-Q approach

- How to create a storyboard

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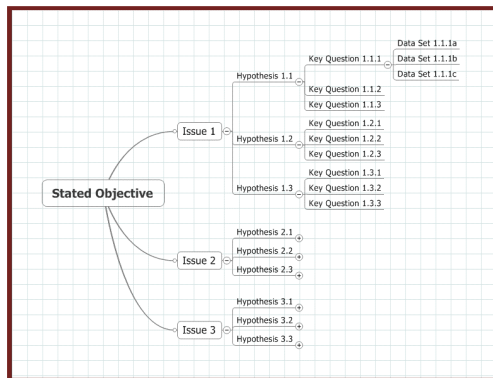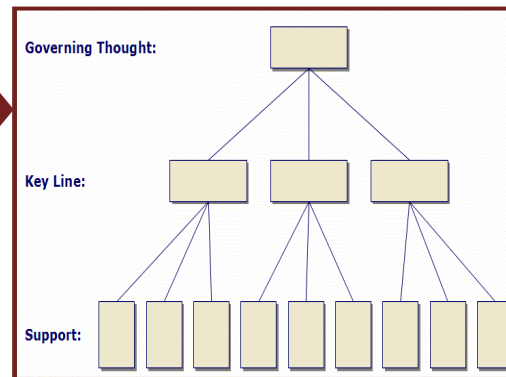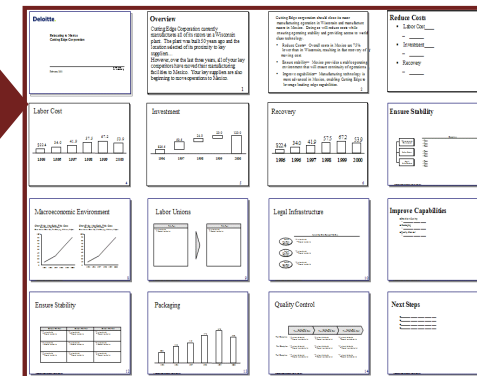
The Pyramid Structure

One logical structure is referred to as the pyramid structure. Most business communications can benefit from a pyramid structure — starting with the point, then supporting it logically.

Pyramid Structure

Governing Thought:

States the answer to the question raised in the reader's mind

Recommendation

Key Line:

Major points, which taken together, support the answer

Supporting Logic

Support:

Data and facts that support the key line

Supporting Facts
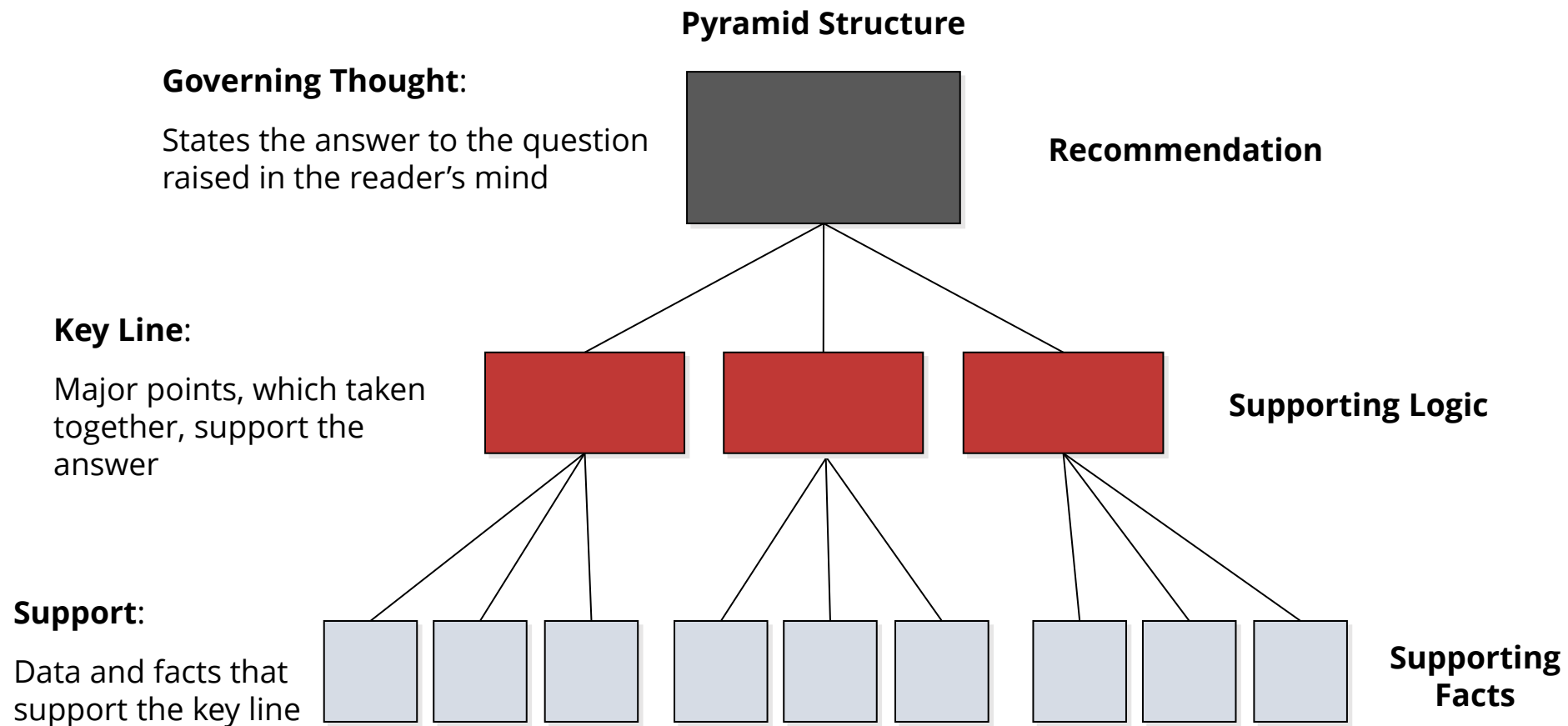
Structure the Activities

The potential solution to an issue is often structured around discrete activities — simply aggregating the results into a pyramid structure does not create a compelling presentation.

```
                    ABC should go online, and their priority
                    should be to defend its current market
                                    share
                   ┌──────────────────┴──────────────────┐
           Opportunities                          Primary potential benefits
       and potential threats                           of the Internet
                                                           strategy
```

ABC's current customers are more likely to shop online than the general population	ABC's competitors are increasing their online product assortment	Without an online channel, ABC risks losing some customers to competitors	ABC's online sales in 2005 could reach $100M

Defend market share	Grow revenue	Develop deeper relationships with customers	Support ABC's operating strategy

The S-C-Q Approach

Use the story elements of situation, complication, and question to set context for your recommendation and engage your reader / listener.

The Situation

- Starting point for your story
- Non-controversial statement
- Triggers the reader to wonder "so what?"

The big game is on television on Sunday.

The Complication

- Follows the situation
- Introduces a challenge
- Should raise a question in the reader's mind (that you will then address)

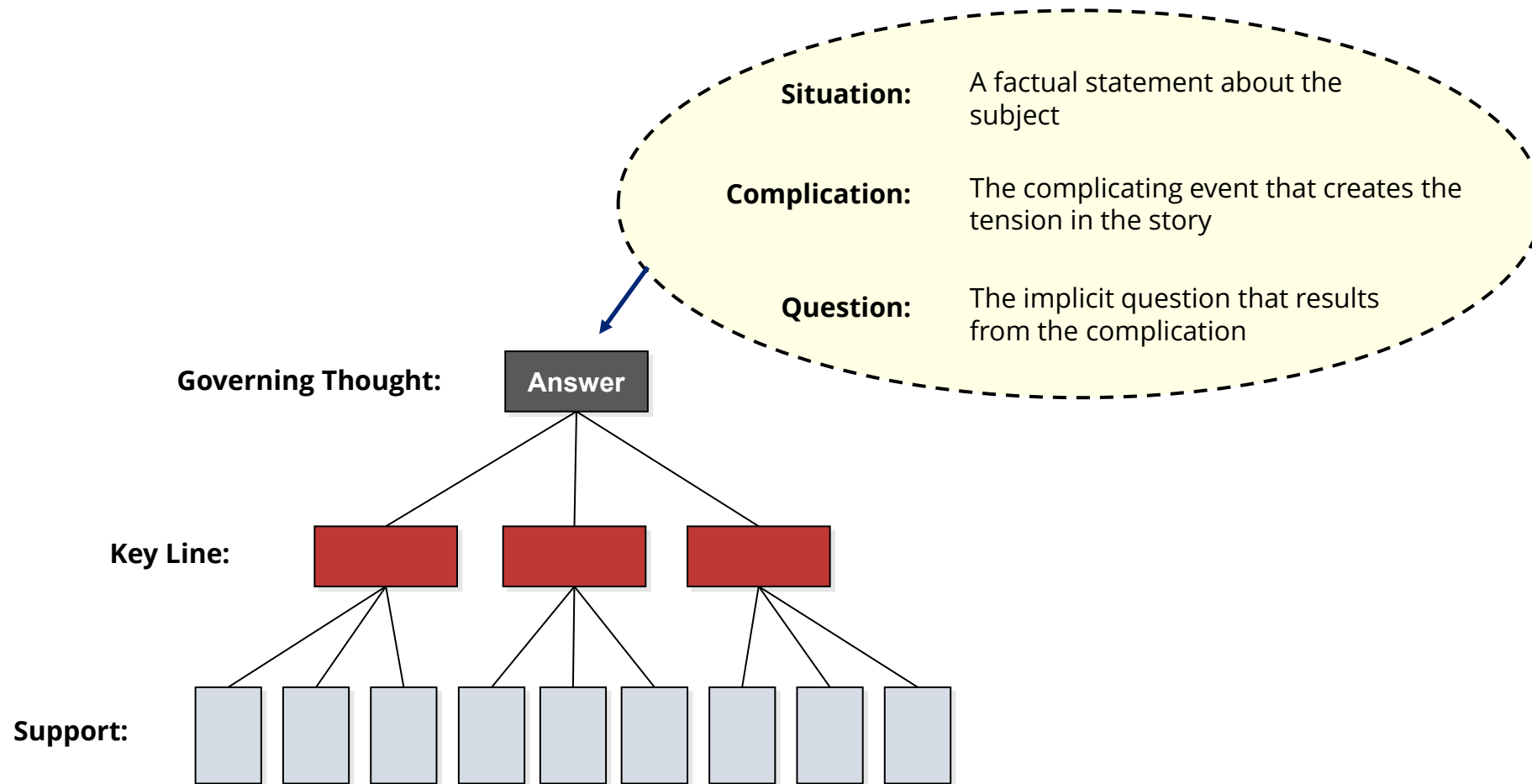I have work and other activities I need to do on Sunday.

Key Questions

- The situation and complication can create questions:
  - What do we do?
  - Is this the right solution?
  - Why not?

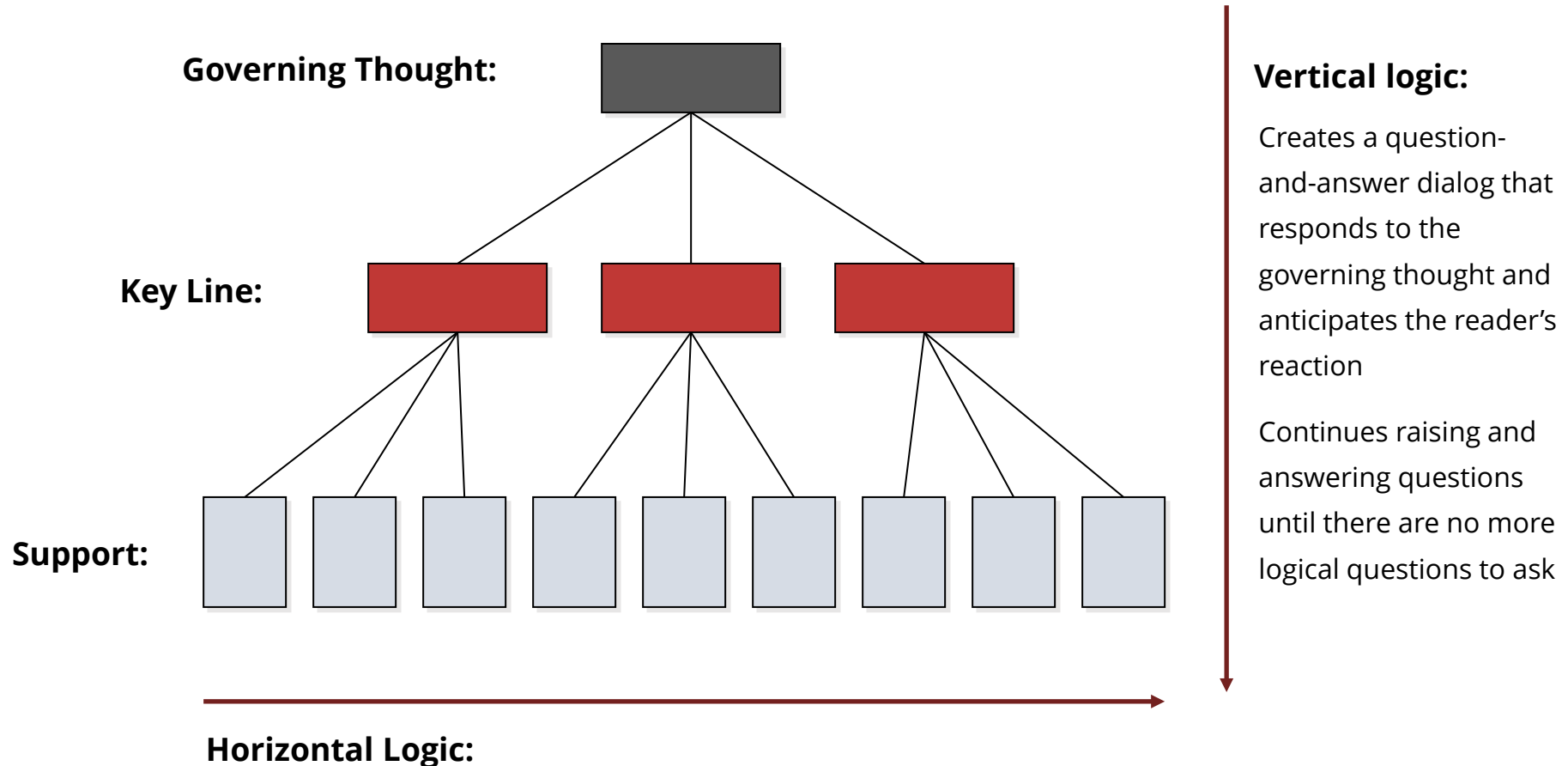How do I prioritize my time on Sunday?

Elements of Introduction

The answer/solution to the question in an "S-C-Q" introduction becomes the pyramid's governing thought.

Situation: A factual statement about the subject

Complication: The complicating event that creates the tension in the story

Question: The implicit question that results from the complication

Governing Thought: Answer

Key Line:

Support:

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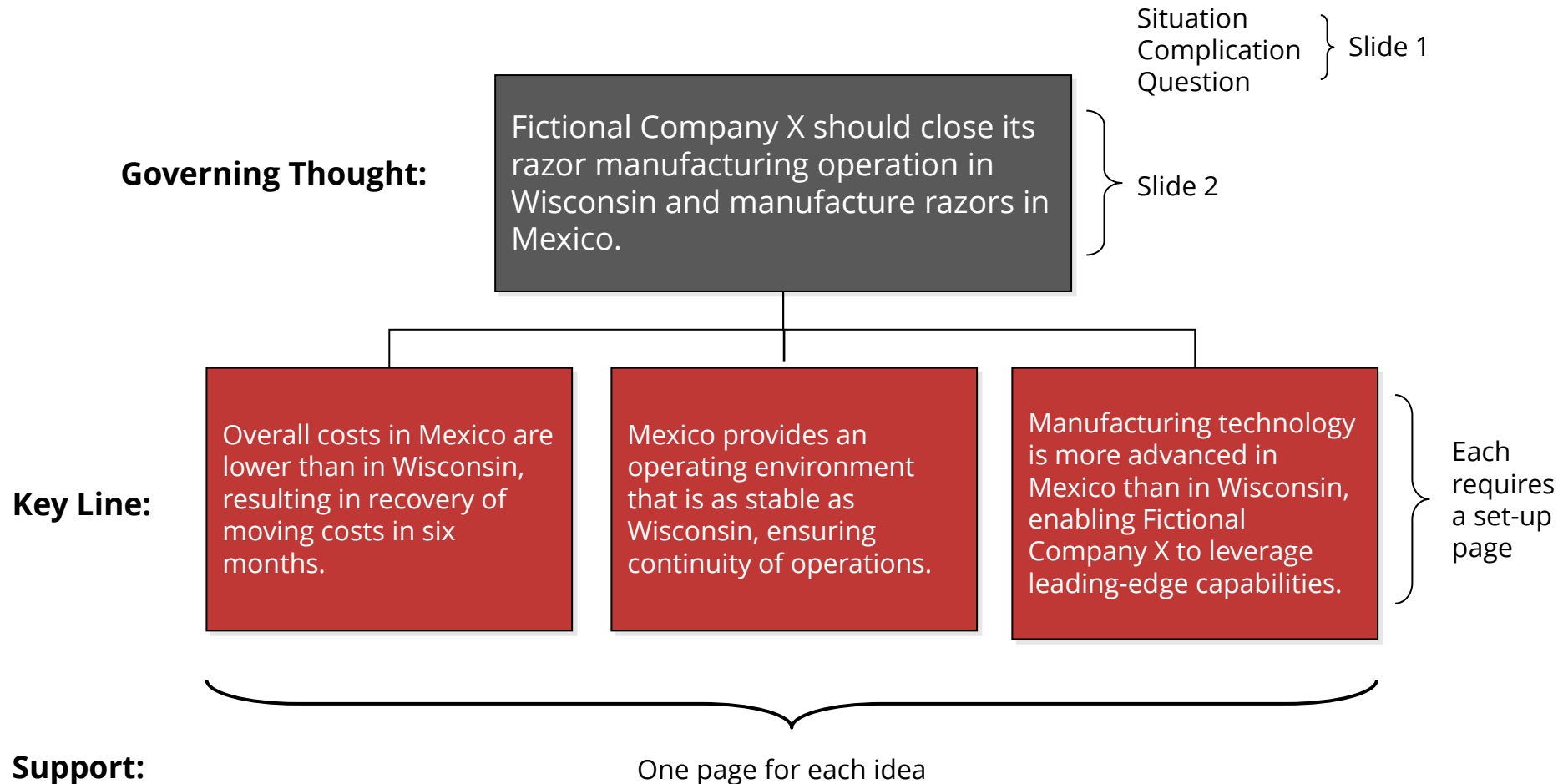
Creating an Effective Storyboard

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A storyboard is a series of slides that serve as a high-level blueprint of your presentation. Your storyboard should incorporate an outline of the slides you will present to the client; it should also capture the structure and flow of your presentation

1. Assemble the introduction

2. Draft the key line

3. Draft the supporting points

4. Scan the headlines to ensure logical flow

5. Outline your plan for each slide

6. Choose a format

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Questions & Survey

Scan me