Human-Computer Interaction

CS 449 | 649 – F26

Week 6: Oct 19 – Oct 23

Stories, scenarios, use cases, storyboards
Design arguments
Creative process

* Updated Oct 19 2026



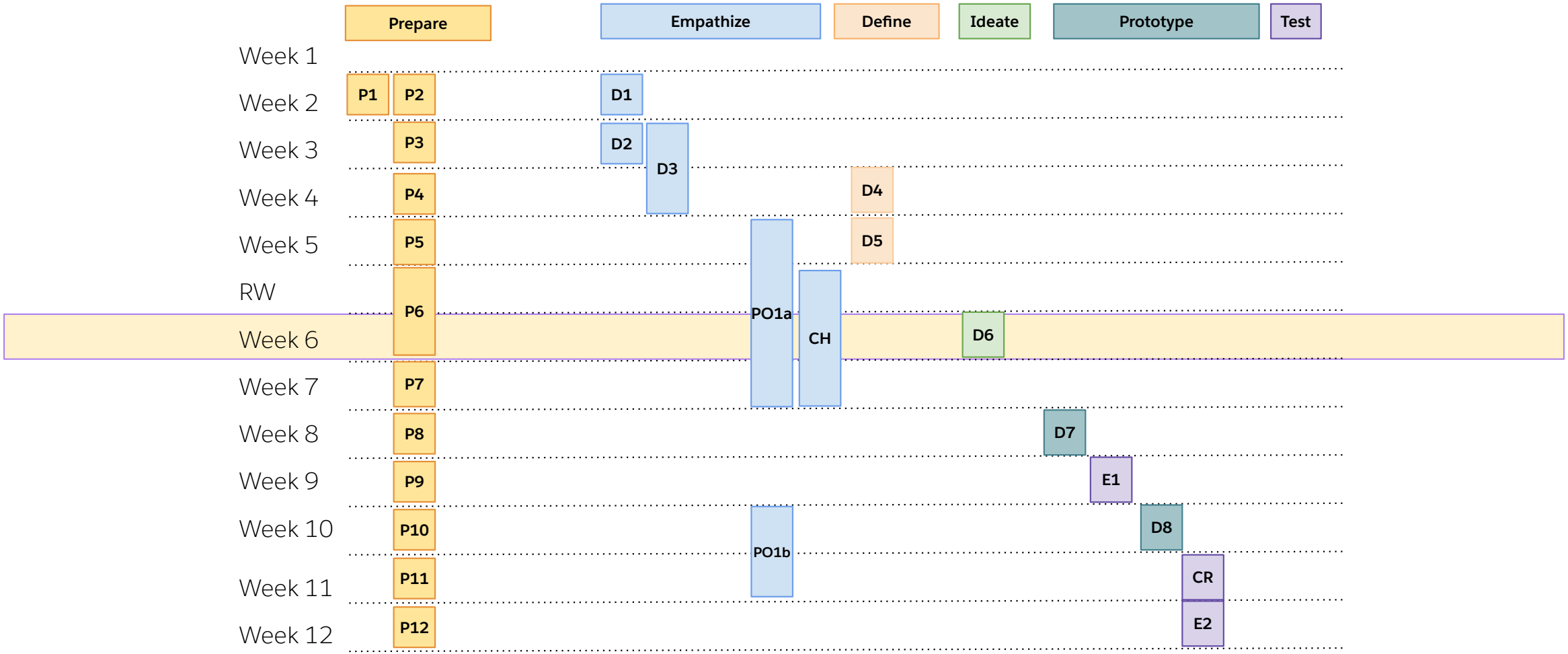
UNIVERSITY OF WATERLOO | DAVID R. CHERITON SCHOOL OF COMPUTER SCIENCE

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Week 5 Recap

Translating needs to functionality, POV and HMW, JTBD + task analysis, Feature ideation + assessment

Project Deliverables Build on Each Other



To-Dos Before Week 6 Studio

✅ Complete design notebook entry for D5: Brainstorm, Challenge and Concretize Features

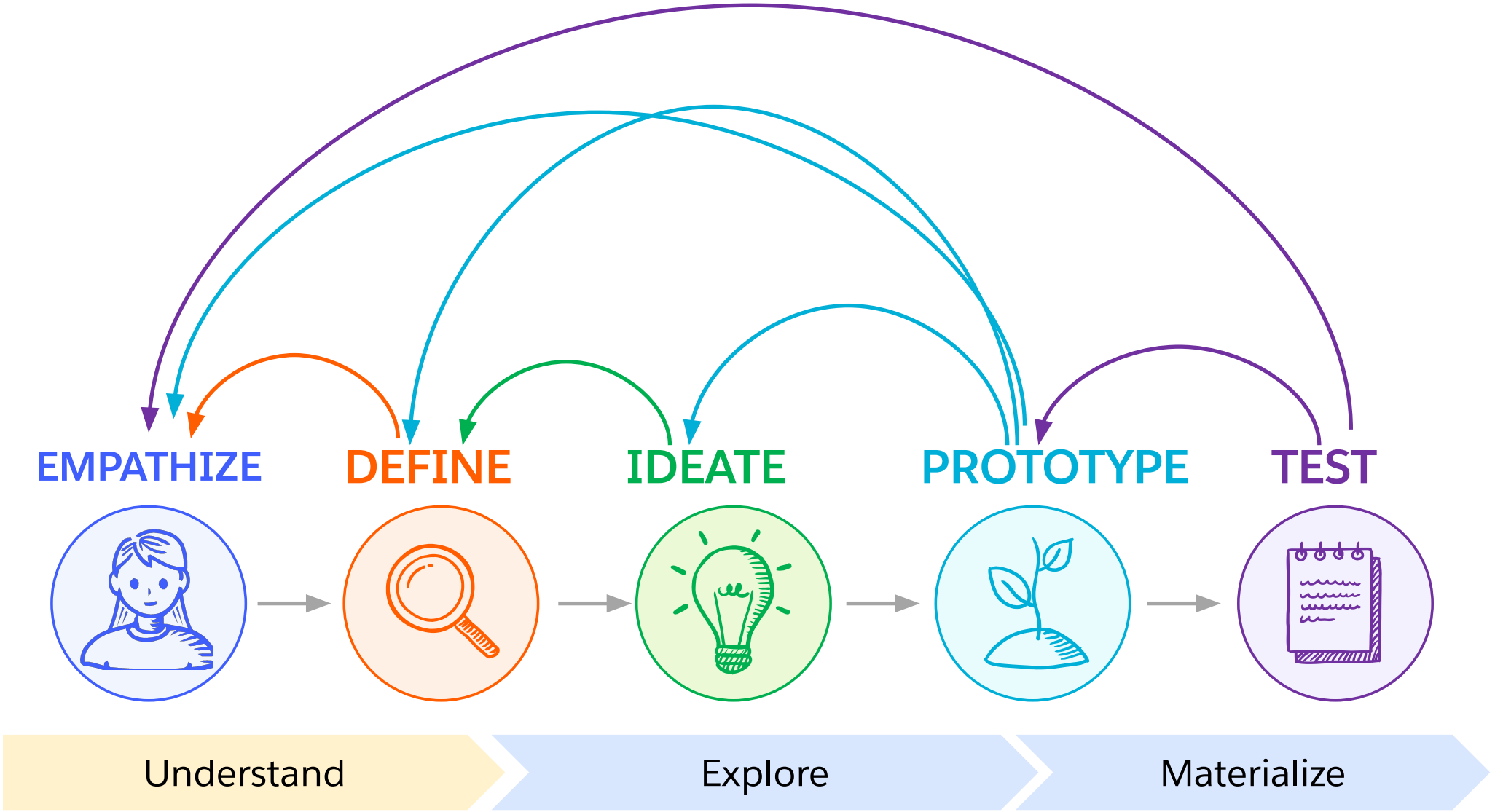
✅ Conduct 2 - 3x PO1a Interviews

✅ Make progress on CH1: your Challenge Report

✅ P6: Prepare for next studio

From Understanding to Designing

From features to stories, scenarios, use cases, and storyboards

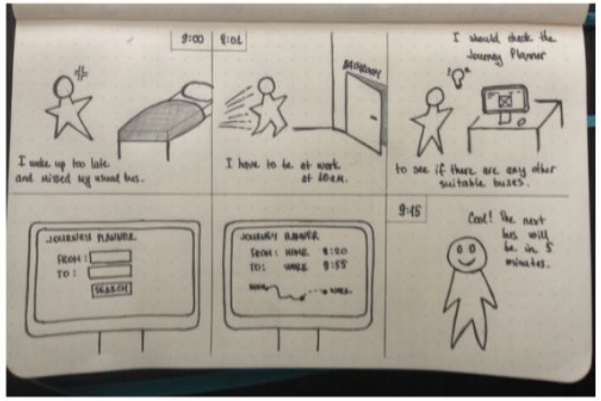

EMPATHIZE
DEFINE
IDEATE
PROTOTYPE
TEST
Understand
Explore
Materialize

Where are we heading?

User stories / Storyboard

- description of a feature from an end-user perspective

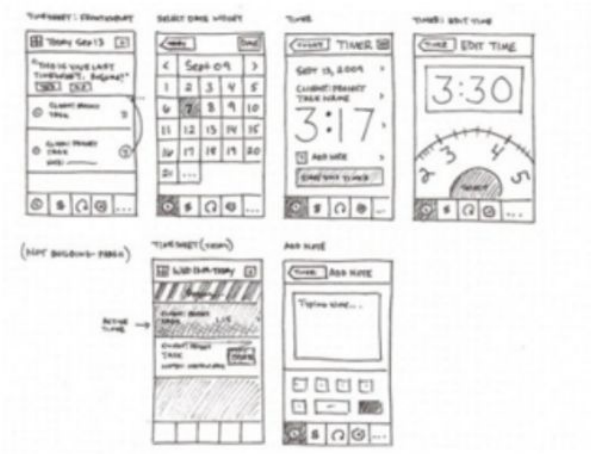
As a user / <persona> ,
I want / need <action>
so that I can <user goal>.



https://digitalflask.com/blog/ux-storyboarding-introduction/

Sketches

- illustration of how the basic concept works

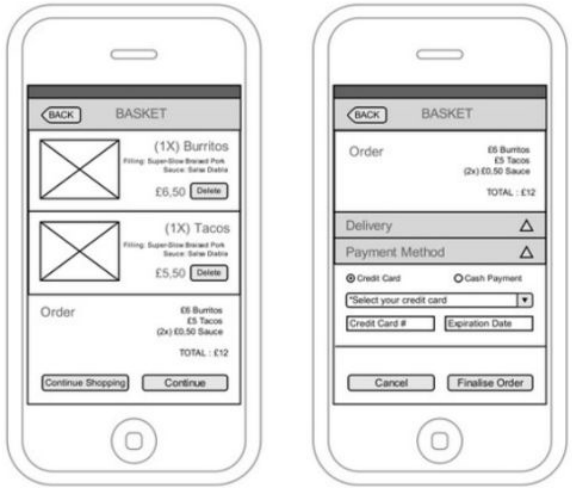


The idea translated into user interface form.

http://uxmovement.com/wireframes/why-its-important-to-sketch-before-you-wireframe/

Wireframes

- static representation of the UI layout and user flow



https://www.behance.net/gallery/13421913/Wireframes-Restaurant-App

Understanding A Person's Interaction with a System

Artifact	Focus	Detail Level	Used For	Connects to...
Story	Person's Goal	Low	Backlog items, Agile planning	Starting point for others
Scenario	Context + behavior	Medium	Empathy, experience design	Elaborates on stories
Use Case	Functional interaction	High	Requirements & test cases	Formal version of stories/scenarios
Storyboard	Visual flow	Variable	Communication, prototyping	Visualizes any of the above

Stories & Epics

Epics → Stories → Tasks

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Stories

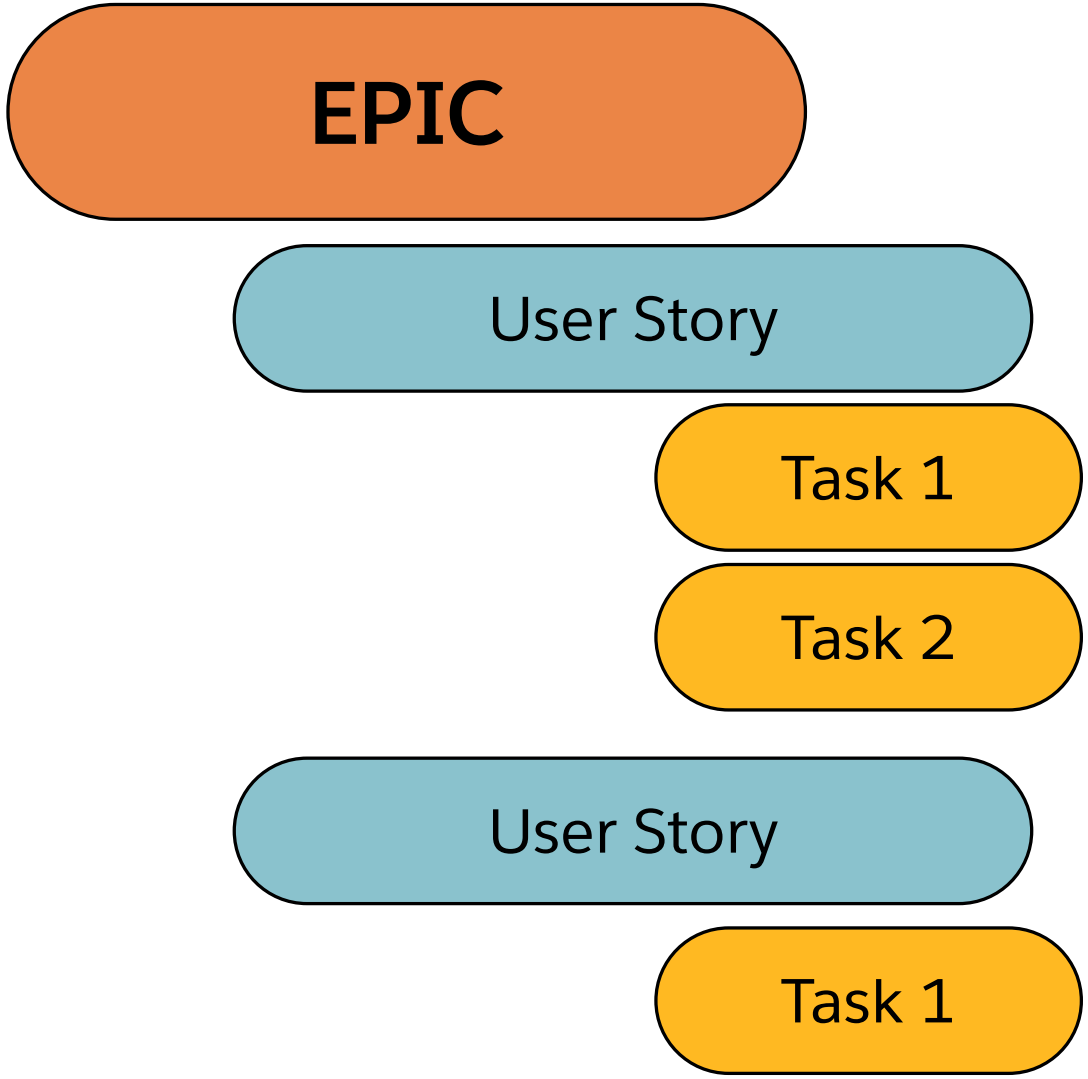
A story is a high-level, informal description of a feature from an end-user perspective., focuses on **who** wants **what** and **why** ...

... a technique from agile software development, organizes **stories** into **epics**

Epic = A book title

Stories = Chapters

Tasks = Sentences/paragraphs.



📖 Kerstin Exner: What Is An Agile Epic? Best Practices, Template & Example (2026)

Stories

A human-focused system requirement: what someone needs to get done, from that their point of view … Not a functional or technical specification…

… Intentionally brief and simplified …encourages creativity and discussion:

who	As a <*person*>,
what	I want to <*perform some action*>
why	so I can <*achieve some goal*>.

📖 Patrick Joseph Downs: User stories vs use cases: how they stack up (2020)

An Epic and its Stories

Epic: a large, more general story … a story is generally one sprint of work

Online Event System

epic

> **As an** event organizer, **I want a** comprehensive online system to manage event registrations, **so I can** streamline the process and gather attendee information efficiently.

Attendee Registration

story

> **As a** potential attendee, **I want to** easily register for an event online by filling out a form, **so I can** secure my spot quickly.

Payment Processing for Registration

story

> **As a** registered attendee, **I want to** securely pay for my event ticket using a credit card, **so I can** complete my registration without hassle.

Producing Stories

1: Start with the goal of a persona

2: Transform the goal into an epic

3: Identify specific interaction challenges or features/ideas for the epic

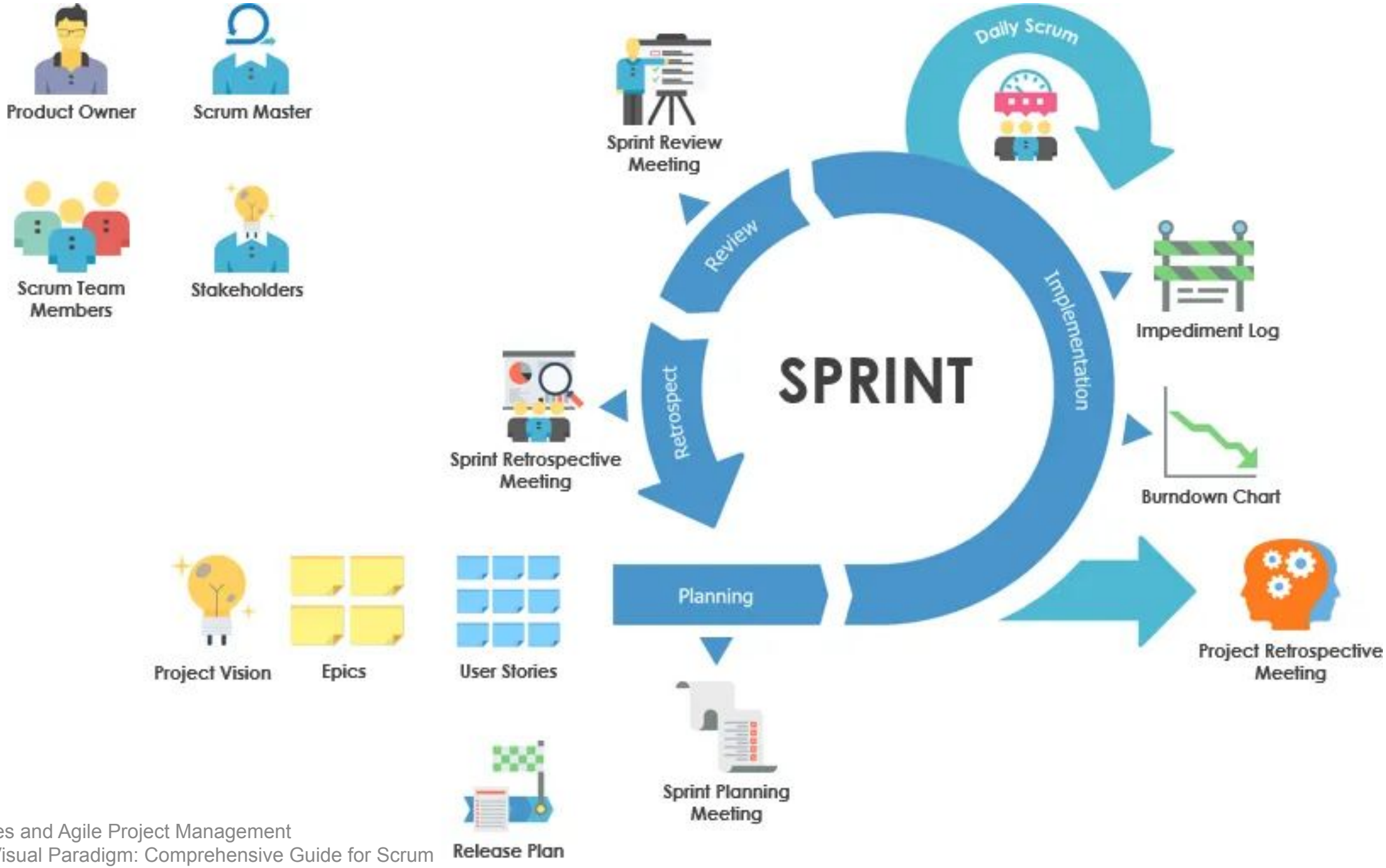
4: Generate stories for the epic that describe these challenges or features

5: Discuss your epic and stories with your team

6: Refine your epic and stories

7: Repeat until the stories stabilize

📖 Caroline Jane: How to write meaningful user stories (2019)



Stories and Agile Project Management

📖 Visual Paradigm: Comprehensive Guide for Scrum

Scenarios

Connecting stories to context and experience

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Scenarios

A descriptive story to capture a person's context and experience as they work to achieve a specific goal ...

... can capture current behaviour or how they might use a new product

... helps understand how they might interact with your product

... useful to generate ideas for the product design

... an effective communication tool for stakeholders

📖 Justinmind.com: How to design user scenarios: best practices and examples (2024)

Scenarios

There are different types of user scenarios:

goal-based scenarios state only what a person wants to do ...

elaborated scenarios give more story details ...

full scale task scenarios include the steps to accomplish the task ...

📖 Justinmind.com: How to design user scenarios: best practices and examples (2024)

Scenario Components

Scenarios are short narratives that contain:

Background: who is the scenario about? … what do they know? / their skill set?

Motivations: what goals do they want to achieve?

Tasks: what specific steps must they do to reach those goals?

Context of Use: how will they encounter your design?

Environment: where will they try to use it?

Challenges: points of stress or friction when working towards the goal

Example Scenario

background | motivation | tasks | context

Sheryl is a Marketing Manager in Las Vegas, and she has a business trip coming up in Northern California. The trip is half pleasure and half work, and she wants to do some hiking in the mountain trails. She knows the roads can be pretty bumpy, so she wants to rent a car that is suitable for off-road driving. ***Sheryl discovers our website to find the perfect car.*** *She is unfamiliar with these types of vehicles, so she compares some models and reads the reviews to get a better idea of her best option. When she finds one she likes in the budget allotted by her company, she books it.*

📖 Justinmind.com: How to design user scenarios: best practices and examples (2024)

Use Cases

A sequence of steps toward a goal

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Use Cases

A formal description of how a person interacts with a system to accomplish a goal ... shown as sequence of simple steps, beginning with a goal and ending when that goal is fulfilled.

Preconditions: conditions for the use case to be valid
Actor: a person performing an action on/within the system
Trigger: an event causes the use case to be initiated
Standard Flow: a typical (and successful) use case.
Alternate Flow: variations when something goes wrong
Stakeholder: someone with vested interest in the system

📖 Jenna Erickson: Smart UX: Use Cases

Use Case Example: Laundry

Precondition: on Wednesday

Actor: Housekeeper

Trigger: Dirty laundry is transported to the laundry room

Standard flow: On Wednesdays, the housekeeper reports to the laundry room. They sort the laundry that is there. They wash each load. They dry each load. They fold the items that need folding. They throws away any laundry item that is irrevocably shrunken, soiled, or scorched.

Alternative flow: If they notice that something is wrinkled, they iron it and hang it up using a hanger.

Use Case as a Diagram

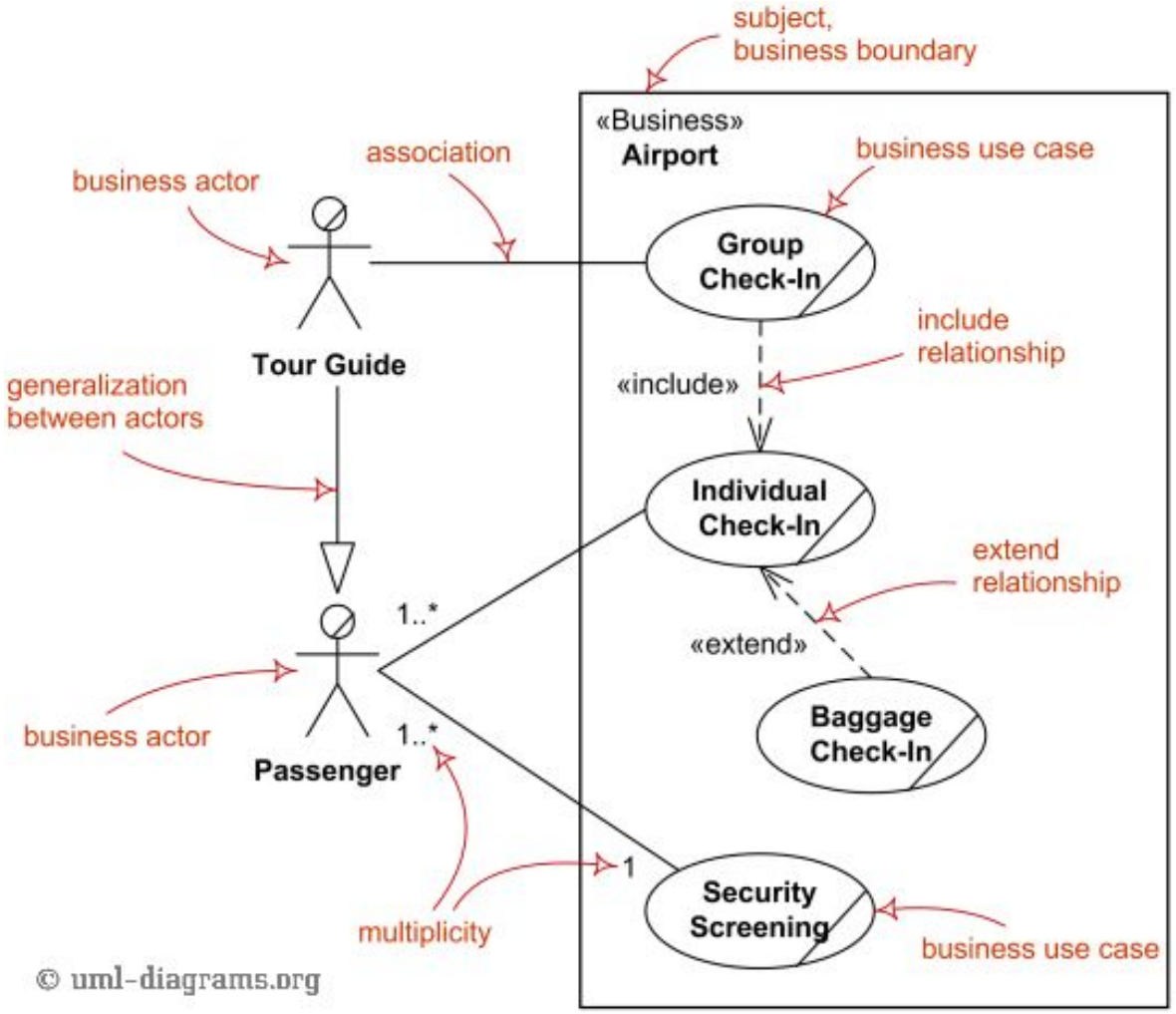
UML description of system functionality - not internal system design!

Actors (Stick figures) - person or other software

Use Cases (Ovals) - functionality provided / unit of work

System Boundary (Rectangle)

Relationships (Lines): associations, inclusions and exclusions



📖 Marcus Hoang: UX design process (2017)

Storyboards

Pre-visualizing an interaction sequence

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Storyboards

Communicates a story through images displayed in a sequence of panels that chronologically maps the story's main events.

Main purpose is to "**pre-visualize**" an interaction sequence
... originally developed by Disney to previsualize animated films

Usually used in the earliest stage of the design process
... essentially a very low fidelity prototype
... should be fast to generate and refine

Main goal of early-stage storyboarding is to understand context of use

📖 Nikita Verkhoshintcev: UX Storyboarding the Introduction (2016)

Creating a Storyboard

1. **Gather** your data
   ... personas, empathy maps, affinity diagrams, etc.

2. **Define** the basics
   ... name the "starring" persona and the specific scenario you will depict

3. **Plan** out steps
   ... write out story steps and connect them with arrows
   ... label emotional state at key steps (e.g. frustrated, happy, bored, ...)

4. **Create** visuals for panels and add captions
   ... professional looking drawings not important, stick figures are fine
   ... hand-drawn usually better than an illustration tool like Figma
   ...show user interface, but keep it simple and conceptual

📖 Rachel Krause (Nielsen Norman Group): Storyboards Help Visualize UX Ideas (2018)

Storyboard Elements

Specific Scenario or Story

... the protagonist is stated and shown in the storyboard

Visuals

... a time-ordered sequence of graphical images (called "panels")
... only one path to reach a goal per storyboard (it's not a flow chart)
... drawings can be simple stick figures, illustrations, photos, or a mix
... should portray details important to the story:
environment, speech bubbles, simple sketch of an interface

Captions

... concise descriptions of a panel
... an action, environment, device, emotional state

The 3S of Storyboarding

Setting

... who is involved?
... what is the environment?

Sequence

... what steps are involved?
... what task is being illustrated?

Satisfaction

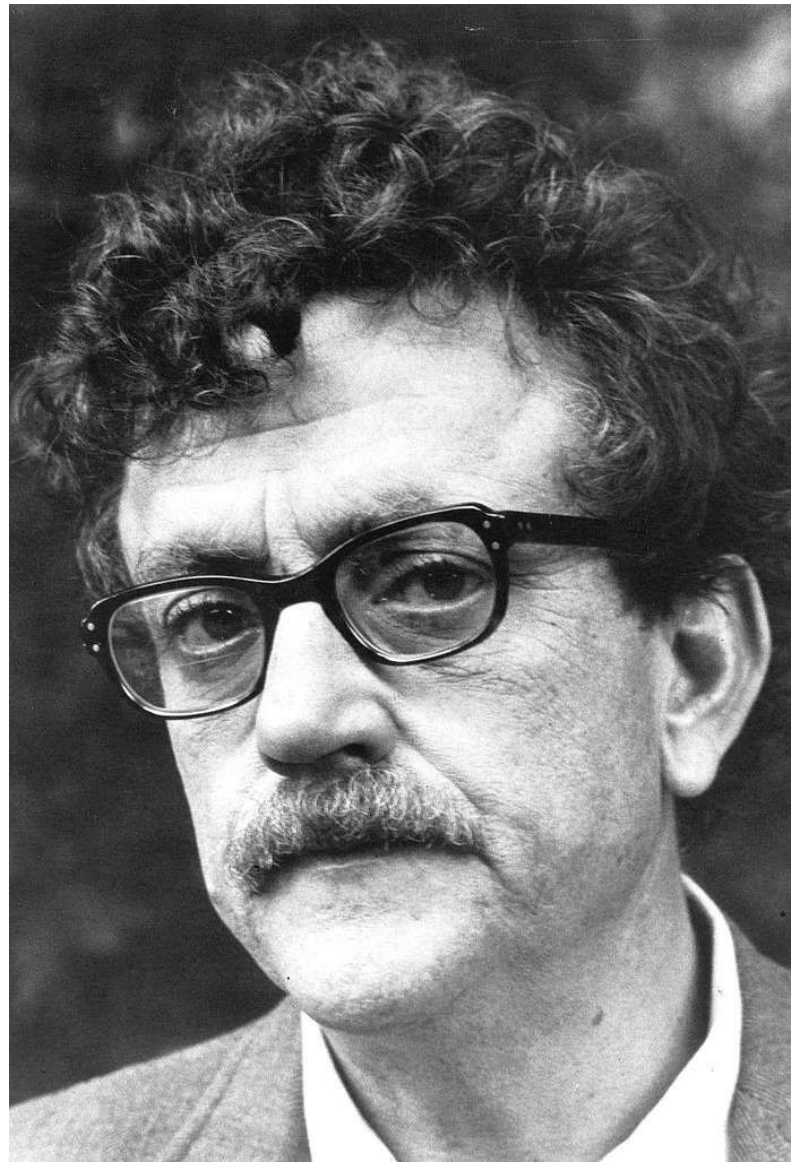
... what's the protagonist's motivation?
... what's the end result?
... how do they feel?
... what needs are being satisfied?

"When I used to teach creative writing, I would tell the students to ***make their characters want something right away – even if it's only a glass of water****."*

... "Characters paralyzed by the meaninglessness of modern life still have to drink water from time to time."

– Kurt Vonnegut (1982)

Palm Sunday: An Autobiographical Collage



Storyboard Tips and Strategies

First think about your **ending** in the last panel:
... what's the outcome assuming everything goes well?

Then create the **starting** panels: panel 1 establishes where and when the story occurs
... introduce your protagonist and their goal/problem in panels 1 – 2

Now work forward from establishing panels and backwards from last panel
... fill in the rest of the story at the right level of detail

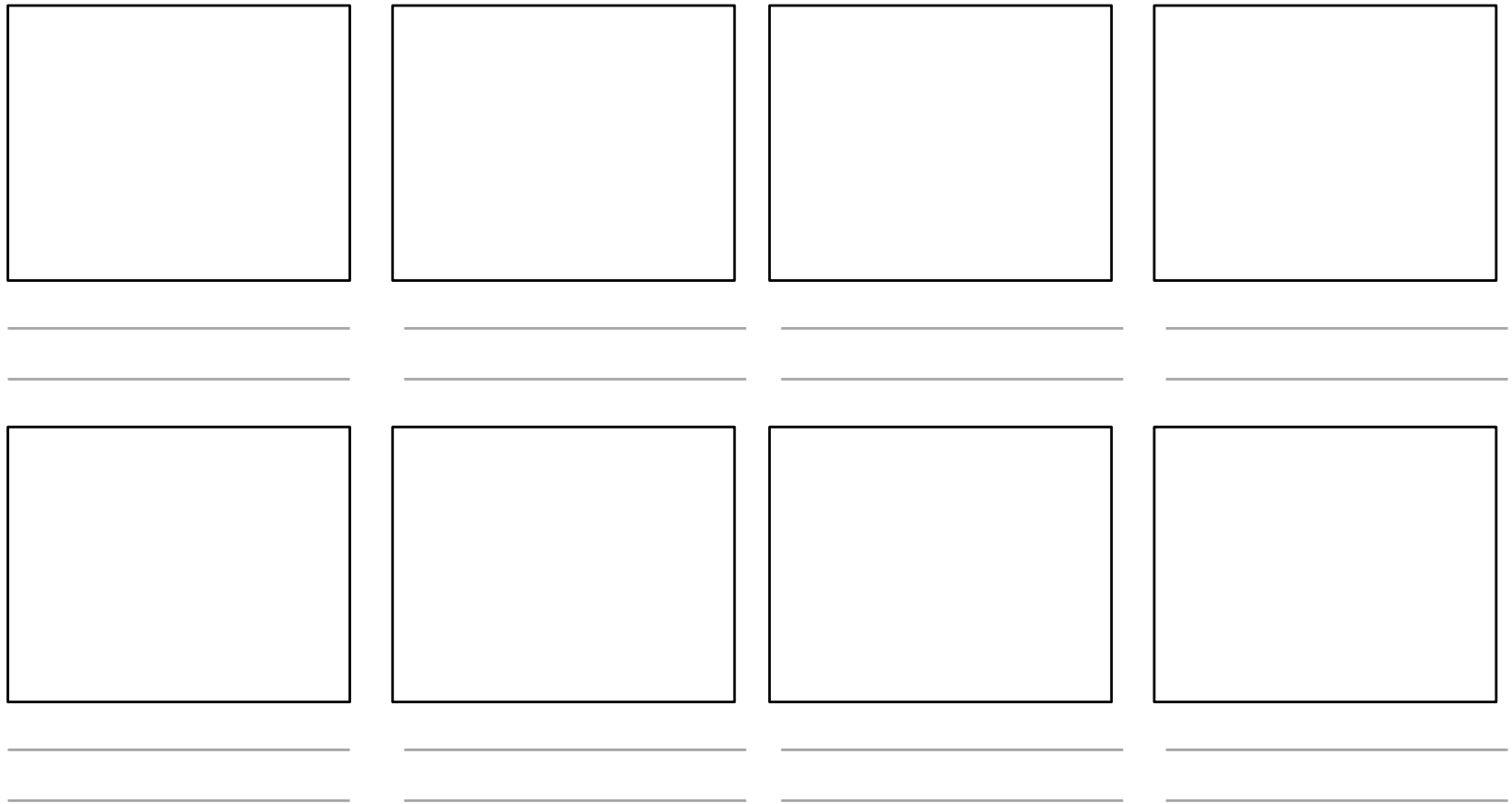
Start with rough drafts, then make a final copy

Critique and **revise**: is it clear? realistic? convincing? motivates core idea?

Make your story powerful: focus on authentic details and emotions

Storyboard Length: 6 – 12 Panels

... less than 6 suggests the scenario is too simple or too high level
... more than 12 suggests the scenario is too complex or too low level
... start with 8 and add or subtract a few panels as needed



STORYBOARD

PERSONA:

CORPORATE BUYER, JAMES

SCENARIO:

REPLENISH OFFICE SUPPLIES







- MAKES NOTE OF SUPPLIES NEEDED ON CLIPBOARD
- PHYSICAL INVENTORY

- SELECTS ITEMS FROM FAVORITES LIST
- USES DESKTOP ↓ SUPPLY LIST AS TOOL

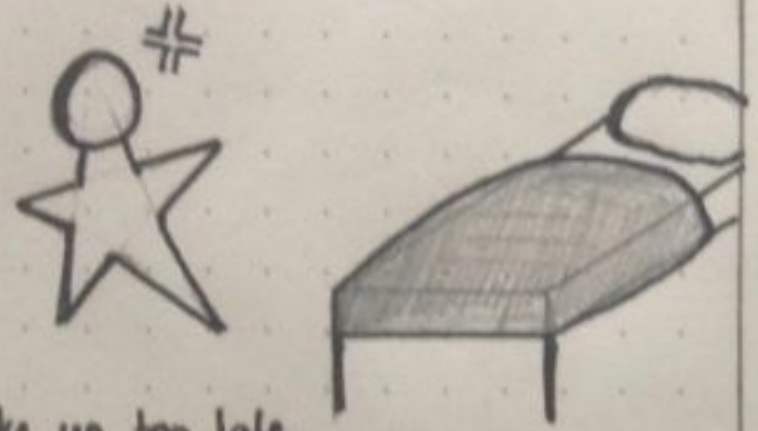
- RECEIVES SHIPMENT WINDOW W/ORDER SUBMISSION
- SETS PLAN FOR RESTOCK

📖 Rachel Krause (Nielsen Norman Group): Storyboards Help Visualize UX Ideas (2018)

Storyboard Critique

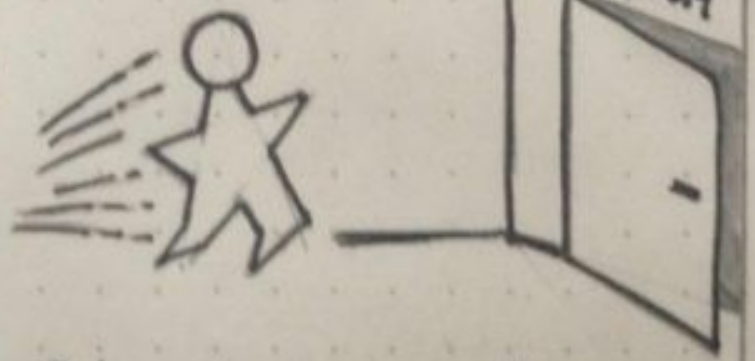
What works well and what could be improved

9:00



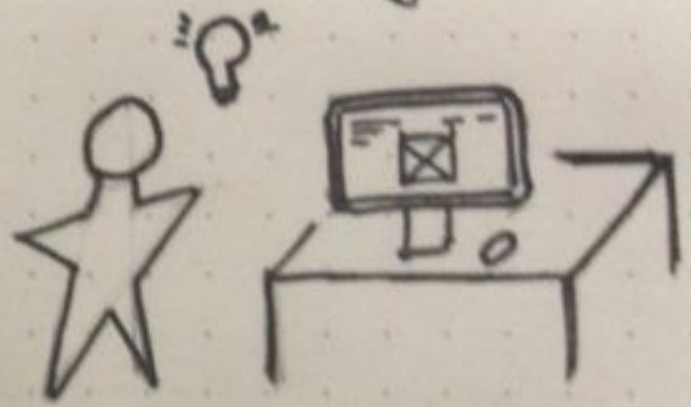
I woke up too late and missed my usual bus.

9:01

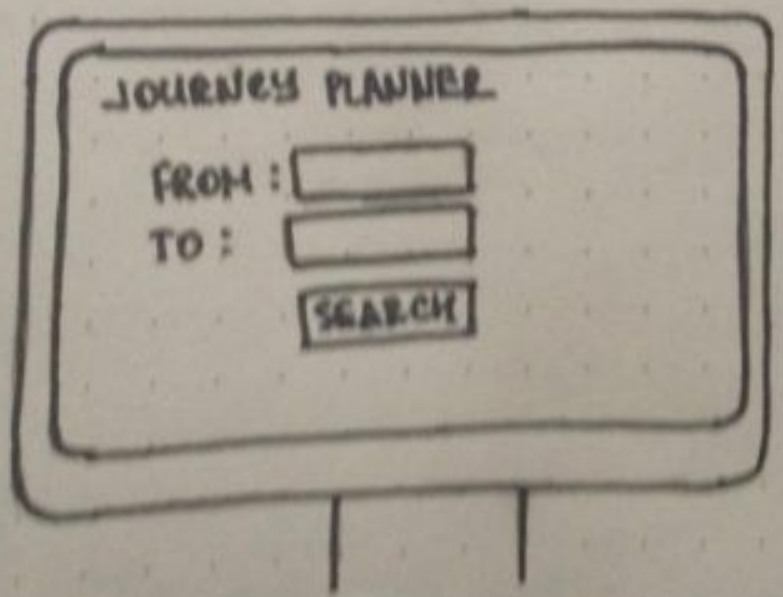


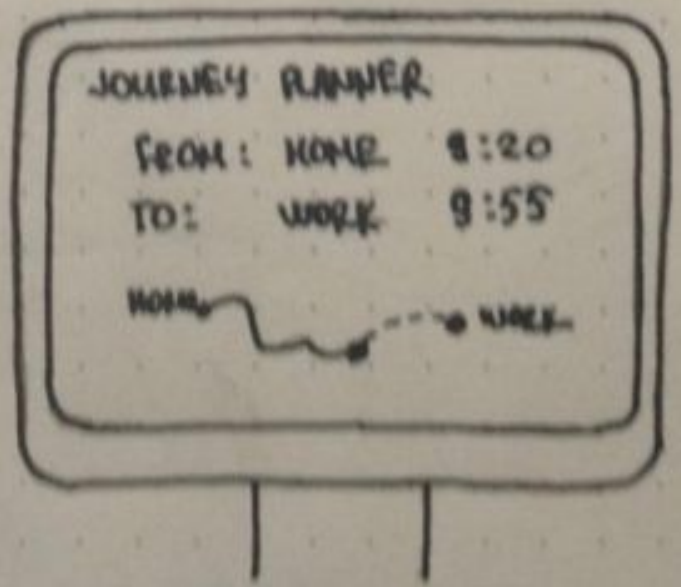
I have to be at work at 10a.m.

I should check the Journey Planner



to see if there are any other suitable buses.





9:15



Cool! The next bus will be in 5 minutes.

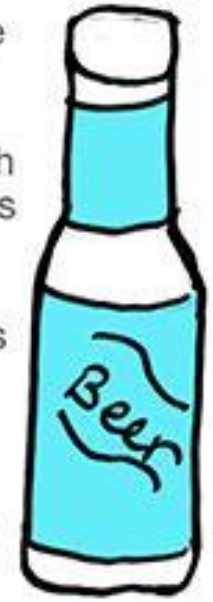


Zach is going to a sports bar and wants to have some beer with friends.



But he was diagnosed with a gluten allergy. He can drink some low-gluten beers.

The bar where Zach and his friends are going to watch the game does not serve gluten-free beer. He hates that stuff anyways.









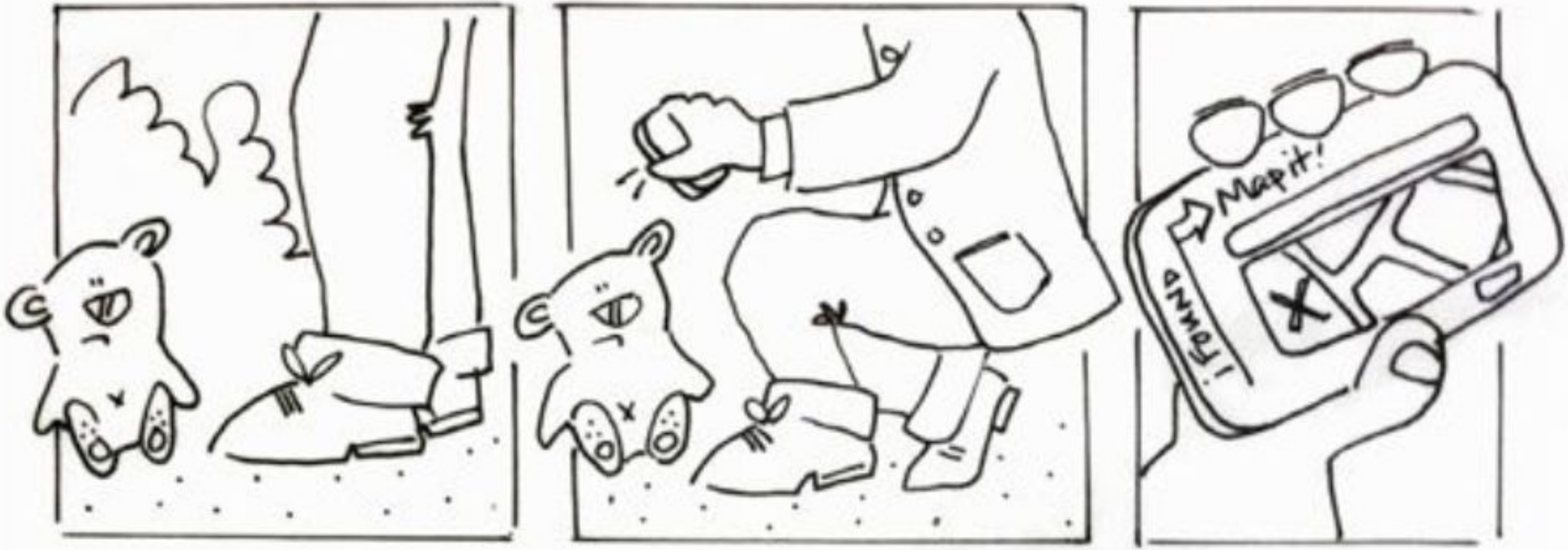
He discovers that Corona is low in gluten and the bar serves this beer.



Yes! He is happy because now he can have beer with his friends while he is watching the game.



Zach orders the lower-gluten beer from the bar and enjoys the day with his friends.



On a walk through the park, Marco stumbles across a teddy bear fallen on the side of the path.

Realizing it must be lost, he uses his mobile phone to photograph it where he found it, and takes the bear home.

Once home, Marco uploads the photo to iFound®. The MapIt! function uses the GPS from the photo to record where the bear was found.



As soon as the iFound® match list is generated, Marco sees a photo of the very same bear he has just found. He immediately contacts the finder and they arrange a way to get the bear back to its owner.



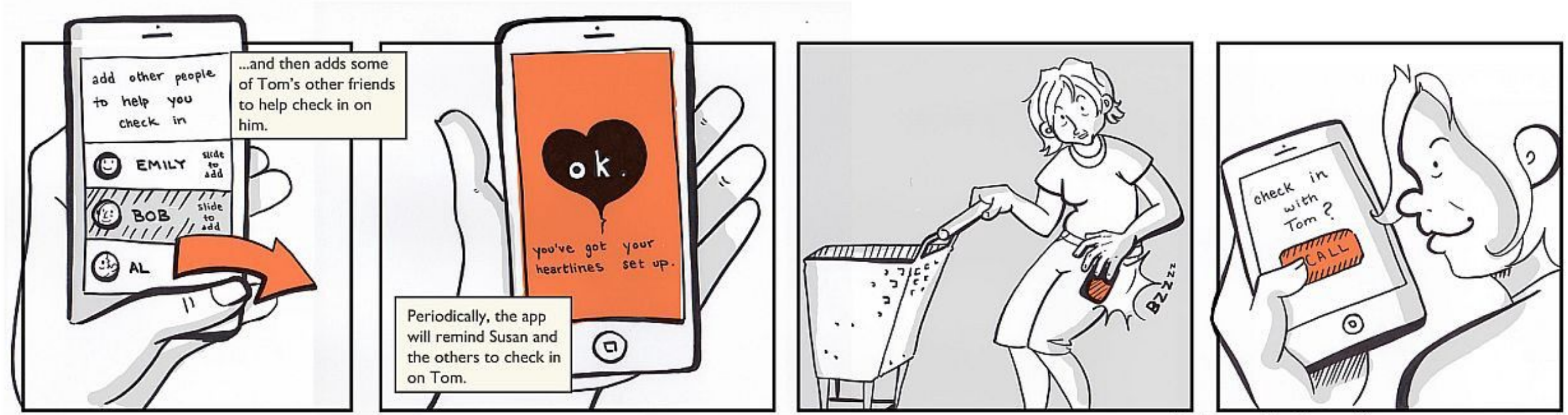
The teddy bear is handed off to a very relieved mom.



When it is recorded that the bear has made it safely home, Marco receives a 'thank you' email from iFound®, offering him a choice of coupons for anything form ice cream to flowers. Marco's choice provides useful information to corporate sponsors.



📖 Nick Babich: Storyboarding in UX Design (2017)



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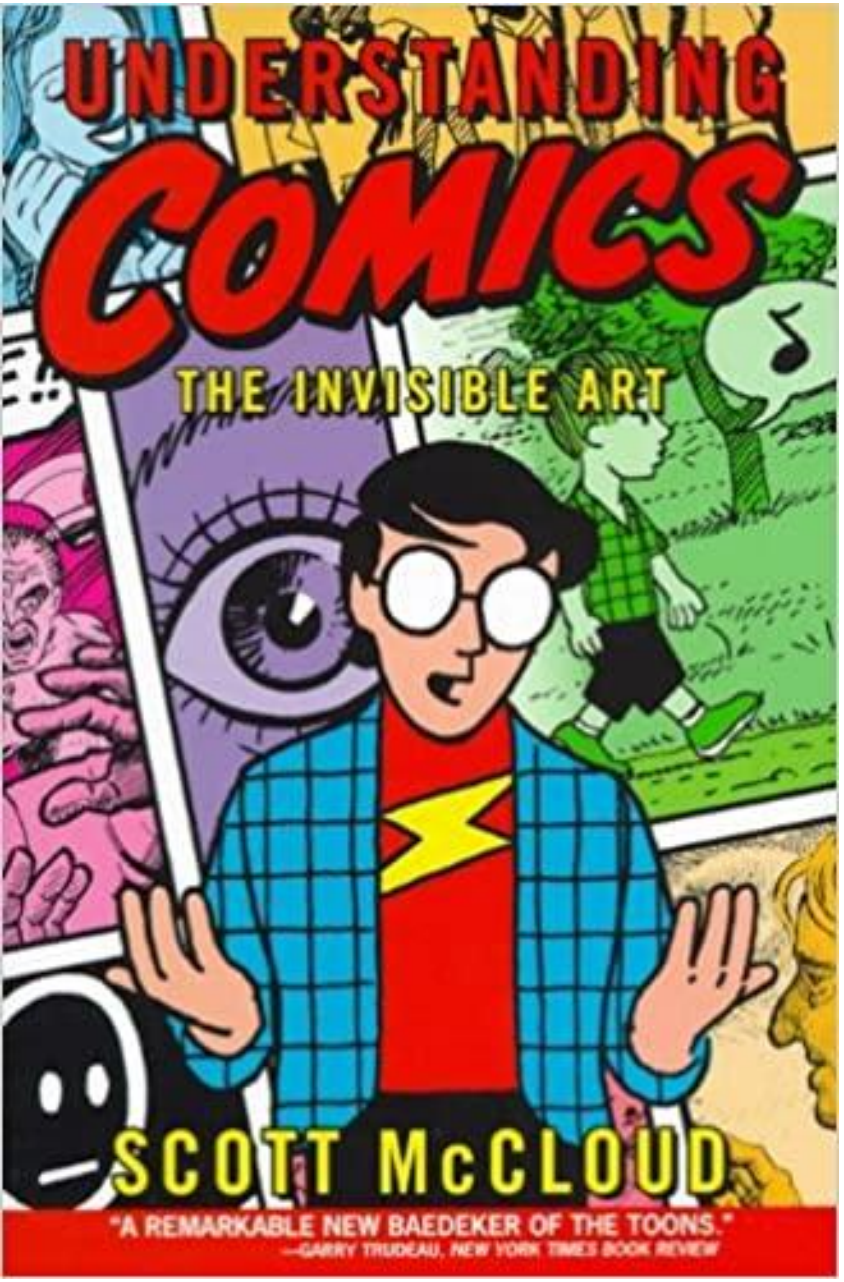
📖 Nick Babich: Storyboarding in UX Design (2017)

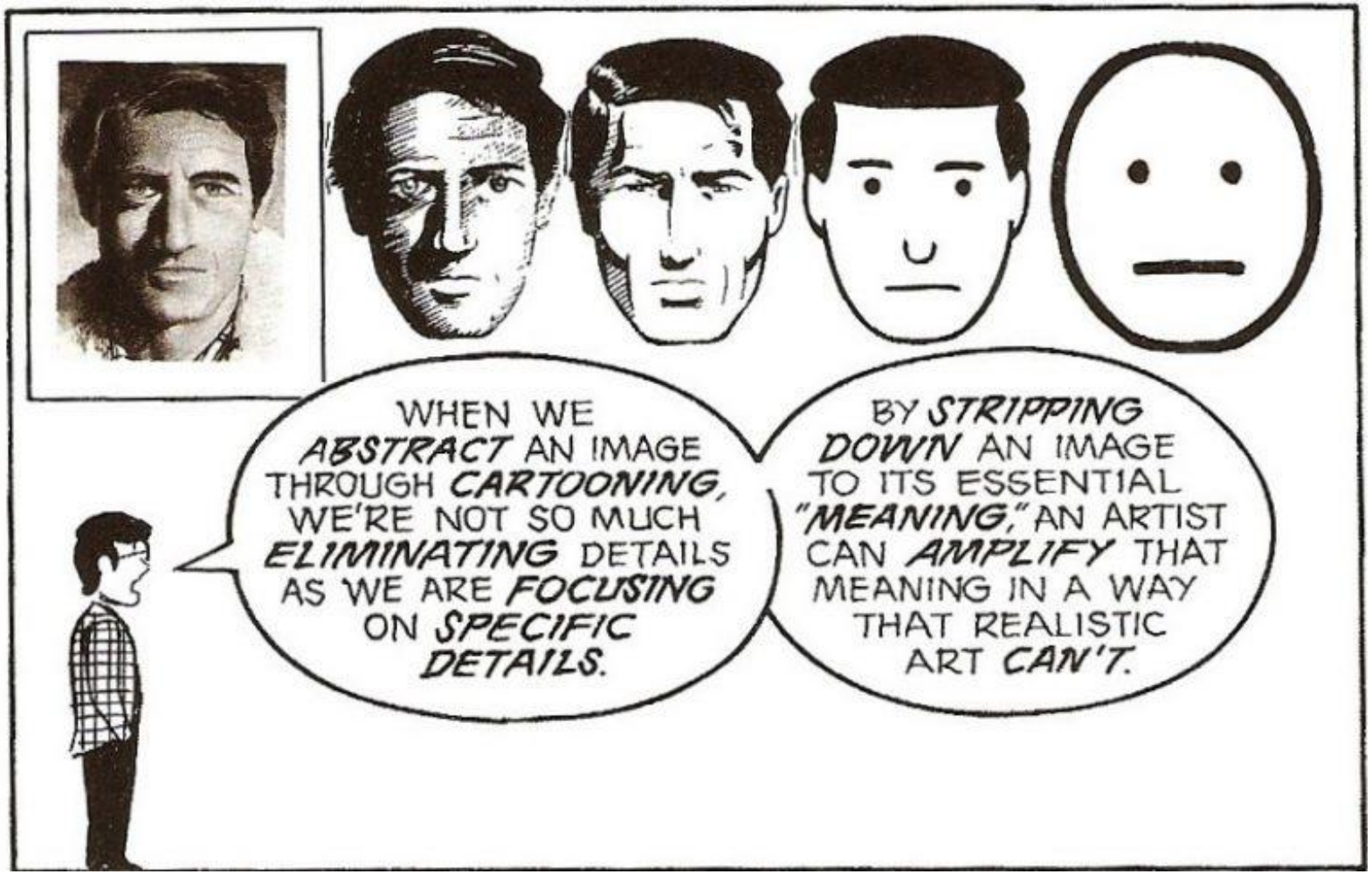


📖 Ian Loew: 4 of the Best UI Storyboard Examples for 2025 (2023)

Storyboards beyond UX

Comics and Film





📖 Scott McCloud: *Understanding Comics: The Invisible Art* (1993)

Jodorowsky's *Dune*

c. 1970s, a film never made ...

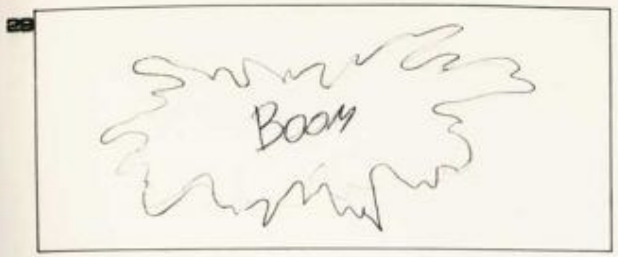
... beautiful and imaginative storyboards ...

... significant influence on future films, games, comics ...

Star Wars (1977 –)
Alien (1979 –)
The Fifth Element (1997)
Blade Runner (1982, 2017)



29



30



HAWATI : " SABOTAGE HARKONNEN ! "
LETO : " APPELEZ LES VEILLEURS ! DESCENDEZ ! "

HAWATI : " HARKONNEN SABOTAGE ! "
LETO : " CALL THE WATCHMEN ! GET GET DOWN ! "

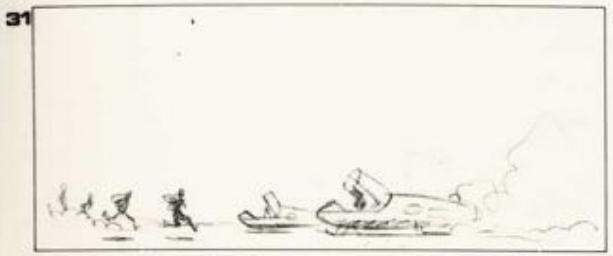
31



LE GUETTEUR ATTERRIT...

THE WATCHMEN LAND...

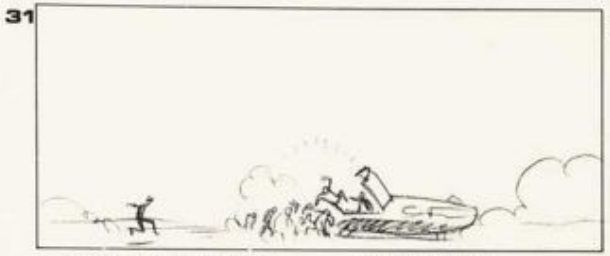
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...LES CHERCHEURS D'EPICE SE PRECIPITENT VERS EUX...

... THE SPICE-SEATCHERS RUN FOR THEM...

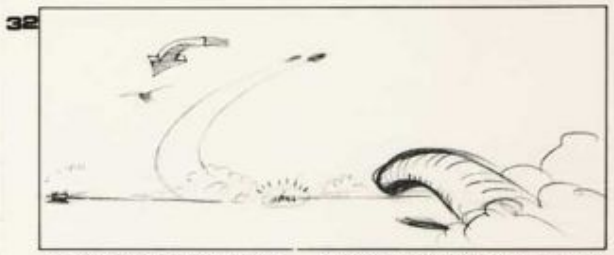
31



...ET SE BATTENT POUR ENTRER

... AND FIGHT TO GET IN

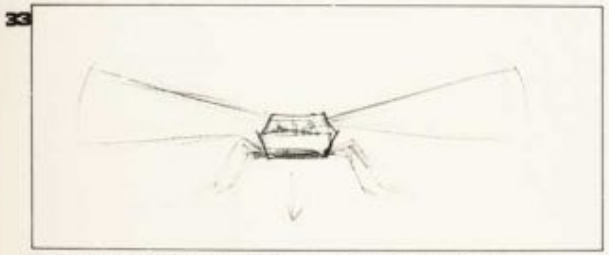
32



LE GUETTEUR DECOLLE ABANDONNANT DES HOMMES - L'ORNI DESCEND

THE WATCHMEN TAKE OFF, LEAVING SOME MEN - ORNI COMES DOWN

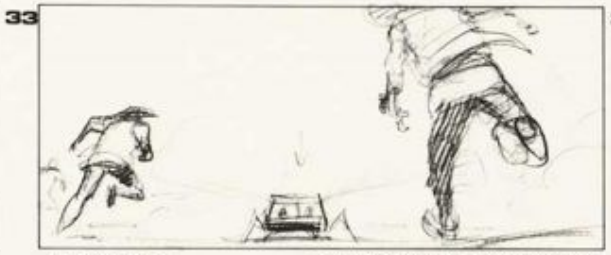
33



L'ORNI ATTERRIT - LA CAMERA LE SUIT

ORNI LANDS - HE PAN DOWN WITH IT...

33



IL TOUCHE LE SOL
LES HOMMES SE PRECIPITENT

...IT TOUCHES DOWN - THE MEN RUN FOR IT

34



LE VER PLONGE_
HAWATI : " NOUS NE POURRONS JAMAIS REDECOLLER ! "

THE WORM DIVES.
HAWATI : " WE'LL NEVER TAKE OFF ! "

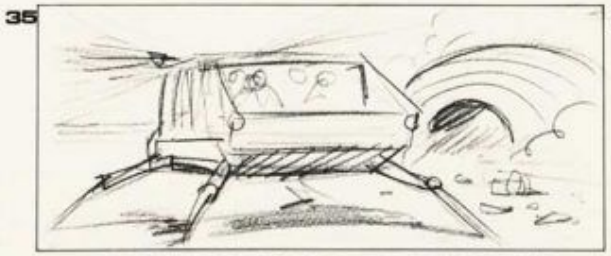
35



IL JETTE LES POIDS INUTILES

THEY THROW OUT EXCESS WEIGHT...

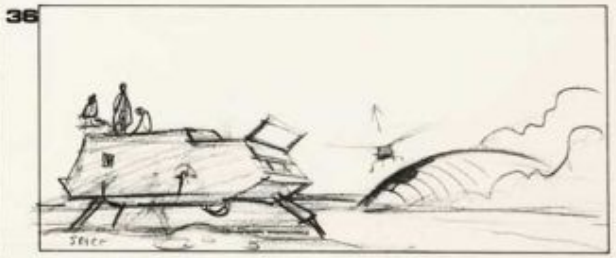
35



...ET ENTRENT PENDANT QUE LE VER ARRIVE

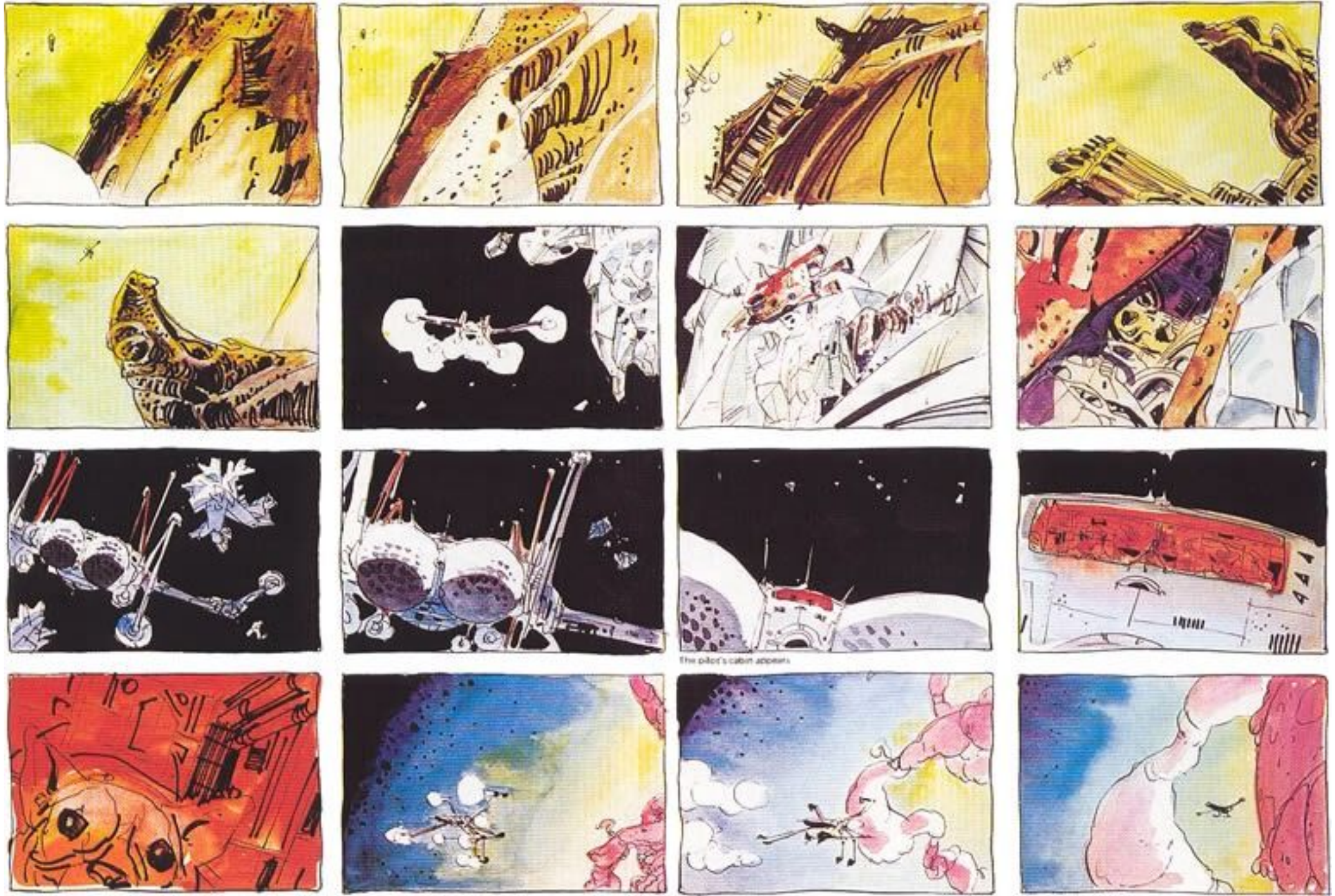
... AND GET IN AS THE WORM ARRIVES

36



ILSDECOLLENT A TEMPS
2 FREMENS RESTENT

TAKING OFF JUST IN TIME -
2 FREMENS REMAIN



Design Arguments

Reason for why a design may work... A framework for analyzing, selecting, and evaluating ideas

What is a Design Argument?

A framework for analyzing, selecting, and evaluating ideas

Stories, scenarios, use cases, and storyboards provide the “proof” and the “story” for why a particular design decision makes sense

... **Stories** are the “what” and “why” (The core need)
... **Scenarios** provide the “context” and “motivation”
... **Use cases** act as the “System Interaction Details” or the “Functional Scope”
... **Storyboards** are the “Visual Journey” and “Emotional Impact”

From Design Problem to Design Argument



Users

Who are your users?

What are they trying to do? (Tasks / Goals)



Obstacles

What are their challenges?

What's preventing them from achieving their goals?

Why is the problem important?



Outcomes

What should users be able to do?

What should happen when they do it?



Ideas / Experiments

What solutions will work?

What characteristics of the idea will help a user overcome the obstacle to achieve the desired outcome?

Design Problem

Design Argument

The Design Problem



Users

Who are your users?

What are they trying to do? (Tasks / Goals)



Obstacles

What are their challenges?

What's preventing them from achieving their goals?

Why is the problem important?

Users and **obstacles** capture the tensions between what people want to be able to do and what is standing in the way of them achieving their goals.

As a **<user>**
I want to **<object task>**
but **<obstacle>**

Note the parallels to the **story**

The Design Argument

Defines how **characteristics** of the solution will help people overcome and **obstacle** to reach a desired **outcome**



Obstacles

What are their challenges?

What's preventing them from achieving their goals?

Why is the problem important?



Outcomes

What should users be able to do?

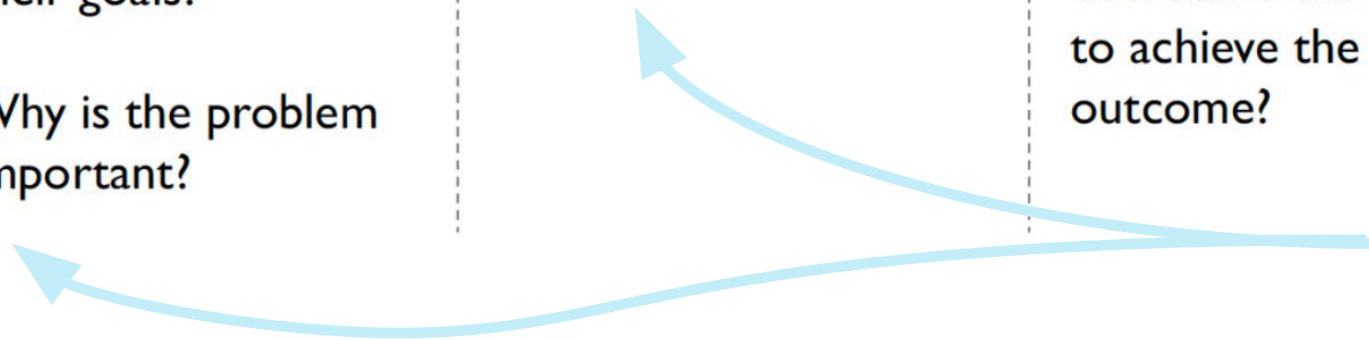
What should happen when they do it?



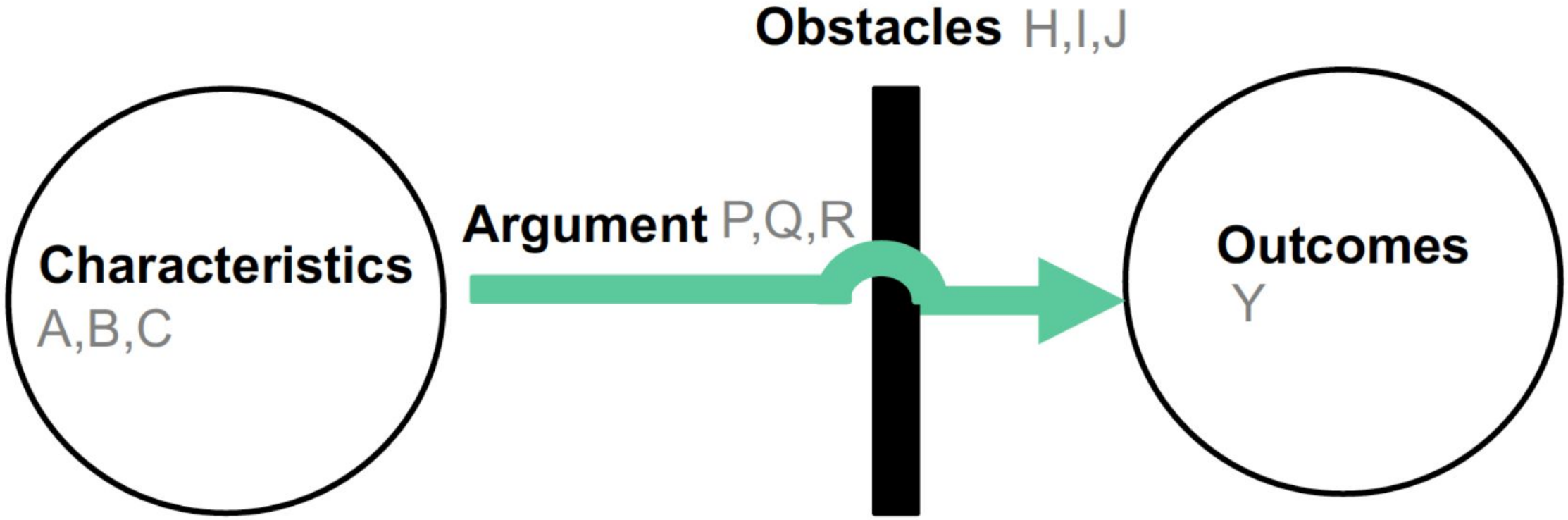
Ideas / Experiments

What solutions will work?

What characteristics of the idea will help a user overcome the obstacle to achieve the desired outcome?



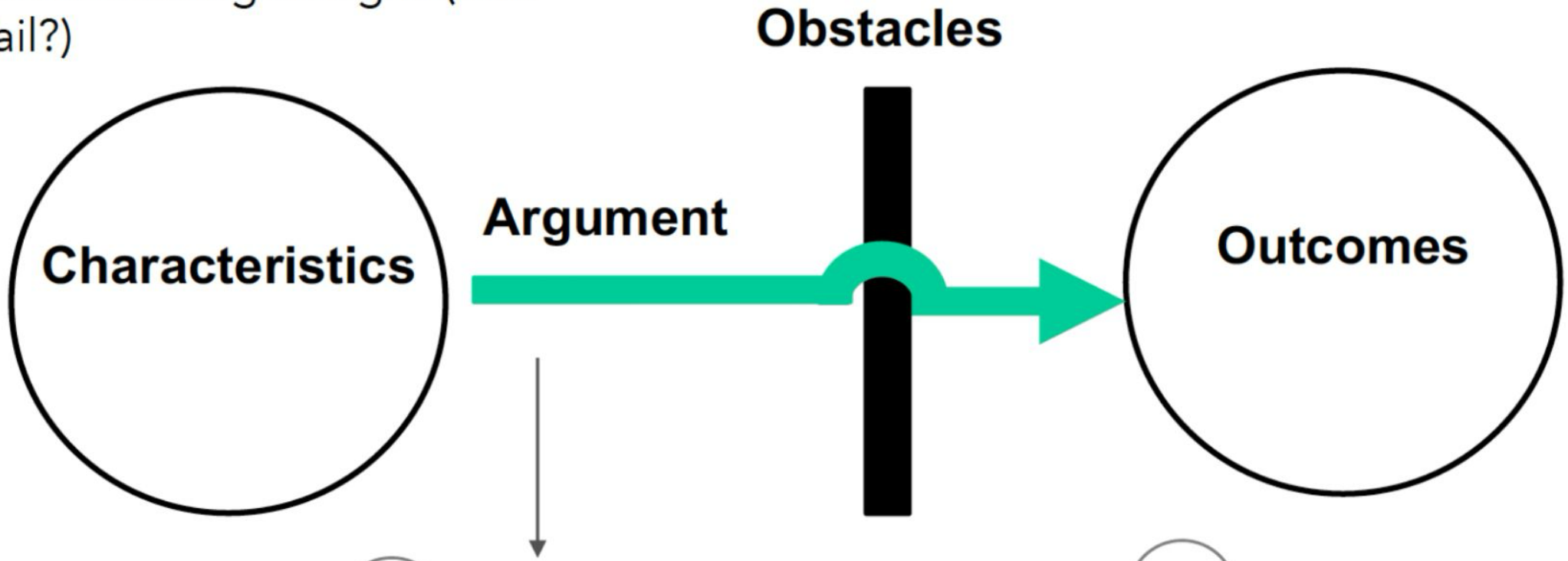
The Design Argument



If you want to achieve outcome Y to address a specific need,
... aim to design an intervention with characteristics A, B, C
... that observe the obstacles H, I, J
... because of arguments P, Q, and R

3 What are characteristics of the core design proposal? How are they different from other existing designs (that fail?)

2 What gets in the way of users achieving their goal? Why do current designs fail?



4 Why will it work? How do these characteristics, overcome the obstacles to reach the desired outcome?

1 What should users be able to do? What happens when they do it?

iPhone Design Argument

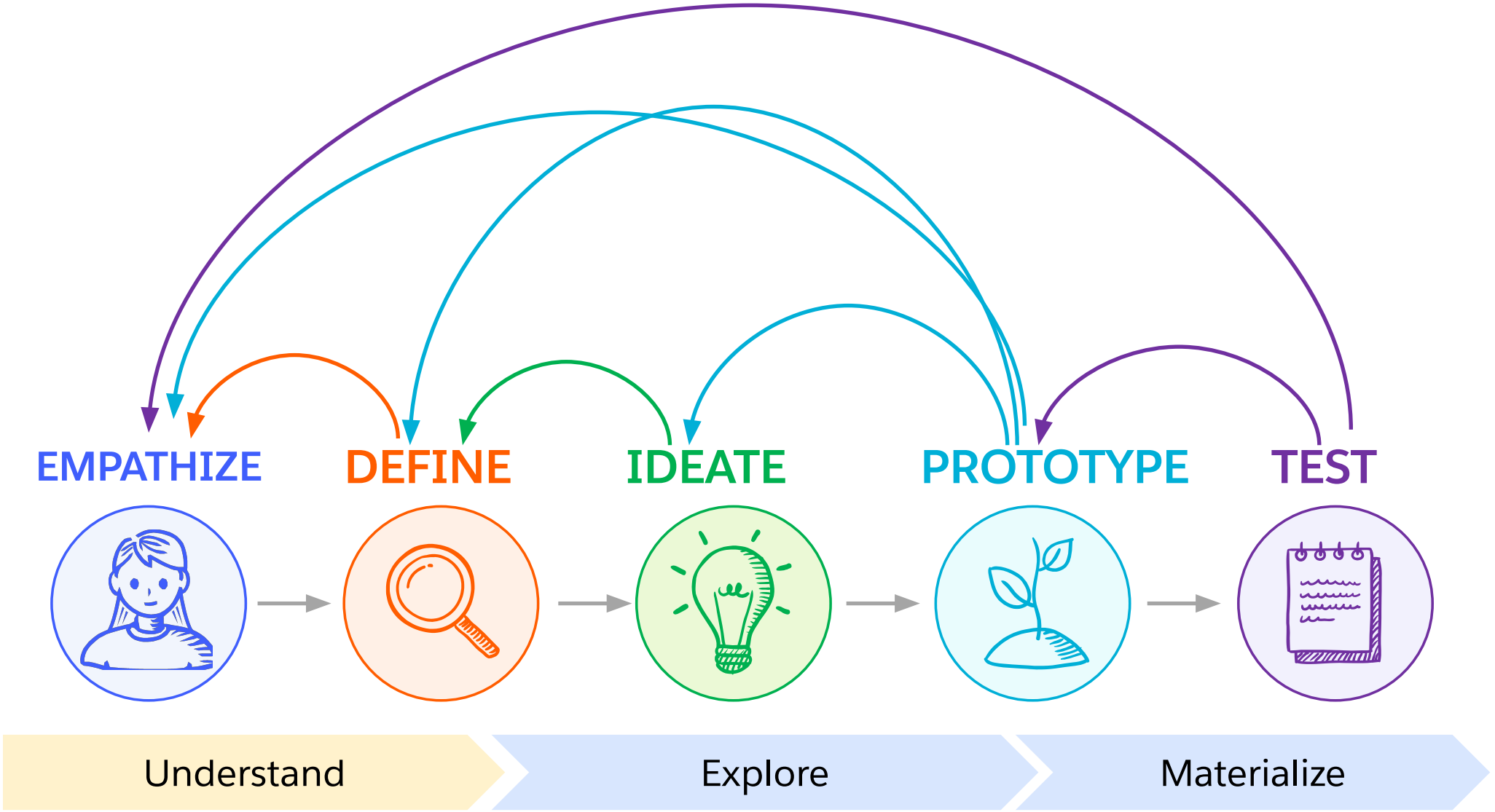
If we want to help someone achieve some **outcome Y**, then we should design an intervention with **characteristics A, B, C** that overcome **obstacles H, I, J** because of **arguments P, Q, R**

Example

> If we want a phone to easy to use, then we should enable fingers as the input device to overcome the need for a stylus because fingers is a natural pointing device and people won't lose them!

The Creative Process

A five-stage model


EMPATHIZE
DEFINE
IDEATE
PROTOTYPE
TEST
Understand
Explore
Materialize

5 Stages of the Creative Process

Preparation

- research
- Consume
- immerse
- gather



Incubation



- explore
- experiment
- synthesize

Illumination



Aha!

Evaluation



- Reflect
- Criticize
- Assess

Implementation



- work
- work
- work

📖 Interaction Design Foundation: What are the Stages of Creativity? (2026)

Preparation



All the work you did in the understanding stage!

Define the constraints

... Goals, parameters of the challenge, resources, time

... We defined many of these for you in the course!

Gather knowledge and understanding around the challenge

... Draw from both academic and informal sources

... A lack of understanding often leads to worthless ideas

Challenge all the assumptions

... Make sure you are solving the right problem

📖 Interaction Design Foundation: What are the Stages of Creativity? (2026)

Incubation



Nurture you unconscious thought process, let ideas sit with you

Take a step back ...

... allow your mind to wander to let it contemplate the problem,
... thoroughly study over the resources you have collected,
... take a walk (or bike, or swim)

Most ideas formed subconsciously

Open your mind to all ideas...

... even the crazy ones ... evaluation stifles creativity,
... an idea that seem crazy could become a seed of a great solution

📖 Interaction Design Foundation: What are the Stages of Creativity? (2026)

Illumination “Eureka Moment”



A solution to a problem "suddenly" surfaces to the conscious level

Different ideas might kind of fit, then something finally works!

Usually difficult to explain how you thought of such an idea

Always write ideas down in the moment:

- … ideas could become inspirations for more ideas
- … collaboration spurs diverse ideas
- … do not satisfice on your first idea: exhaust your creativity!
- … set time limits: adrenaline and pressure can spark creativity

📖 Interaction Design Foundation: What are the Stages of Creativity? (2026)

Evaluation, Building Consensus as a Team



Categorize and rank the ideas

... e.g. promising, interesting, unconventional, crazy

... don't throw away ideas: they might be useful in the future

All ideas are rough when first visualized, be open to criticism

Be optimistic, give crazy ideas a chance

... it is much easier to scale back a crazy idea that addresses a true need than to try to make a mundane idea desirable,

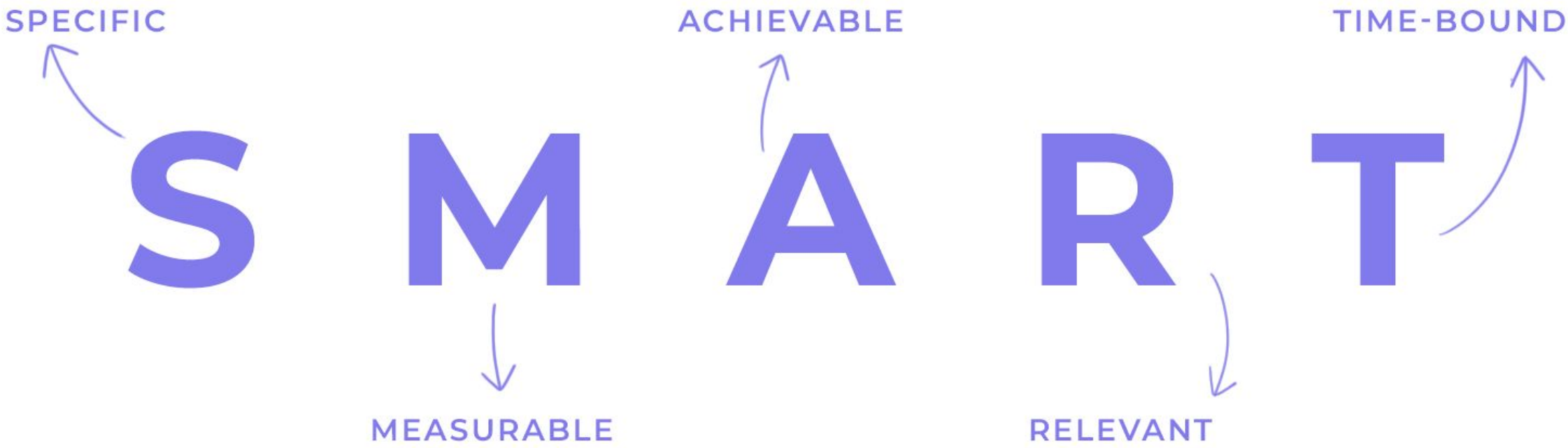
... no right answers, only working solutions

Discuss the documented ideas with the ideation group

📖 Interaction Design Foundation: What are the Stages of Creativity? (2026)

SMART Evaluation





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Week 6 Studio Prep (P6)

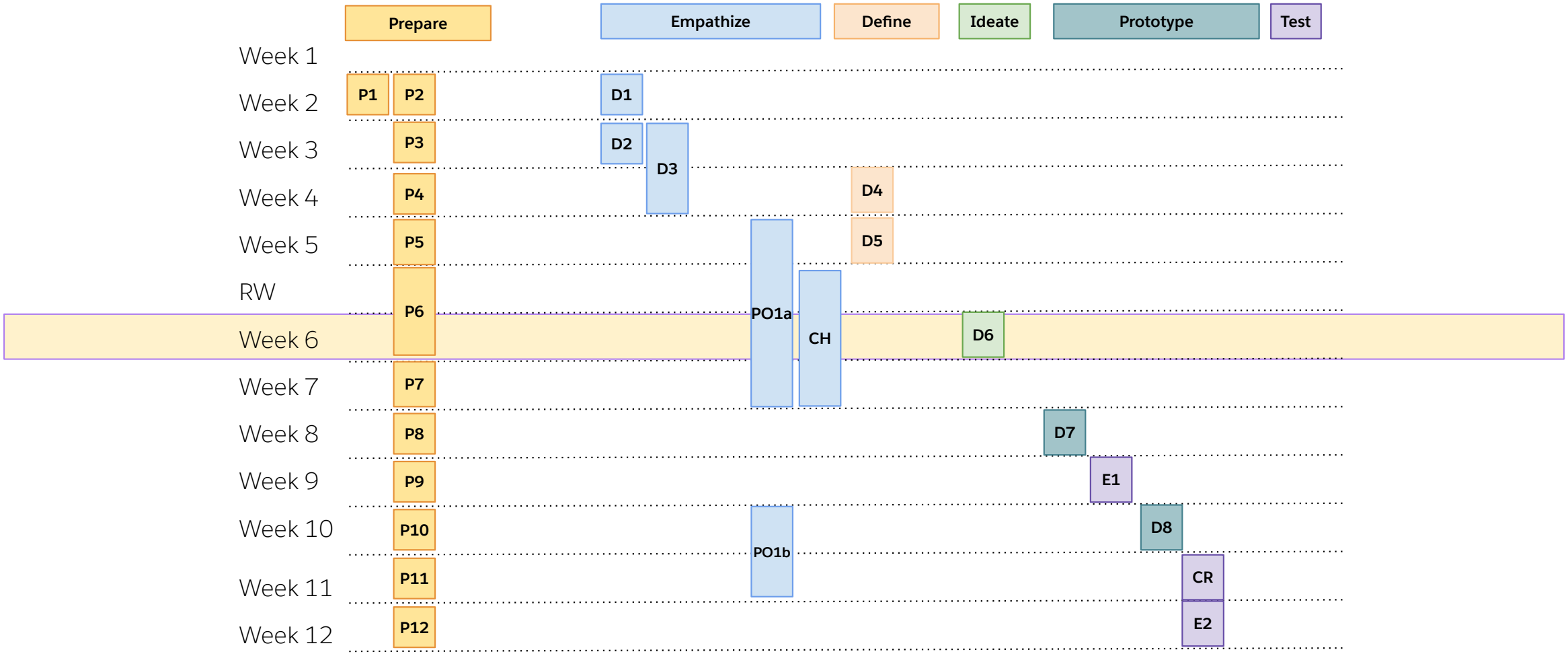
Preparing for D6: Sketches and Flows

Week 6 Studio Prep

Get together with your team to discuss the features again to see if there are any modifications you'd like to make. Write a short paragraph (100 words max) about the modifications.

See updated Week 6 page on course website...

Project Deliverables Build on Each Other



Week 6 Studio Activities – ✍️ Bring Writing Materials!

D6: Create Design Ideas

Epics & Stories (Individual work)

- 4 to 5 epics, in total (depending on the number of team members).
- 2 to 3 Stories per Epic

Storyboards (Individual + Team work)

- Each team member takes their feature and draws its associated storyboard

Looking Ahead to Week 7

Low-fidelity prototyping, Design principles + specifications, Paper prototypes