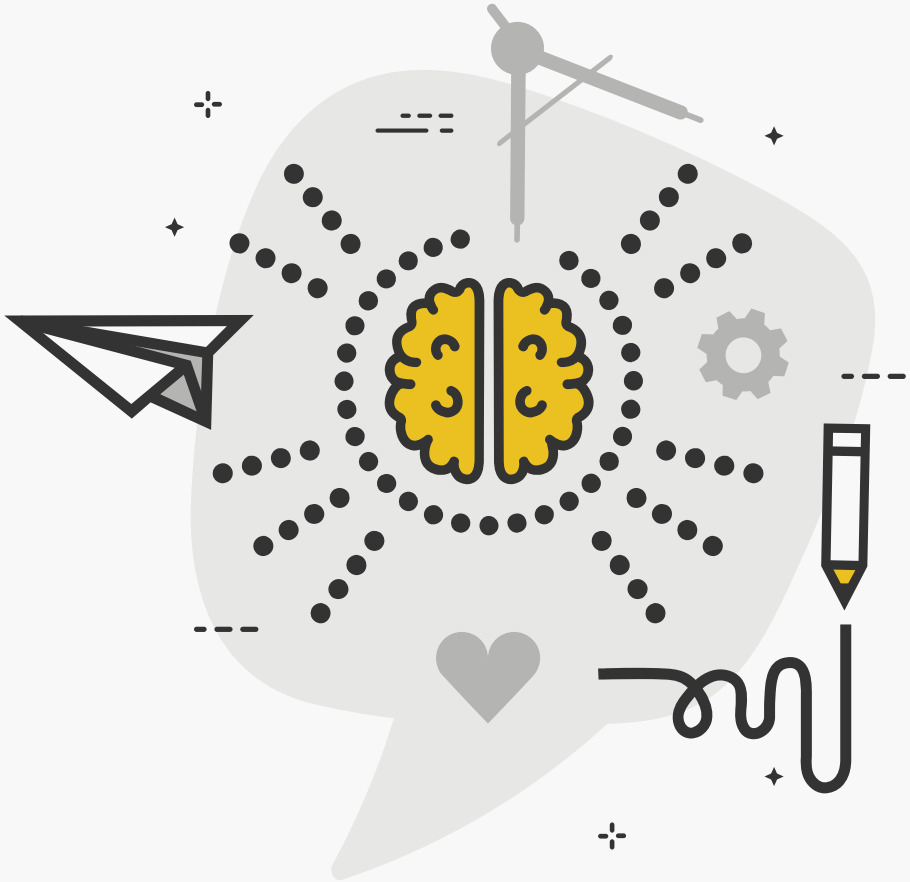
Recitation

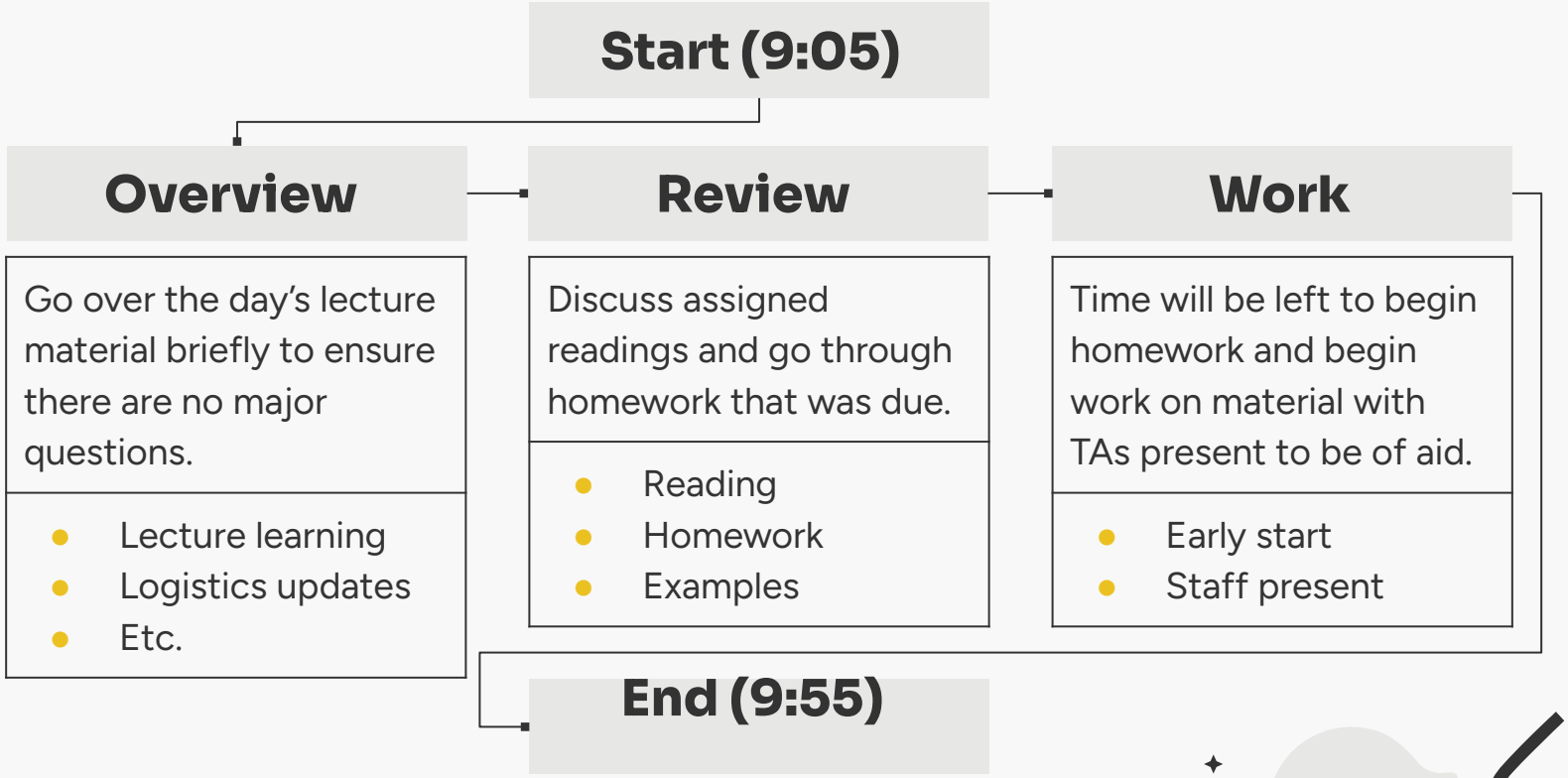
Week 5



Course Evaluations

Attendance

Rough Layout of Recitations



Material Review

1. Problem Space Definition

Well-defined problems make it:

- Easy to better understand how to solve the problem
- Easy for others to understand the problem
- Motivates people to help create value from solving the problem

Problem Definition Structure

Focus the reader on the right group

<affected group, "who?"> currently <way they currently address or approach the situation, or how they currently solve the problem> .

States the current situation, and makes the status-quo clear to the reader

The reason we need to make a change is because <motivating reason why the status quo is a problem> .

Makes this reader care about the problem and understand the consequence of not solving it

Therefore, we will create a solution that enables <affected group> to <experience a desired outcome> .

Focuses the reader on the OUTCOME, NOT the solution, which provides many more solution opportunities

Common Mistakes

Mistakes with logic

1. **Incorrectly identified affected group**

   Did you state a group that's simply part of the system but not the end-user group?

2. **Not stating the root problem (stating a downstream problem instead)**

   Did you identify the core problem, or did you identify a problem that is a result of the core issue?

3. **Specifying the solution instead of a desired outcome**

   Does your outcome enable multiple different non-technical methods to address the problem? Or is there only 1 kind of way to solve the problem, ergo specifying the solution.

Mistakes with articulation

4. **Not stating the current approach/solution/ method neutrally**

5. **Not creating clarity about why the problem should be addressed**

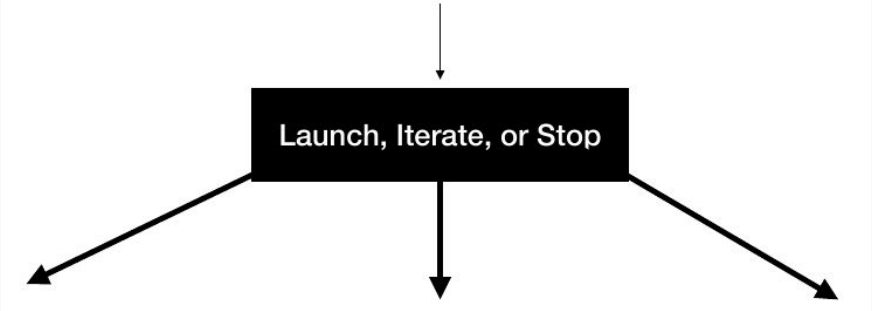
6. **Not stating the magnitude and impact of not solving the problem**

You Try!

Think of the MIT problem you've been working on. Apply today's lessons and write a problem space definition for it.

Now come on up to the board and write it.

12. Launch, Iterate, Stop



Homework Review

Homework Example

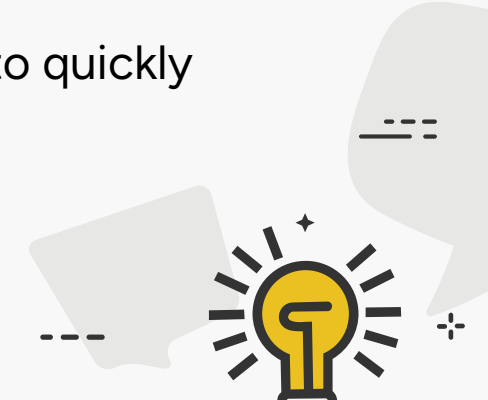
Problem Statement

MIT students currently use the PassioGo app or website to select desired shuttle route and locate tech shuttle location.

The reason we need to make a change is that the current system frequently causes frustration. This is due to delays not being communicated and alternate routes being difficult to identify.

Therefore, we will create a solution that enables MIT students to quickly determine:

- What the best tech shuttle route is
- When the next shuttle will arrive
- If there are important updates regarding shuttle schedule



Types of Desired Outcomes

Emotional

Appeals to feelings

Intellectual

Appeals to the rational mind

How to Measure Success

Objective

i.e. complete a task in x amount of time

Subjective

i.e x% of people gave the experience a 8/10 or higher

6. Specify Desired Outcomes

- Allows users to see all active shuttles on a map in real time.
- Enables users to select their destination stop and get optimal route suggestions (e.g., fastest shuttle or walking alternative).
- Provides live shuttle capacity updates (e.g., “80% full” or “12/15 seats filled”).
- Offers push notifications when a shuttle is approaching a user’s stop (e.g., 2 minutes away).
- Displays estimated arrival times for all stops along the route.
- Automatically refreshes location data every few seconds for up-to-date tracking.
- Sends alerts for schedule changes, delays, or route detours.
- Works smoothly on both iOS and Android, including older devices.

7. Concept Generation

- Simple but improved mobile app that allows users to favorite a stop(s), view live schedule changes, receive alerts about delays, and find alternative routes.
- Campus kiosk that allows users to interact to track a shuttle and find a route
- Digital display system around campus that displays information most likely to be relevant to student (e.g. the regular tech shuttle)
- Smartwatch companion that buzzes with updated when you are near a shuttle stop and there is a shuttle nearby
- Mobile app that uses predictive tracking to suggest important shuttle info based on user schedule and habits.

8. Concept Downselection

Design:		Mobile App #1		Interactive Kiosk	
Criteria	**Weight (1-5)**	**Score (1-5)**	**Weighted**	**Score (1-5)**	**Weighted**
Easy to access on-the-go	3	5	15	3	9
Accessible for all students	4	4	16	4	16
Low implementation costs	3	4	12	3	9
Ease of use	5	4	20	4	20
		Total	**63**	**Total**	**54**

9. Concept Articulation (K-Script)

Who	Observable Action	Unobservable Action
Student	Taps shuttle app	App launches
App	Displays a large grid of route options, including “Tech Shuttle”, “Campus Saferide”, “Boston Daytime”, and “Campus Northwest”	
Student	Taps to select “Tech Shuttle” and “Campus Saferide”	
App	Displays a live map with Tech Shuttle schedule. Displays “Campus Saferide not in service currently” in a banner at the top	Loads the routes the student selects, including shuttle capacity, driver name, and updated location. Determined that it is not Campus Saferide hours

9. K-Script Cont.

Who	Observable Action	Unobservable Action
Student	Taps a circular icon on the map to indicate that they want to board at the Kresge stop	
App	Displays the message: “Tech Shuttle will arrive at Kresge in 15 minutes”	
App	Are you getting off before the Simmons stop? (Displays yes or no button)	Notices that there is a Trader Joes shuttle arriving soon that follows the same route for several stops
Student	Yes	Knows they are getting off at MacGregor, which is before the Simmons stop

9. K-Script Cont.

Who	Observable Action	Unobservable Action
App	Displays: Great! The Trader Joes shuttle arrives in 2 minutes and takes the same route.	
App	Displays Trader Joes live map and updates as well	

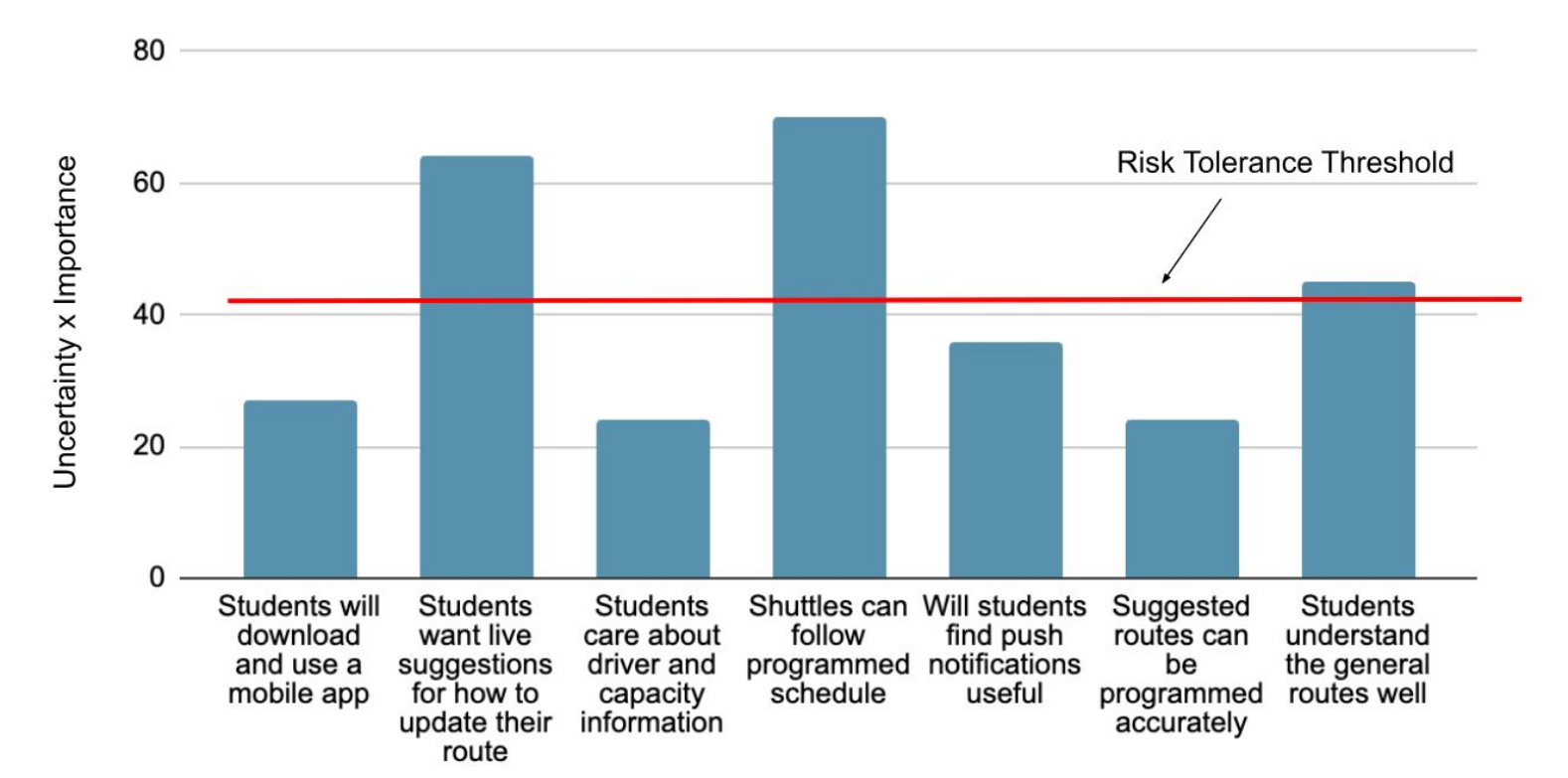
10. Uncertainty Identification

Feature	Uncertainty (1-10)	Importance (1-10)	Uncertainty x Importance
If people will use them	3	9	27
Students want live suggestions for how to update their route	8	8	64
Students care about driver and capacity information	8	3	24
Shuttles can follow programmed schedule	10	7	70

10. Uncertainty Identification

Feature	Uncertainty (1-10)	Importance (1-10)	Uncertainty x Importance
Will students find push notifications useful	6	6	36
Suggested routes can be programmed accurately	3	8	24
Students understand the general routes well	5	9	45

10. Uncertainty Identification



10. Uncertainty Reduction

Students will want live suggestions for how to update their route:

- Interview 50 students or send a dormspam to see if students would be interested in this feature

Shuttles can follow the programmed schedule:

- Observe various routes for several days to understand their estimated versus actual arrival time
- Discuss with tech shuttle admin to gain insight into scheduling reliability

Students understand the general routes better:

- Send a dormspam with a fun “quiz” to understand how much people understand about the setup of most routes
- Interview friends casually to gain insight into what others understand about the routes

Exam Preparation

Use the tables and processes

2. Research & Discovery

	Accessibility	Usability	Physical Resource Consumption
Electronic kiosks scattered across campus	High if student lives near/has class near kiosk but low otherwise	High – students can go to a kiosk and navigate to a specific dining hall's options or filter by cost/dietary restriction	High while building infrastructure but low after that
App/Website	High – can access from any laptop or mobile device	High – app can contain filters for dining halls, cost, and dietary restrictions	Low (no physical resources necessary)
Printed menus outside each dining hall	Low – need to go to dining hall before knowing options	High – easy to read from a physical piece of paper	High (hundreds of sheets of paper every day)

4. Stakeholder Analysis

Stakeholder	Type	Why we care	Priority	How to Satisfy
Students	Users	They should have a high quality of life	High	Create a user-friendly product that is accessible to students
Dining staff	Transformer	They input menu information	Medium	Create a product that is easy to write information to
Dining admin	Approver/Blocker	They input cost information and oversee the dining staff	Medium	Create a product that is easy to write information to and won't take too much time from the dining staff
MIT admin	Approver/Blocker	They have the ability to reject the idea	High	Create a cost-effective and resource-efficient solution
Product developers/ distributors	Supplier	They have to make the product	Medium	Create a solution that is easy to implement

5. Boundary & Hazard Mitigation

Boundary/Hazard	Likelihood (1-10)	Severity (1-10)	Impact	Mitigation Strategy	Cost Effectiveness (1-10)
Incorrect information	5	7	35	Have someone double-check information before its posted	5
System shuts down	2	10	20	Have a backup system on another server	2
Delay in updated information	6	4	24	Put timestamps on latest update	9

Reading Discussion

Question 1

- How does the “edge of chaos” concept central to Scrum teams mirror the rapid innovation and adaptation described during the COVID-19 pandemic? Can students think of examples where organizations applied Scrum concepts to innovate under crisis, and what lessons were learned about resilience and process?

Question 2

Both readings emphasize responding to uncertainty through iterative problem-solving and constant adaptation. In what ways does the COVID-19 innovation framework benefit from Scrum’s principles of inspection, transparency, and adaptation? Are there any limitations to applying Scrum methodology in wide-scale organizational innovation beyond software, as seen during the pandemic?

Question 3

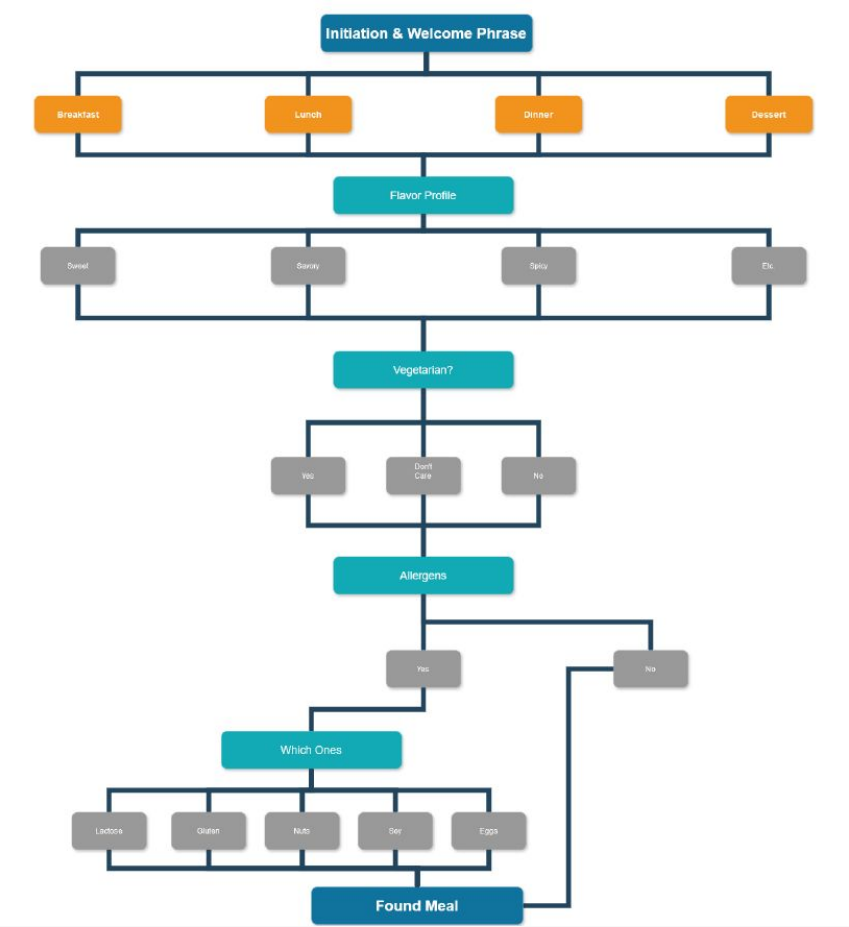
What does the article mean by “anchoring on the constraints of the solution rather than the clarity of the problem,” and how can this concept be critically evaluated?

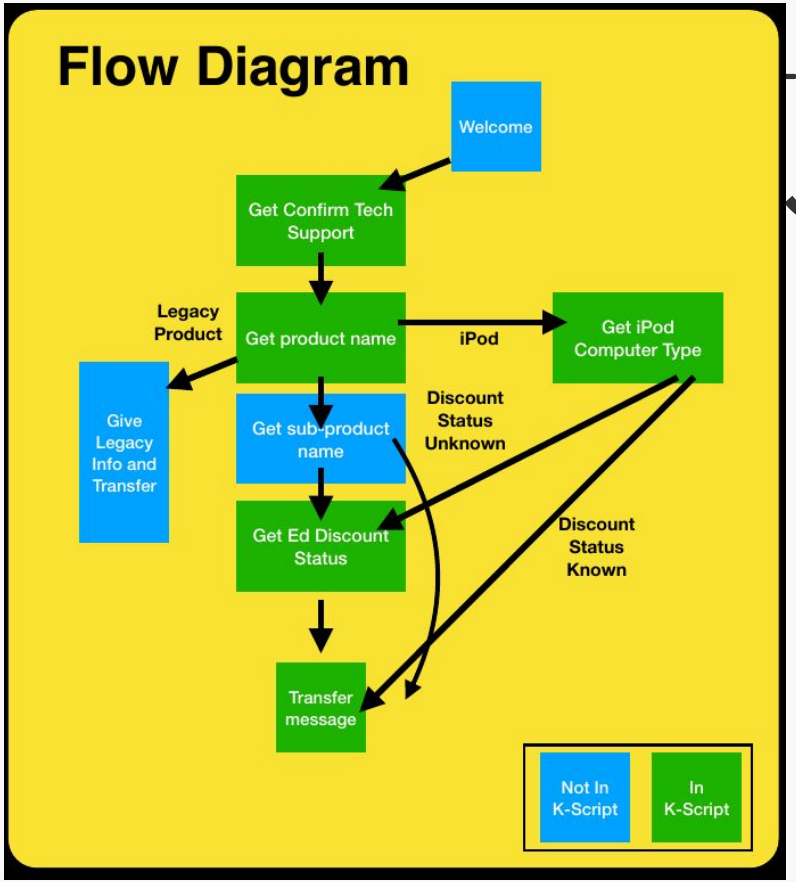
Homework 

D-TILE Techniques Part IV: Designing Interaction Flows

- Create a conversation flow chart or interaction map
- K-Script your problem

Conversation Flow Chart / Interaction Map





Questions?

Contact D-TILE Staff @ Any Time
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MUD Cards