



# DESIGN THINKING AND PRACTICE: HANDS-ON WORKSHOP ON DESIGN THINKING

Bernard Suen  
Center for Entrepreneurship  
Chinese University of Hong Kong



Center for  
Entrepreneurship

## **TEAM FORMATION RULES**

1. 6 students per team
2. At least one foreign (including exchange) student per team
3. At least one member of the opposite sex
4. At least one member from science or engineering and one from economics or business.
5. Exception can be granted with approval from instructor

# **WORKING WITH YOUR TEAM FOR THE UPCOMING LESSONS**

#### **4. Hands-on Workshop on Design Thinking (3 hrs)**

- (a) Participate in an empathy exercise
- (b) User experience mapping and problem definition
- (c) Conduct system analysis and design to generate alternative solutions
- (d) Role-playing presentation

#### **5&6 Big Three of Web Development (6 hrs)**

- (a) HTML - the noun in web publishing
- (b) CSS - the adjective in web publishing
- (c) JavaScript - the verb in web publishing
- (d) Using Git, front-end software library and visual user interface (UI) builder for static web development and publishing

#### **7&8 Navigating the Data Cycle (6 hrs)**

- (a) Data extraction and transformation with latest digital tools
- (b) Loading data into SQL database for filtering and processing
- (c) Installing, configuring, and customizing a content management system (CMS) for rapid web development
- (d) Application integration with CMS and SQL database

# **QUICK RECAP**

<b>Design Thinking</b>	<b>Computational Thinking</b>	<b>Description</b>
Empathy	Decomposition	Collect and analyse <u>stories and data</u> to understand the stakeholders and discover their needs.
Definition	Patterns	Synthesise recurring <u>persona types, contexts, artefacts, and scenario</u> patterns to formulate problem ( <b>who, what, and why</b> ).
Ideation	Abstraction	Develop socio-cultural and technical systems to reshape user stories and data flow.
Prototyping	Algorithm	Build <u>experience prototype and computational models</u> to represent future scenarios for validation.
Testing & Implementation	Automation & Evaluation	Continuous testing, improvement and automation to evaluate <u>functional, emotional, social, economic and environmental</u> impacts ( <b>how and how much</b> ).

**What is the key lesson you can learn from the  
“Marriott lobby experience” case in integrating  
design thinking with computational thinking?**

# Case Study: Redesigning the Lobby Experience



Exploring the Hotel Experience of the Future with Marriott Hotels

Source: MIT Mobile Experience Lab

HOME

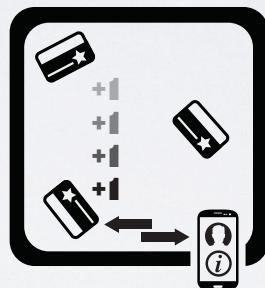


Joins loyalty program, creates a profile & installs phone app.

LOBBY



Given physical loyalty card on check-in — stores profile info, points & doubles as room key.



(Can be done in lobby or room)  
Set availability via orientation of card. (Lobby only) Loyalty points awarded to cards at the same table. Table lights up to show activity, interests shown on table & lobby display map. Profiles added to app network.

ROOM

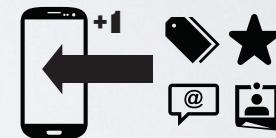
BOOKING

CHECK-IN

MEETUP

RETURN

## INTERACTIONS OUTSIDE HOTEL



Prompted by app to tag places visited, ratings & social media for points — added to in-app database of recommendations.

Source: MIT Mobile Experience Lab

# THE JOURNEY AS A STORY

## Elements (元素)

1. PERSONA - 人 (人物)
2. CONTEXT - 景 (場景)
3. ARTEFACTS - 物 (文物)
4. SCENARIOS - 用 (情況)

## Structure(結構)

1. BEGINNING - 起 (背景)
2. CHALLENGE - 承 (問題)
3. RESPONSE - 轉 (回應)
4. RETURN - 合 (循環)

資料來源---劇本導引：  
資訊時代產品與服務設計新法  
作者余德彰, 林文綺, 王介丘

# **Patterns: Persona Types, Contexts, Artefacts, Scenarios**

# avid social explorer

Gen Y travelers seeking personalized yet serendipitous experiences, good company to share them with, and the ability to capture and celebrate them.



# PERSONA

# bored lobbygoer in transition

Anyone using the lobby as a meeting place or gathering point, looking to pass the time and avoid awkwardness.



## Source: MIT Mobile Experience Lab

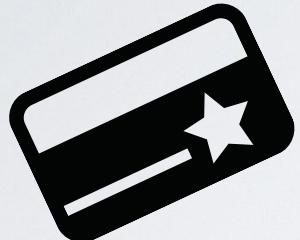


## CONTEXTS

Source: MIT Mobile Experience Lab

## ARTEFACTS

### THE CARD



### THE TABLE



### THE APP



room key  
point counter  
status symbol

the social hub

shared memory  
social networks  
recommendations

**LOYALTY**

**INTERACTION**

**DATA**

Source: MIT Mobile  
Experience Lab



# ROLE PLAY PHYSICAL EXPERIENCE

## SCENARIOS

Source: MIT Mobile Experience Lab

# **WHAT'S NEW?**

HOME

LOBBY

ROOM

BOOKING

CHECK-IN

MEETUP

RETURN



## USER JOURNEY MAP

profile, activity, points



Give check-in  
points



Profile, activity, points  
of other guests at the same table. Table lights up to show activity, interests shown on table & lobby display map. Profiles added to app network.

INTERACTIONS

OUTSIDE HOTEL



Review Data

Profile visit  
for review  
database.



Database

profile, activity,  
points

Source: MIT Mobile  
Experience Lab

## **KEY LESSON: UX + DATA**

**The data factor is pervasive throughout the journey.**

HOME

LOBBY

ROOM

BOOKING

CHECK-IN

MEETUP

Source: MIT Mobile  
Experience Lab

# USER JOURNEY MAP

profile, activity, points

Booking  
Data

Check-in  
Data

Interaction  
Data

Review  
Data

Give check-in points  
on app. Points added to profile.  
Profile added to app network.

Profile, activity, points  
from app. Points added to profile.  
Profile added to app network.

Profile, activity, points  
from app. Points added to profile.  
Profile added to app network.

Profile, activity, points  
from app. Points added to profile.  
Profile added to app network.



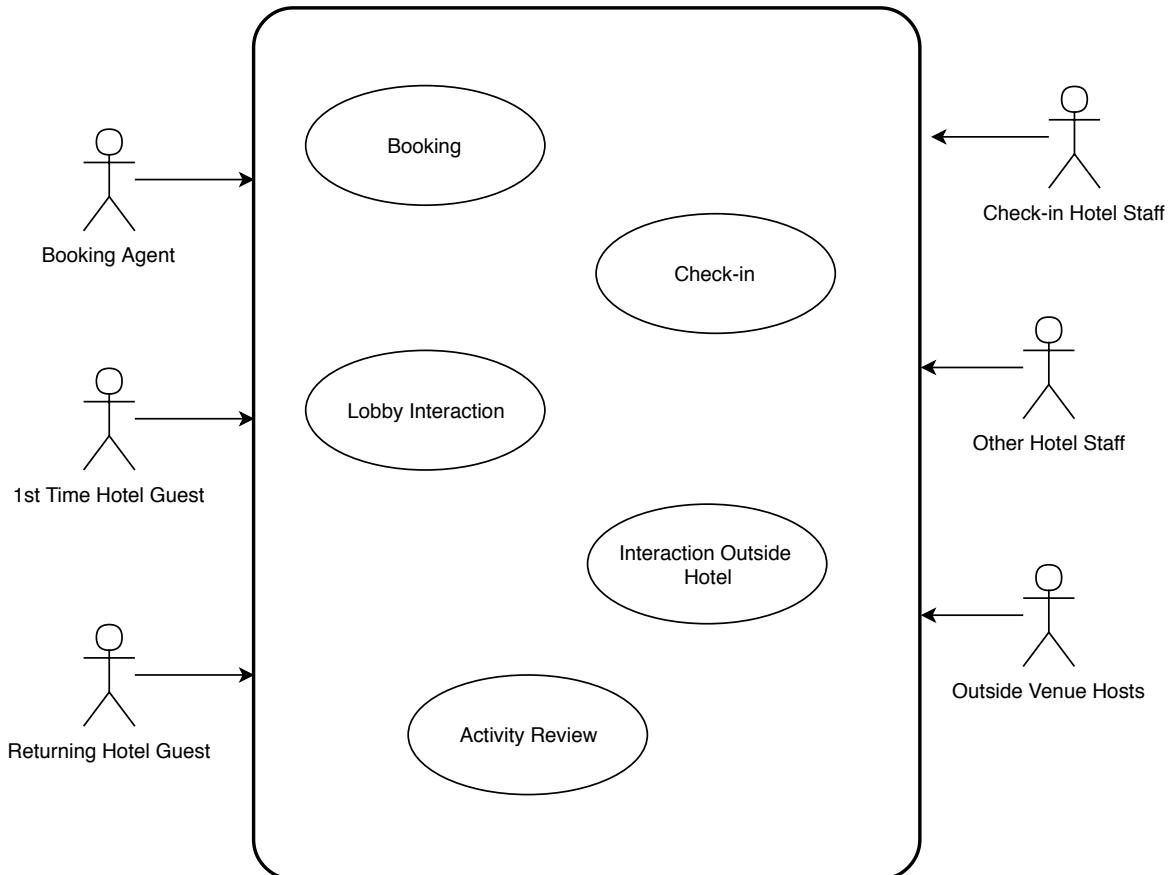
Places  
Media  
Group  
Actions.



Database

INTER  
OUTSI  
TEL

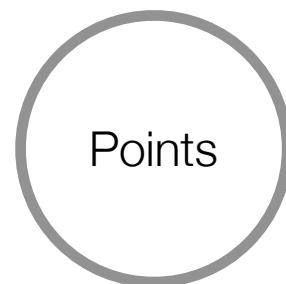
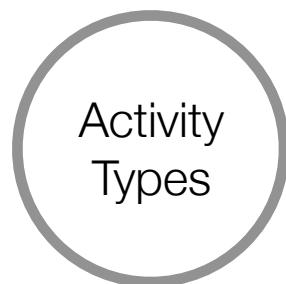
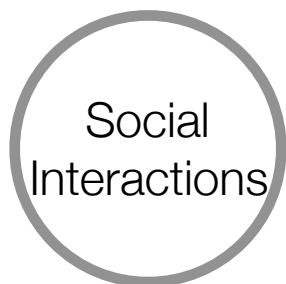
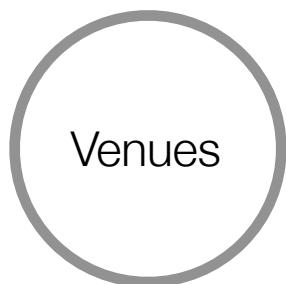
**Develop use cases from journey map.**



## Use Cases of a Hotel Loyalty App

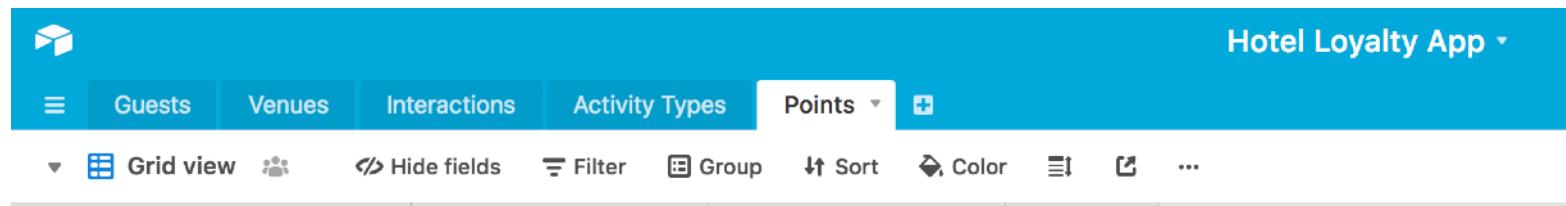
**Derive data entities from use cases.**

# Data Entities to be Tracked



- e.g.
  - 1st time guests
  - Returning guests
- e.g.
  - Starbuck
  - Bar inside hotel
  - Boston Metropolitan Museum
- e.g.
  - Add friends
  - Take pictures
  - Share rides
  - Split bills
- e.g.
  - Museum tour
  - Bar hopping
  - Scenic picture taking
  - Business meeting
- e.g.
  - Revisit
  - Dine in hotel
  - Shop in hotel
  - Initiate contact
  - Give reviews

# Tracking Data Entities





“Computer Science itself is not really about computers or programming for that matter. It’s really **about information, how you think about it** and how you represent it with what methods or algorithms you can process it.”

David J. Malan , Gordon McKay  
Professor of the Practice of Computer  
Science at Harvard University

**To understand and construct our world  
through data models.**

**From journey mapping to data mapping: Turn  
story into system, UX journey into use case  
and data.**

**TO UNDERSTAND DATA, WE NEED TO  
UNDERSTAND DATABASE**

# **WHAT IS A “DATABASE”?**

“A **Database** is a computerised system that makes it easy to search, select and store information..”

*BBC Website*



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**AIRTABLE UNIVERSE**

**Explore, discover, and share your passion**

## Cole Haan Creative Operations

Cole Haan Brand Creative is an in-house, full service agency. Our Creative Operations team manages...

Andrew Coulter Enright

## Twilio's Lightweight CMS

Tony Mataya

## Britannica's Digital Content Management System

Alison Eldridge

## Insomniac Events' Staffing Template

Insomniac Events

# **USING EPIN1020 AS AN EXAMPLE**



EPIN1020

HELP ?

Students Teams Attendance Problem Sets Class Calendar +

SHARE

BLOCKS

Class Calendar Using "Date" field Filter Sort Color ...

Today < > September 2018

Mon Tue Wed Thu Fri Sat Sun

Mon	Tue	Wed	Thu	Fri	Sat	Sun
27	28	29	30	31	1	2
3	4	5 What is Design Thinking?	6	7	8	9
10	11	12 Computational Thinking and Coding	13	14	15	16
17	18	19 From User Journey to Data Cycle	20	21	22	23
24	25	26 Hands-on Workshop on Design Thi...	27	28	29	30

# **RECAP OF “AIRTABLE” AND THE “DATABASE” CONCEPT**

- 1. Creating a database (called a “Base” in Airtable)**
- 2. Create a table or import from a spreadsheet (e.g. csv file)**
- 3. Add fields to the table and customise field type.**
- 4. Build relationships between fields and tables.**
- 5. Create views (calendar, kasan and gallery views)**

- 6. A database is a collection of tables.**
- 7. A table is a collection of records (rows) with each record containing information about one unique entity (e.g. student, class, product)**
- 8. A record is collection of fields (columns) with each field representing an attribute of the entity.**
- 9. A key field is a unique attribute for differentiating one record from another (e.g. student id)**

# **USEFUL TOOLS FOR PROJECT MANAGEMENT AND DOCUMENT TRACKING**

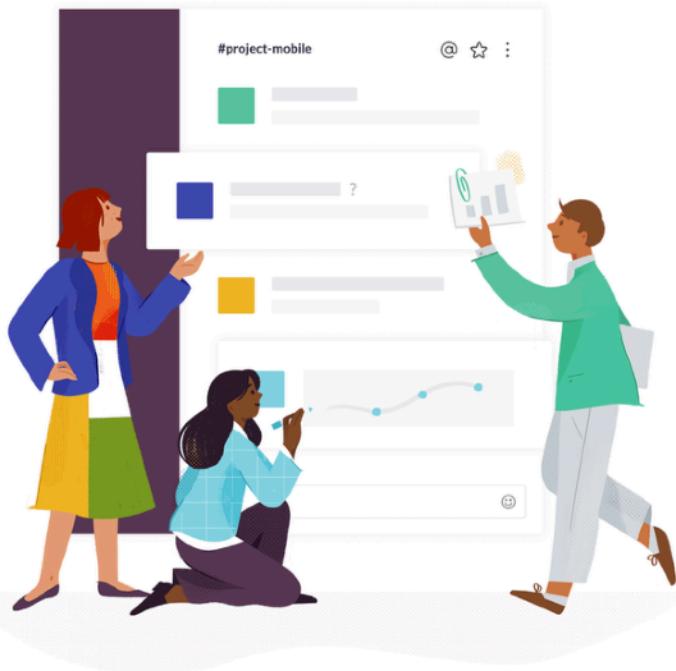
# **WORKING WITH YOUR TEAM FOR THE UPCOMING LESSONS**

- **Slack** - for team collaboration and project management  
(can be downloaded from <https://slack.com/>)
- **GitHub Desktop** - for version control and tracking of documents  
(can be downloaded from <https://desktop.github.com>)



Why Slack?   Solutions   Resources   Pricing

Your Workspaces



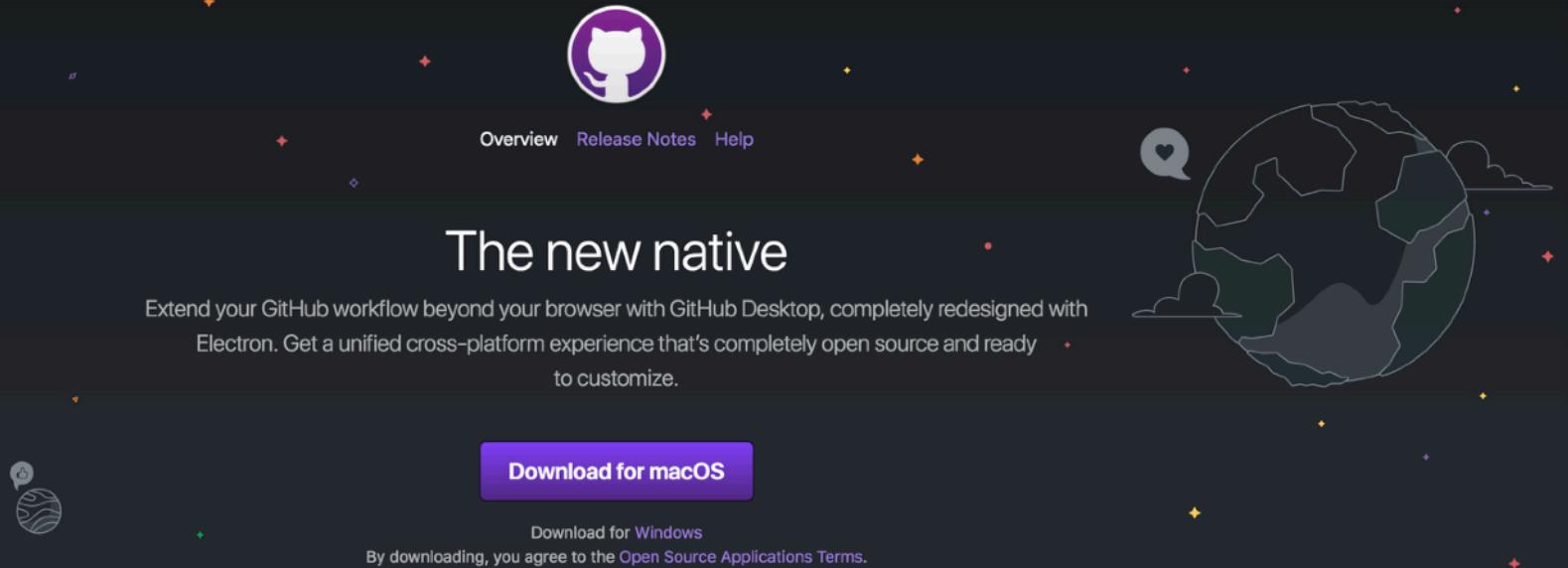
# Where Work Happens

When your team needs to kick off a project, hire a new employee, deploy some code, review a sales contract, finalize next year's budget, measure an A/B test, plan your next office opening, and more, Slack has you covered.

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[https://join.slack.com/t/epin-1020/shared\\_invite/enQtNDQyODMwMjE4NDg1LWQ0OTg2Y2E2ZDM2MTk3Y2NmYjU2OGNjMTc5MjljMjdkYzE5NTA5YjBjMDg1N2I1MGJIZGRjYTQ2Y2Q0N2YzYTM](https://join.slack.com/t/epin-1020/shared_invite/enQtNDQyODMwMjE4NDg1LWQ0OTg2Y2E2ZDM2MTk3Y2NmYjU2OGNjMTc5MjljMjdkYzE5NTA5YjBjMDg1N2I1MGJIZGRjYTQ2Y2Q0N2YzYTM)



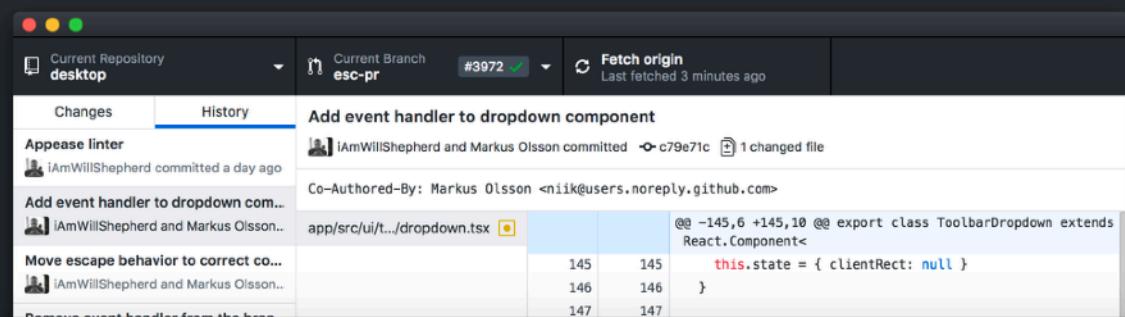
The new native

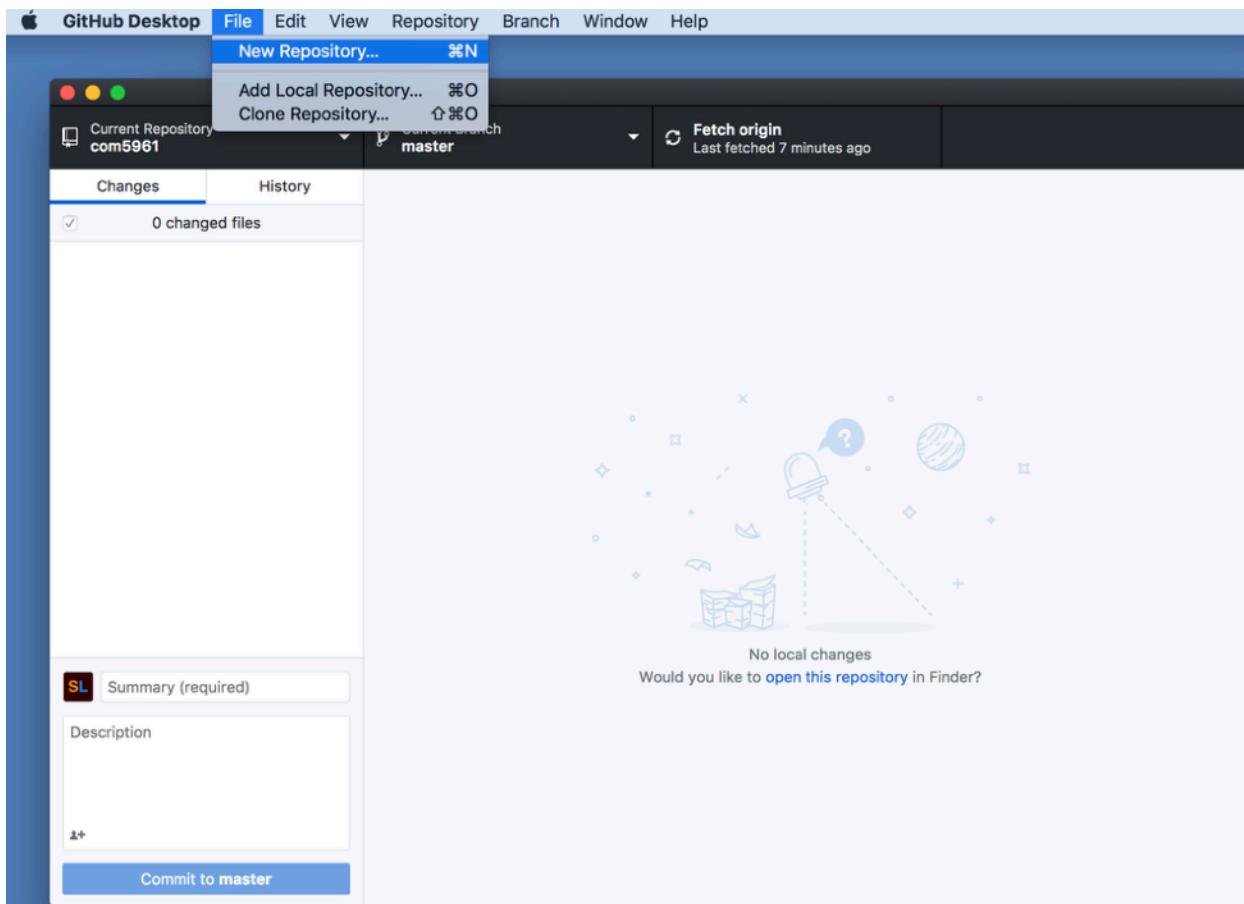
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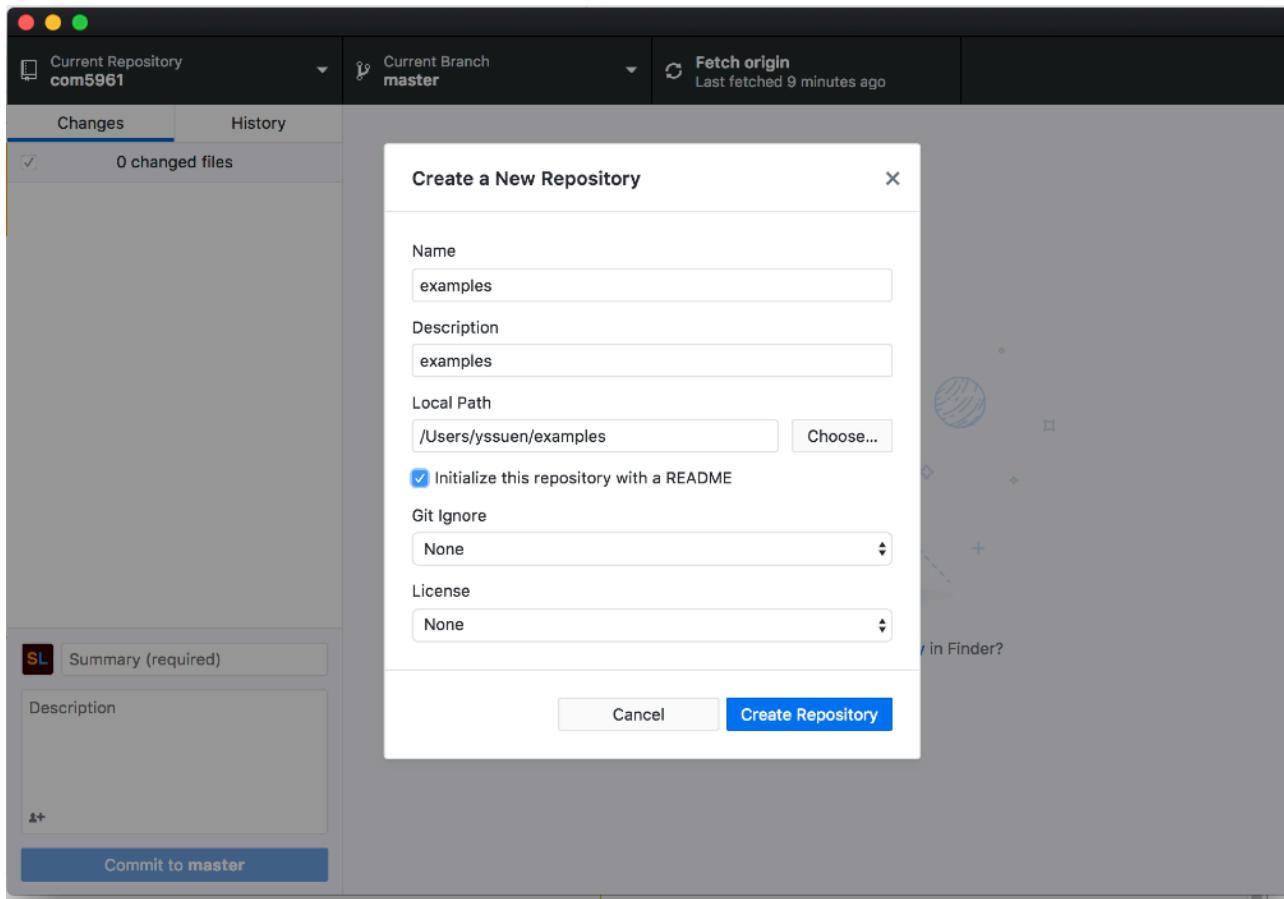
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Projects 0

Wiki

Insights

No description, website, or topics provided.

28 commits

1 branch

0 releases

1 contributor

Branch: master ▾

New pull request

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MengrongXu Update README.md

Latest commit f5177c2 on 26 Mar

Assignment_1	2nd Assignment	8 months ago
assignment2	2nd Assignment	8 months ago
assignment_3	Add files via upload	7 months ago
assignment_4	Update README.md	6 months ago
assignment_5	Update README.md	6 months ago



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0



0



0

Code

Issues 0

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Projects 0

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com5940 / assignment2 /

Create new file

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Find file

History

MengrongXu 2nd Assignment

Latest commit 692433c on 13 Feb

..

README.md

2nd Assignment

8 months ago

assign2.py

2nd Assignment

8 months ago

result.html

2nd Assignment

8 months ago

README.md

2nd Assignment

- [The Pythonanywhere Page](#)

**Send me your GitHub URL through Slack**

Slack needs your permission to [enable desktop notifications](#).

com5961 v cuhk\_com5961

Chaoran Li ⚡ | ⚡ notifications snoozed

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Channels # general # random

Direct Messages +

slackbot cuhk\_com5961 (you) Baoyi Chaoran Li Chongjing Joyce Julie Kumi Liu xuechen Louise Xia Ma zhuoer Mandy Ng Qiu Taodong Sally WEI Qianhan Wenjun Wu Xiaotan Xuting Xue

Chaoran Li ⚡

This is the very beginning of your direct message history with @Chaoran Li

Monday, September 24th

Chaoran Li 9:18 PM <https://github.com/lorrainy123> GitHub lorrainy123 lorrainy123 has one repository available. Follow their code on GitHub.

Yesterday

cuhk\_com5961 1:05 AM Your student id? Only visible to you slackbot 1:05 AM Chaoran Li is currently in Do Not Disturb mode and may not be alerted of this message right away. If it's urgent, [click here](#) to send a notification now. Keep in mind, if the recipient has all notifications turned off, they will only get your message when they're back online.

How does Do Not Disturb work? Learn more in this Help Center article: [Do Not Disturb](#)

+ Message @Chaoran Li @ 😊

EPIN1020

HELP 🔍 🔍 BLOCKS

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Grid view Filter Group Sort Color ...

	CUSIS ID	First Name	Github URL	Team	Sex	email	Nationality	Academic Program ...	Year of ...	Residency	Total
1	1155094122	Fu Kiu			Male	1155094122@link.cuhk.e...	Hong Kong	BSc Biomedical Sciences	YR3	Local Students	
2	1155082822	Imaya Manalakshmi			Female	1155082822@link.cuhk.e...	USA	Bachelor of Laws	YR3	Non-Local Students	
3	1155090826	Yu Sum Jenny			Female	1155090826@link.cuhk.e...	Hong Kong	BSc Biomedical Sciences	YR3	Local Students	
4	1155093393	Tsz Yau			Female	1155093393@link.cuhk.e...	China	BSc Biomedical Sciences	YR3	Local Students	
5	1155093391	Hoi Man			Female	1155093391@link.cuhk.e...	United Kingdom	BSc Biomedical Sciences	YR3	Local Students	
6	1155055615	Chiou Yang			Male	1155055615@link.cuhk.e...	Taiwan	BBA Integrated BBA Prog...	YR5	Non-Local Students	
7	1155123287	Marius Christian			Male	1155123287@link.cuhk.e...	Germany	IASP	YR1	Non-Local Students	
8	1155123127	Carl Johan Aake Wilhelm			Male	1155123127@link.cuhk.ed...	Sweden	IASP	YR1	Non-Local Students	
9	1155092999	Sze Shing			Male	1155092999@link.cuhk.e...	Hong Kong	BSc Biomedical Sciences	YR3	Local Students	
0	1155123014	CHEZ Karime			Female	1155123014@link.cuhk.ed...	Mexico	IASP	YR1	Non-Local Students	
1	1155124034	Josef Wolfgang			Male	1155124034@link.cuhk.e...	Austria	IASP	YR1	Non-Local Students	
2	1155092570	Wai Shan			Female	1155092570@link.cuhk.e...	Hong Kong	BBA Integrated BBA Prog...	YR3	Local Students	
3	1155086122	Pei Lun			Male	1155086122@link.cuhk.e...	Taiwan	BBA Integrated BBA Prog...	YR3	Non-Local Students	
4	1155078284	Yi Yan			Female	1155078284@link.cuhk.e...	China	BSSc Sociology	YR4	Local Students	
5	1155123843	Kelly			Female	1155123843@link.cuhk.e...	Netherlands	IASP	YR1	Non-Local Students	
6	1155093663	Cho Yiu			Female	1155093663@link.cuhk.e...	Hong Kong	BSc Biomedical Sciences	YR3	Local Students	
7	1155083818	Chun Teng			Male	1155083818@link.cuhk.e...	Taiwan	BBA Integrated BBA Prog...	YR3	Non-Local Students	
8	1155093370	Ting Ting			Female	1155093370@link.cuhk.e...	Hong Kong	BSSc Sociology	YR3	Local Students	
9	1155072298	Hoi Kei			Female	1155072298@link.cuhk.e...	Macau	BBA Integrated BBA Prog...	YR4	Non-Local Students	
0	1155092772	Tsz Wing			Male	1155092772@link.cuhk.e...	Hong Kong	BSSc Journalism & Com	YR3	Local Students	
1	1155101079	Jiaxun			Female	1155101079@link.cuhk.ed...	China	BSc Biomedical Sciences	YR2	Non-Local Students	
2	1155092255	Wing Tung			Female	1155092255@link.cuhk.e...	Hong Kong	BSc Biomedical Sciences	YR2	Local Students	

7 records

# **BREAK**

# **USER JOURNEY - BEFORE AND AFTER**







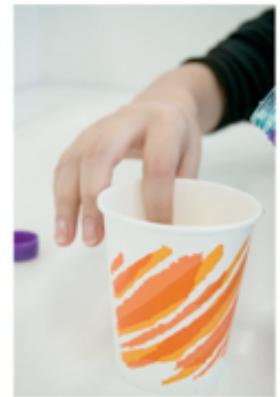
Source:Icon made by Zurb from [www.flaticon.com](http://www.flaticon.com)

## A DAY IN THE LIFE OF A VISUALLY IMPAIRED PERSON

- Pick one member from the groups to play the role of a visually impaired person. The person will be given a task to perform.
- While the designated group member is performing a task, the other members have to keep quiet. Just observe and take notes.
- The designated group member should think aloud while performing the assigned tasks to let others know what it is going on in one's mind.



Source: The Heart's Way: Design with Empathy Through Creative Thinking  
(2014) Yanyan Lam, Bernard Suen, David Lee and Carrie Chan



Source: The Heart's Way: Design with Empathy Through Creative Thinking  
(2014) Yanyan Lam, Bernard Suen, David Lee and Carrie Chan

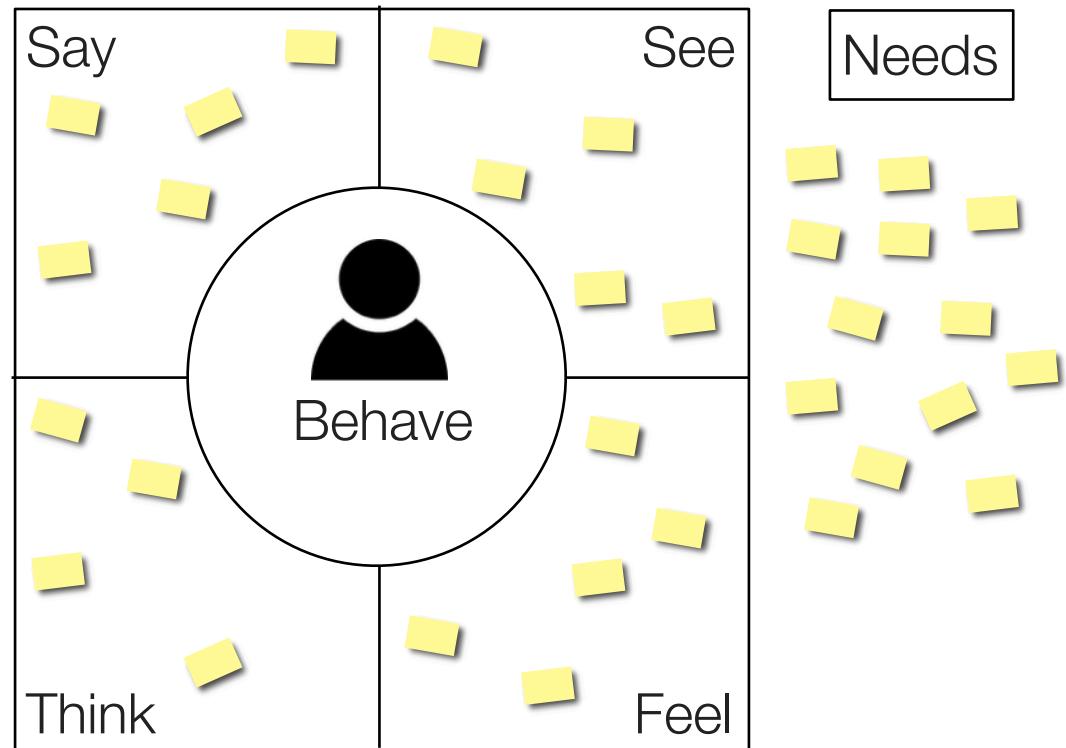
- Complete an empathy map of the persona given what the team has observed using post-it notes.
- Each team will present one's empathy map with the goal to discover insights on the problem and the limitations of current offering?
- You have 15 minutes to complete the map.

# **PROBLEM DISCOVERY**

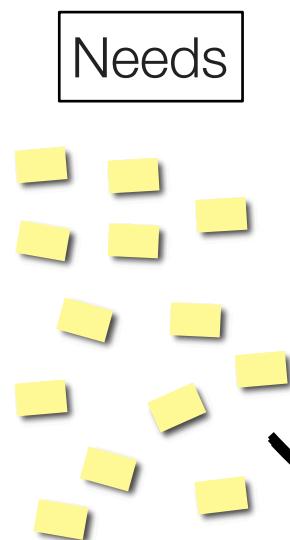
# Empathy Map

Please note: You cannot directly observe thoughts and feelings. It must be inferred by paying careful attention to body language, tone, and choice of words.

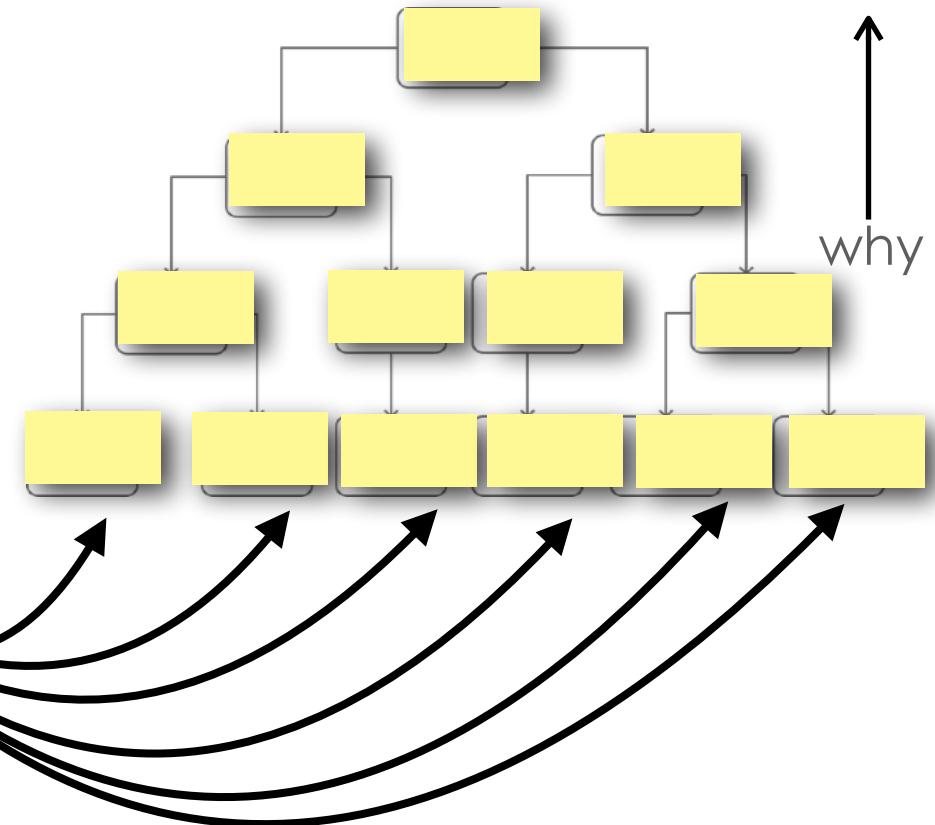
Source: Interaction Design Foundation



# How/Why Laddering

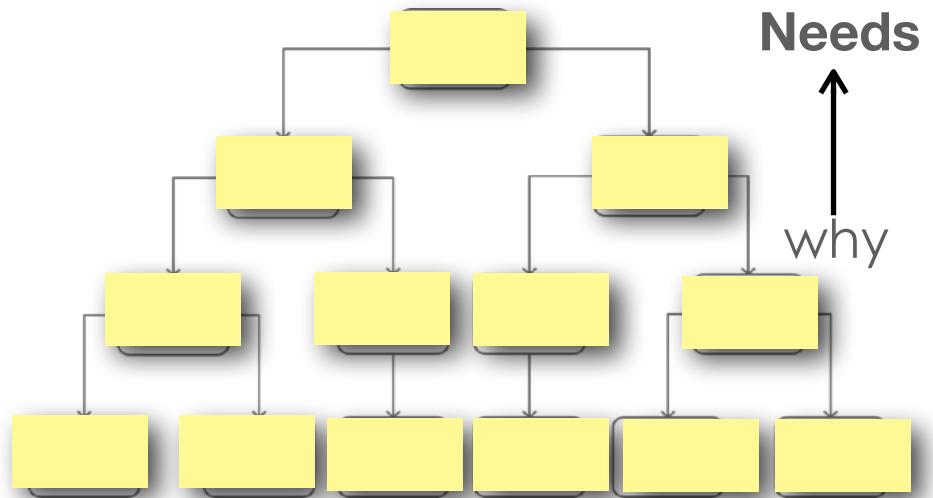


Source: Interaction Design Foundation



# How/Why Laddering

How/Why Laddering decomposes complex, abstract needs into simpler, more specific tasks, or conversely keep asking why (e.g. 3 times) to find out the underlying needs that compel people to perform certain tasks.



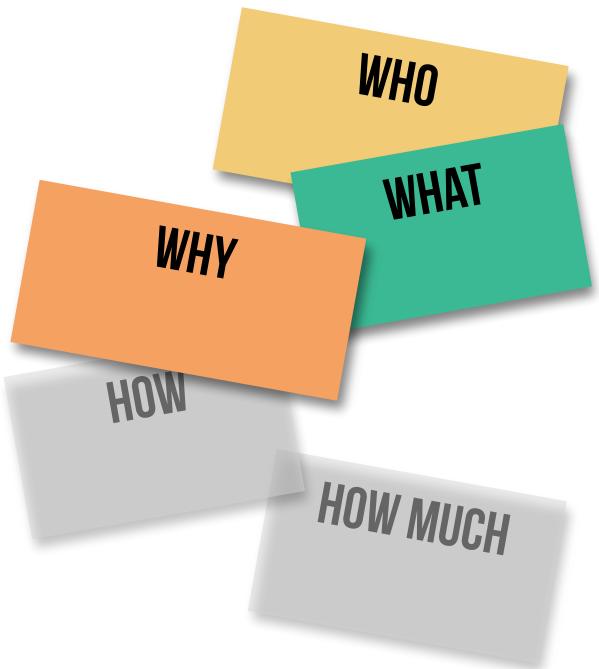
Source: Interaction Design Foundation

# Current Journey Map

	BEGIN	CHALLENGE	RESPONSE	RETURN
PERSONA				
CONTEXT				
ARTEFACTS				
SCENARIO				

# Point of View

User (Who)	Experience (What)	Needs (Why)



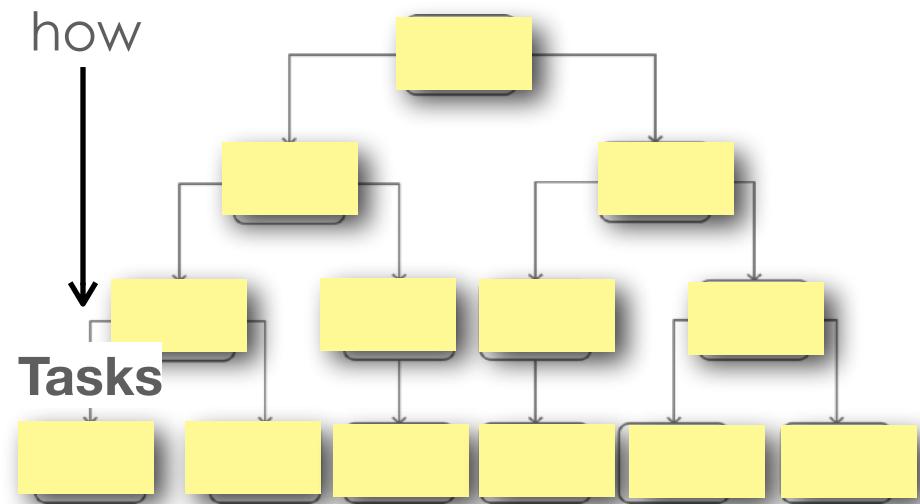
## PROBLEM STATEMENT (IN ONE SENTENCE):

Synthesis of **who**, **what** and **why**

# **PROBLEM SOLUTION**

# How/Why Laddering

How/Why Laddering decomposes complex, abstract needs into simpler, more specific tasks, or conversely keep asking why (e.g. 3 times) to find out the underlying needs that compel people to perform certain tasks.

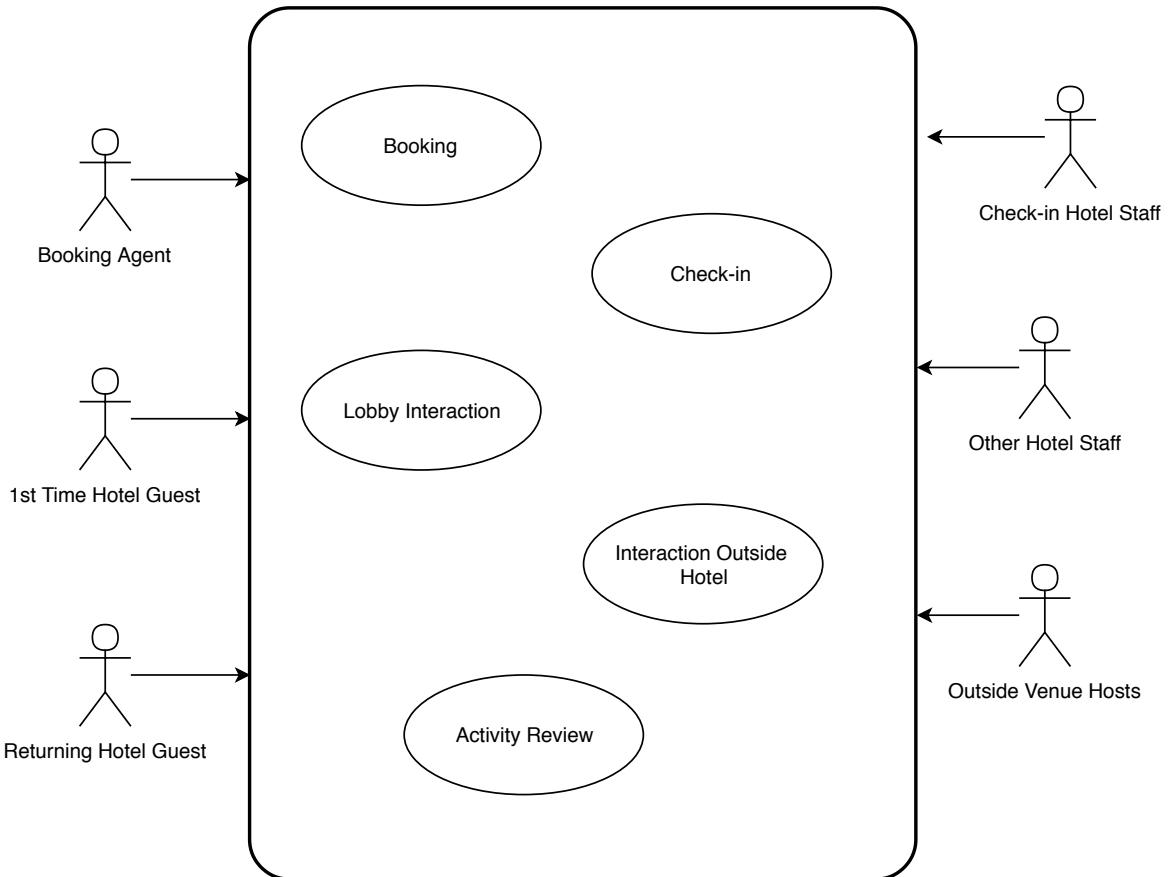


**HOW MIGHT WE...**

Source: Interaction Design Foundation

# Future Journey Map

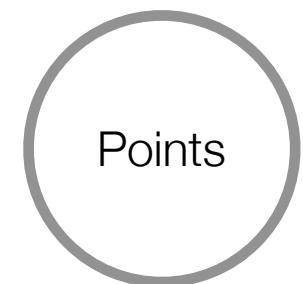
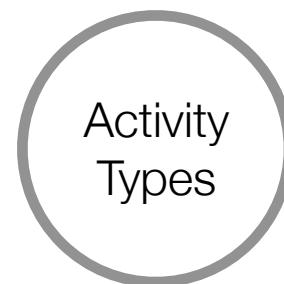
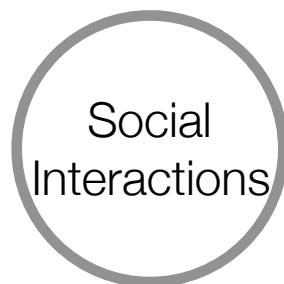
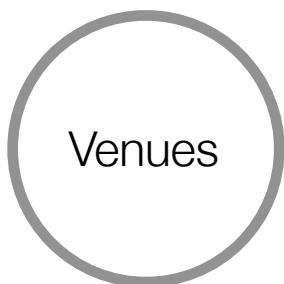
	BEGIN	CHALLENGE	RESPONSE	RETURN
PERSONA				
CONTEXT				
ARTEFACTS				
SCENARIO				



## Use Cases of a system

**Derive data entities from use cases.**

# Data Entities to be Tracked



- e.g.
  - 1st time guests
  - Returning guests
- e.g.
  - Starbuck
  - Bar inside hotel
  - Boston Metropolitan Museum
- e.g.
  - Add friends
  - Take pictures
  - Share rides
  - Split bills
- e.g.
  - Museum tour
  - Bar hopping
  - Scenic picture taking
  - Business meeting
- e.g.
  - Revisit
  - Dine in hotel
  - Shop in hotel
  - Initiate contact
  - Give reviews



## **THE SOLUTION (IN ONE SENTENCE):** **how & how much - value proposition**

## REFERENCE LINKS

### 1. Getting Started with Airtable

<https://www.youtube.com/watch?v=7C3zkkkhPY>

### 2. Using Views in Airtable to Improve Workflows

<https://www.youtube.com/watch?v=MyfMwDC3uhg>

### 3. What is Slack?

<https://www.youtube.com/watch?v=9RJZMSsH7-g>

### 4. Getting Started With GitHub

<https://www.youtube.com/watch?v=ci3W1T88mzw>

## PROBLEM SET #1

- Find a subject of interest to you (KPop, books, movies, fashion, traveling, etc.) and build a database using Airtable to study it.
- Create tables, build relationships, and use views (Calendar, Gallery, and Kanban) to display your contents (At least 10 entries).
- Share you Airtable base with me:  
[bernard@cuhk.edu.hk](mailto:bernard@cuhk.edu.hk)      Use commenter function

**THANK YOU FOR YOUR TIME!**