



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

| Design Thinking | Computational Thinking | Description |
|--------------------------|-------------------------------|--|
| 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 (who, what, and why). |
| 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 (how and how much). |

**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

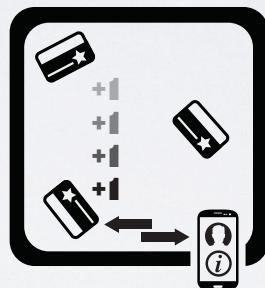


Joins loyalty program, creates a profile & installs phone app.

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

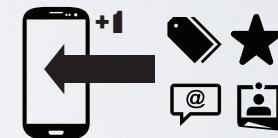
BOOKING

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

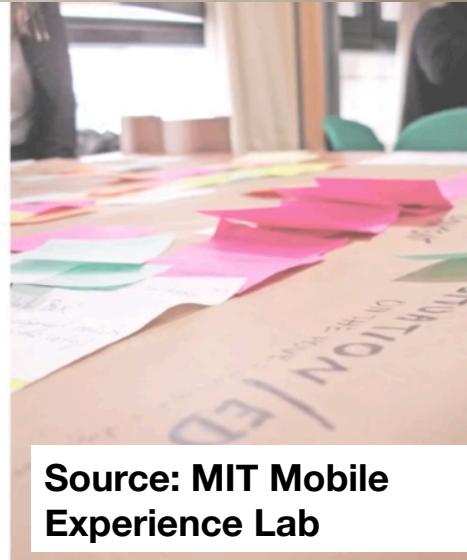
Gen Y travelers seeking personalized yet serendipitous experiences, good company to share them with, and the ability to capture and celebrate them.



PERSONA

bored lobbygoer in transition

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



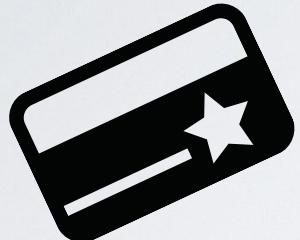
Source: MIT Mobile Experience Lab



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

Provide 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

Interact-
ion Data

Review
Data

Give
check
in point

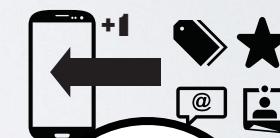
profile, activity, points

profile, activity, points

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

Data-
base

profile, activity,
points



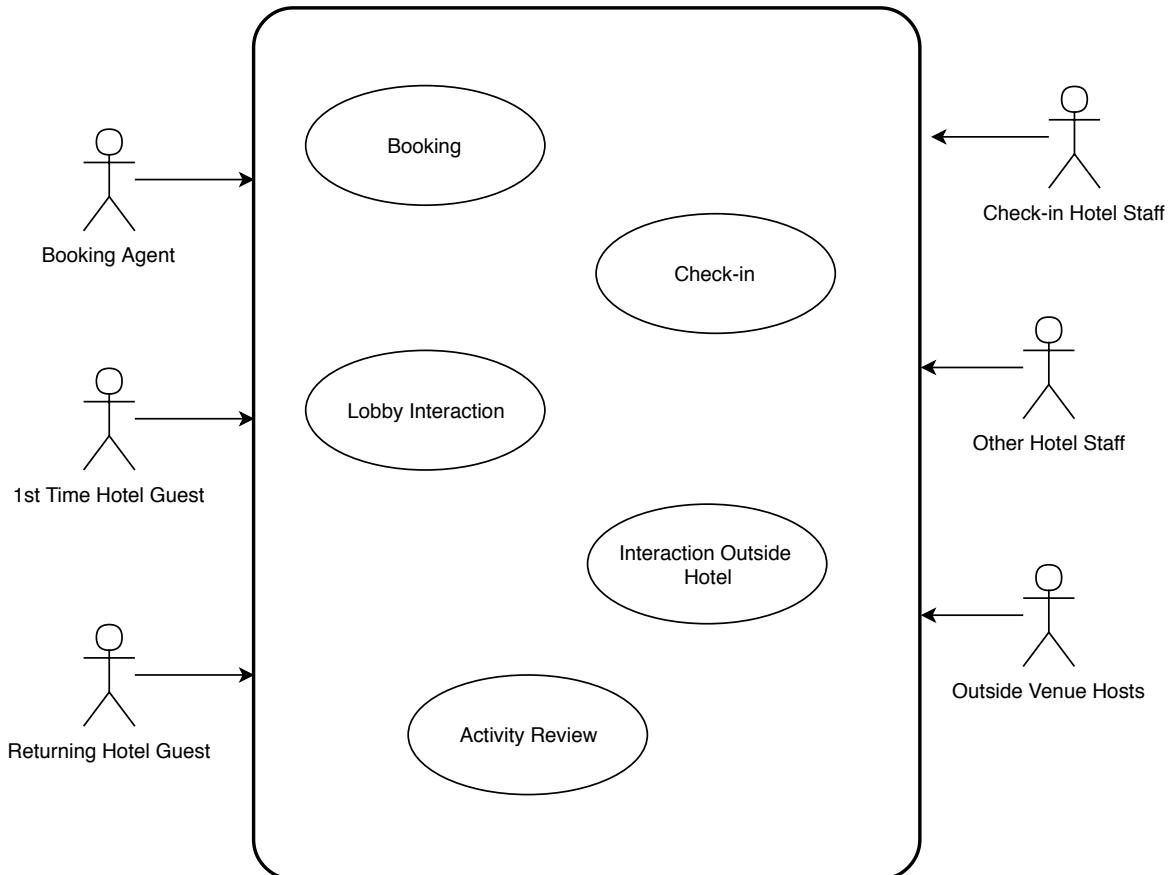
INTE
RAC
TIONS

OUTSI
DE

INTE
RAC
TIONS

OUTSI
DE

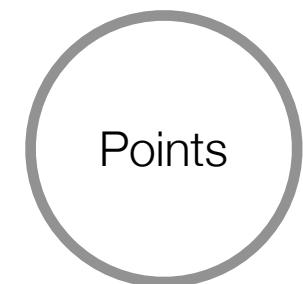
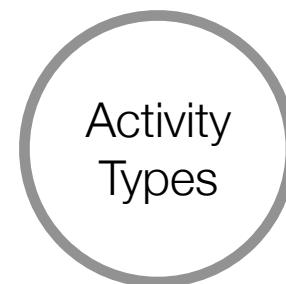
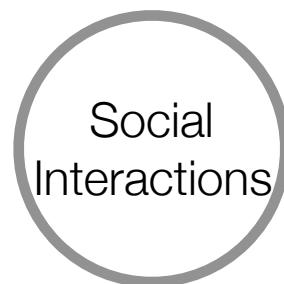
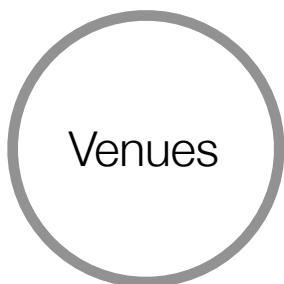
Develop use cases from journey map.



Use Cases of a Hotel Loyalty App

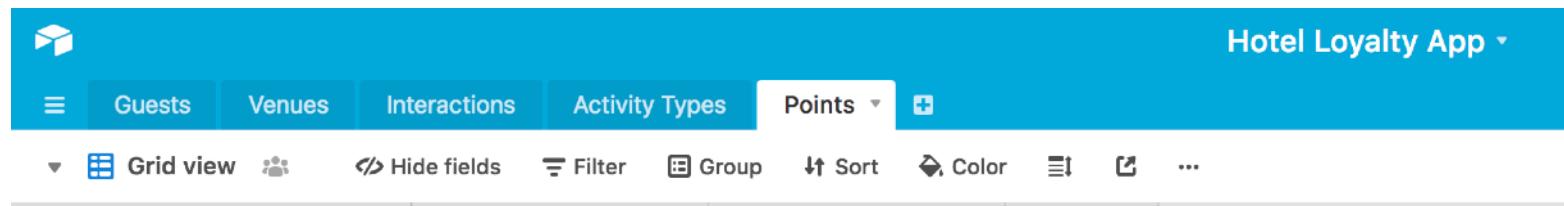
Derive data entities from use cases.

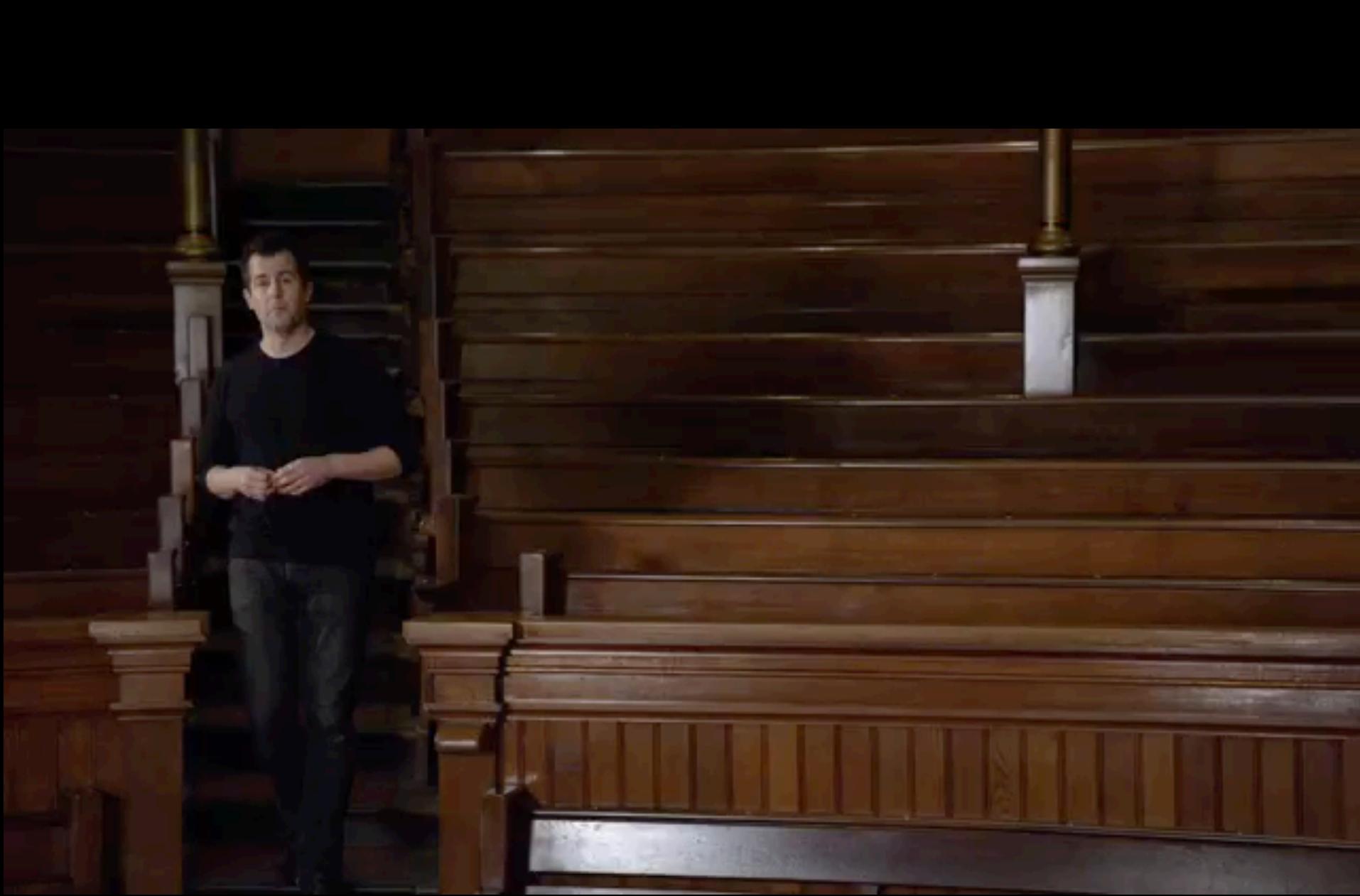
Data Entities to be Tracked



- 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



Product Blocks Templates Universe Pricing Sign in [Sign up](#)

Create, your way

Part spreadsheet, part database, and entirely flexible, teams use Airtable to organize their work, their way.

Enter your email address

[Get started](#)

Already using Airtable? [Sign in](#)



https://airtable.com/universe

Apps Cyberport Bootc... Blockchain NLP and Chatbot FinTech E-Commerce Classes Development Tools Data Science Machine Learning Music Drupal Cloud Providers Other Bookmarks

Airtable Bases Templates Universe HELP ? 🔍

[Search Universe](#)

Sort by featured ▾

CATEGORIES

- Featured
- Arts and culture
- Community and local interest
- Creative production
- Education
- Entrepreneurship
- Fashion and style
- Food and drink
- Government and politics
- Health and self-improvement
- Journalism and publishing
- Marketing and sales
- Nonprofits and volunteering
- Operations
- Product, design, and UX
- Products and consumer reviews
- Professional
- Real estate
- Science and technology
- Sports and games
- Travel and outdoors

Publish your own!

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

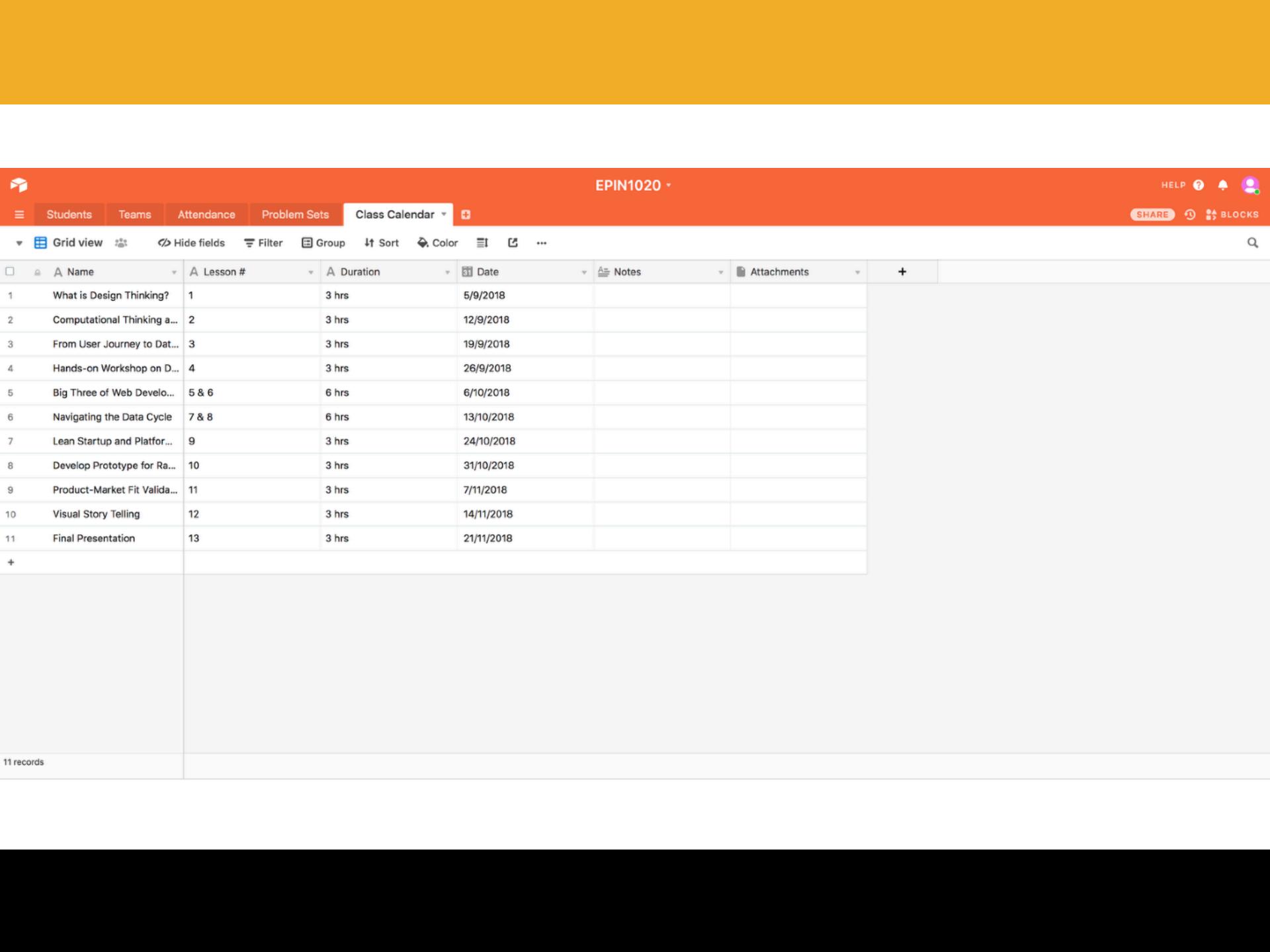
Britannica's Digital Content Management System

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

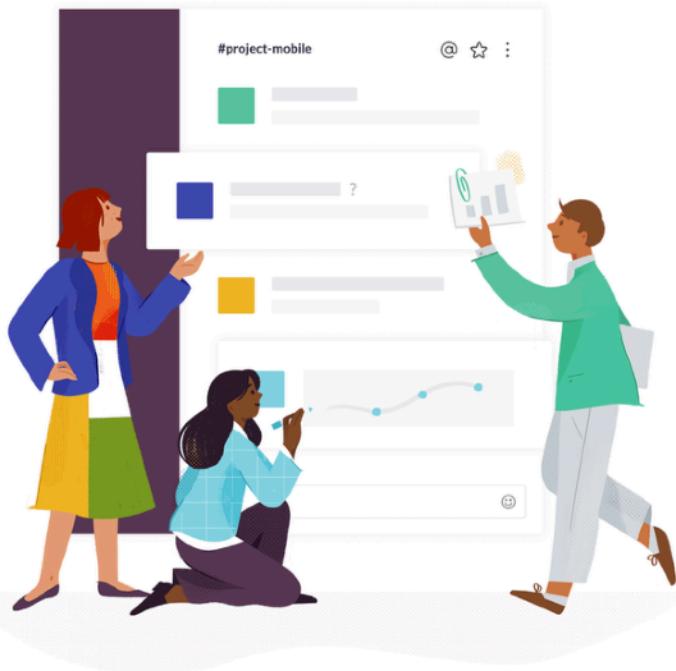
WORKING WITH YOUR TEAM FOR THE UPCOMING LESSONS

- **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



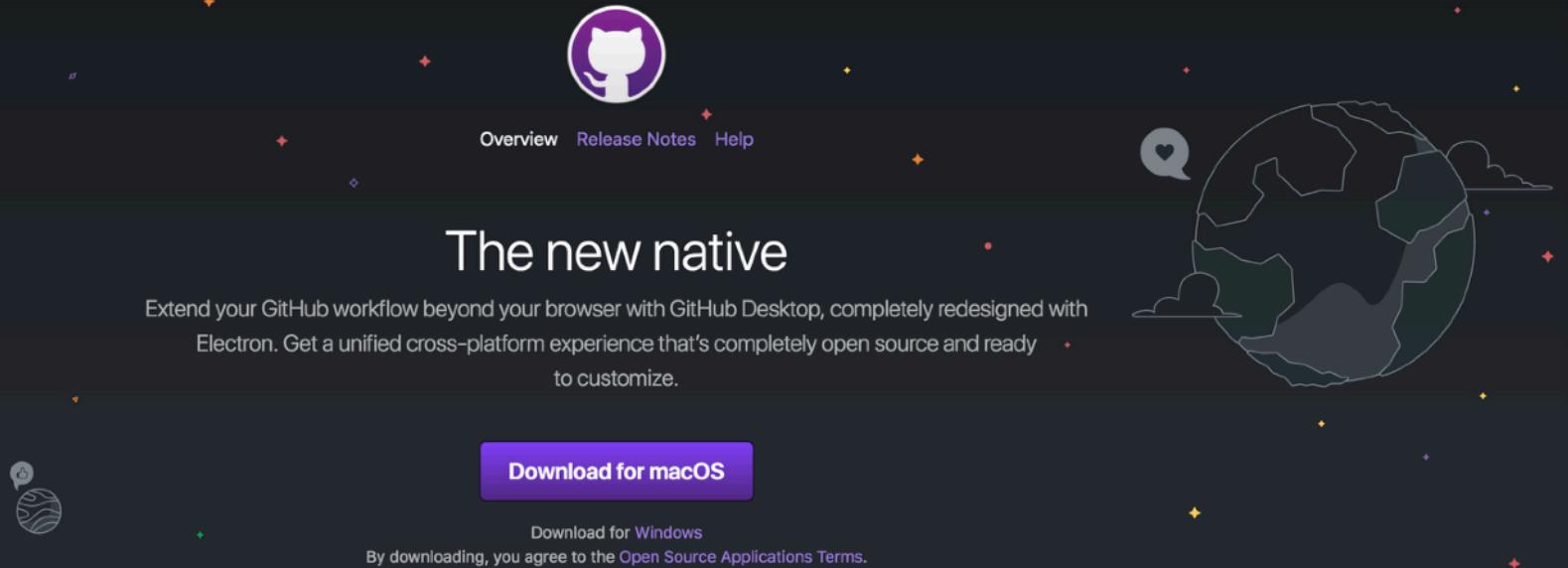
Where Work Happens

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.

[GET STARTED](#)

Already using Slack? [Sign in](#).

https://join.slack.com/t/epin-1020/shared_invite/enQtNDQyODMwMjE4NDg1LWQ0OTg2Y2E2ZDM2MTk3Y2NmYjU2OGNjMTc5MjljMjdkYzE5NTA5YjBjMDg1N2I1MGJIZGRjYTQ2Y2Q0N2YzYTM



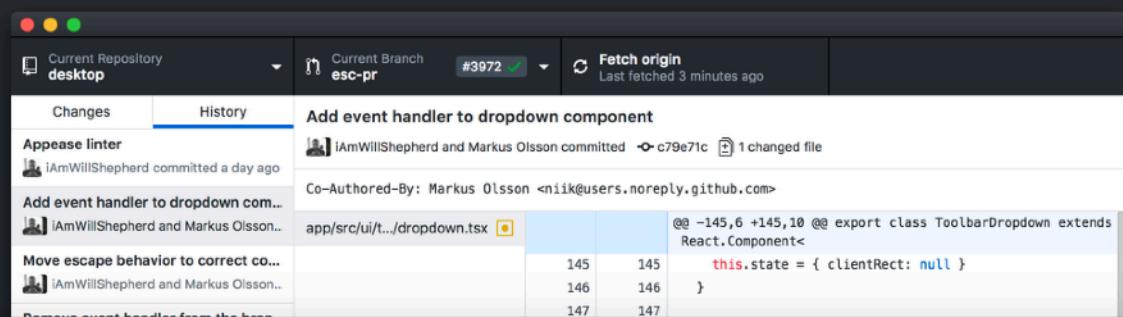
The new native

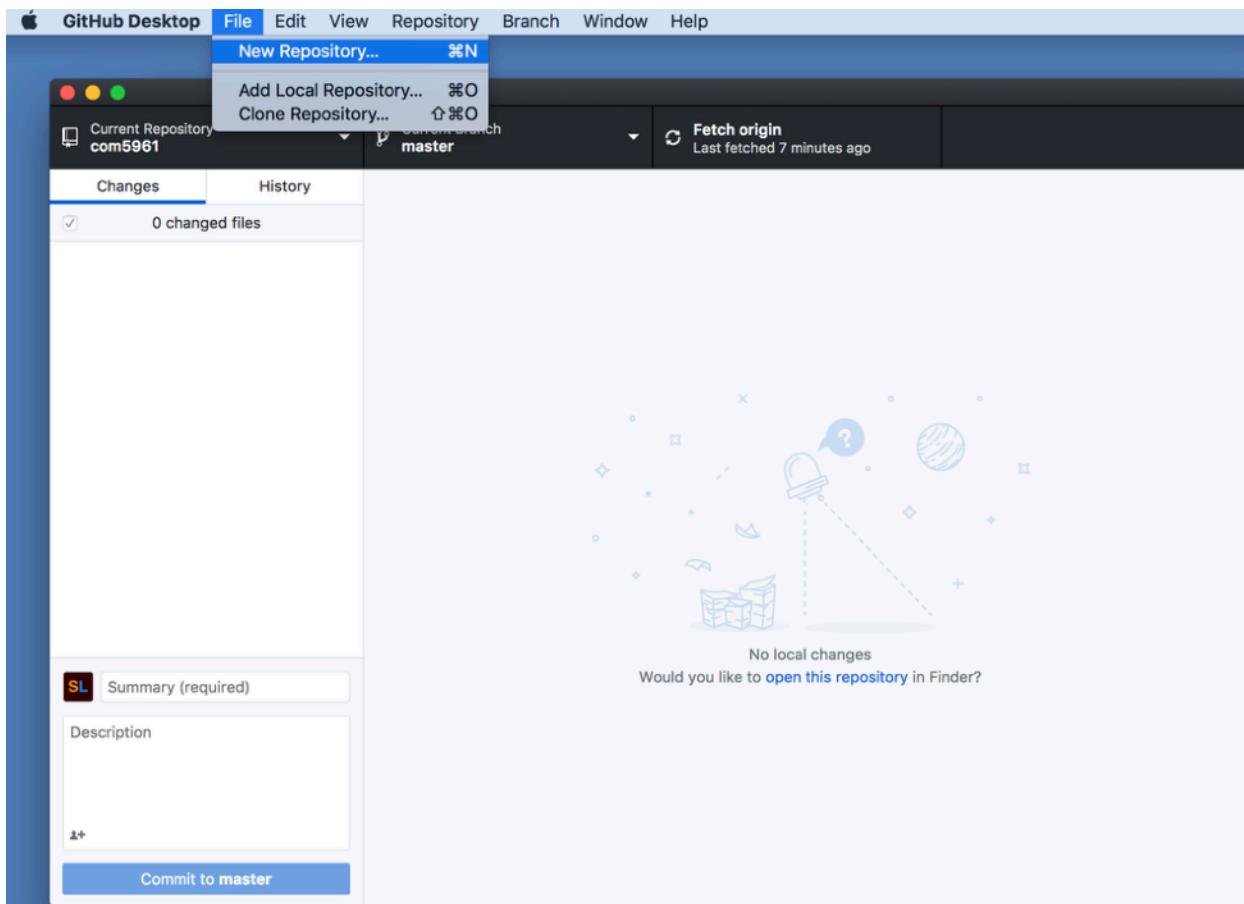
Extend your GitHub workflow beyond your browser with GitHub Desktop, completely redesigned with Electron. Get a unified cross-platform experience that's completely open source and ready to customize.

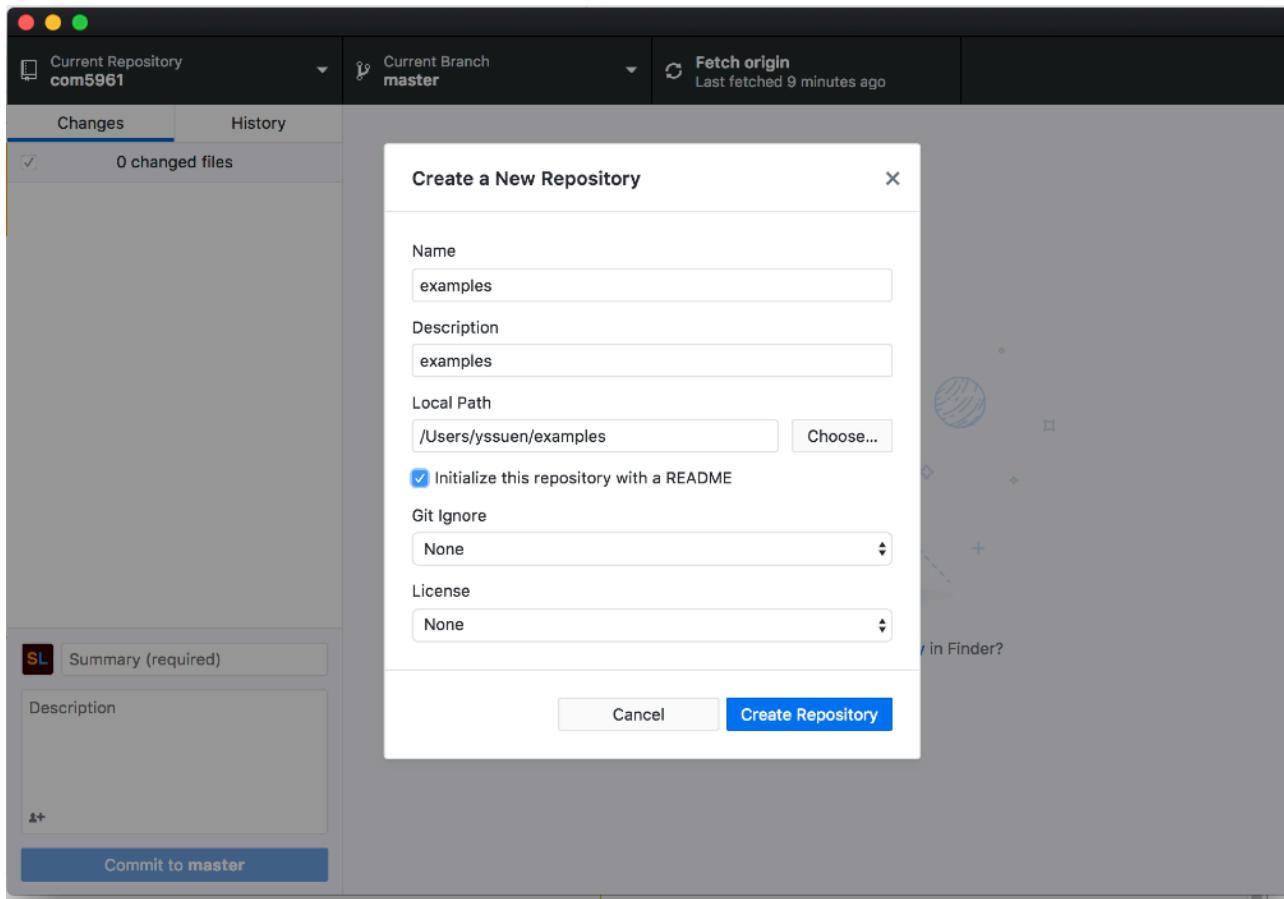
[Download for macOS](#)

[Download for Windows](#)

By downloading, you agree to the [Open Source Applications Terms](#).









Search or jump to...



Pull requests Issues Marketplace Explore



Overview

Repositories 2

Stars 0

Followers 0

Following 0

Popular repositories

COMM5961

1st

d

HTML

peachymissy

Follow

Block or report user

Joined 17 days ago

11 contributions in the last year



Learn how we count contributions.

Less More

Contribution activity

Jump to ▾

2018

September 2018



Search or jump to...



Pull requests Issues Marketplace Explore



MengrongXu / com5940

Watch 0

Star 0

Fork 0

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Insights

No description, website, or topics provided.

28 commits

1 branch

0 releases

1 contributor

Branch: master ▾

New pull request

Create new file

Upload files

Find file

Clone or download ▾

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 |



Search or jump to...



Pull requests Issues Marketplace Explore



MengrongXu / com5940

Watch 0

Star 0

Fork 0

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Insights

Branch: master

com5940 / assignment2 /

Create new file

Upload files

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

Jump to... All Threads

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

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

SHARE

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





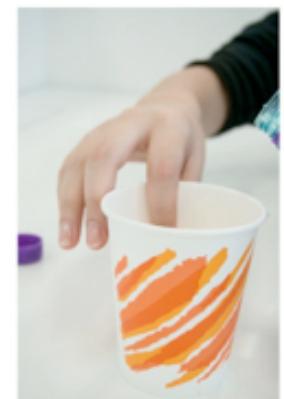
Source:Icon made by Zurb from www.flaticon.com

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

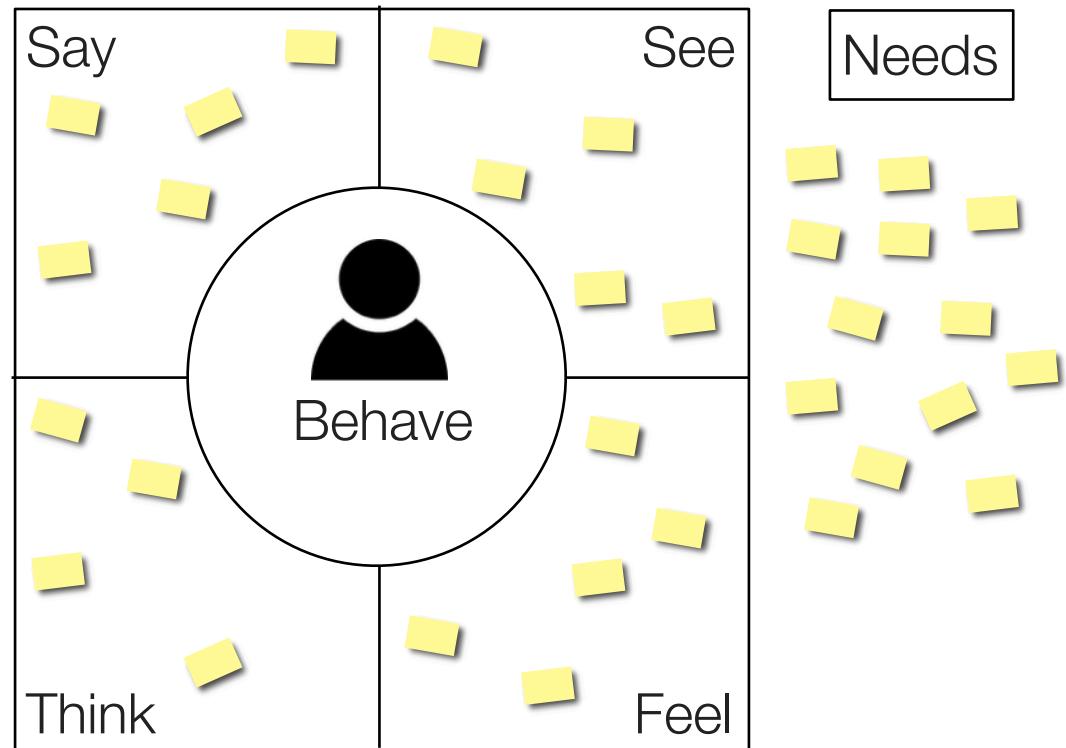
- Complete an empathy map of the persona given what the team has observed using post-it notes.
- Each team will present one's empathy map with the goal to discover insights on the problem and the limitations of current offering?
- You have 15 minutes to complete the map.

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.

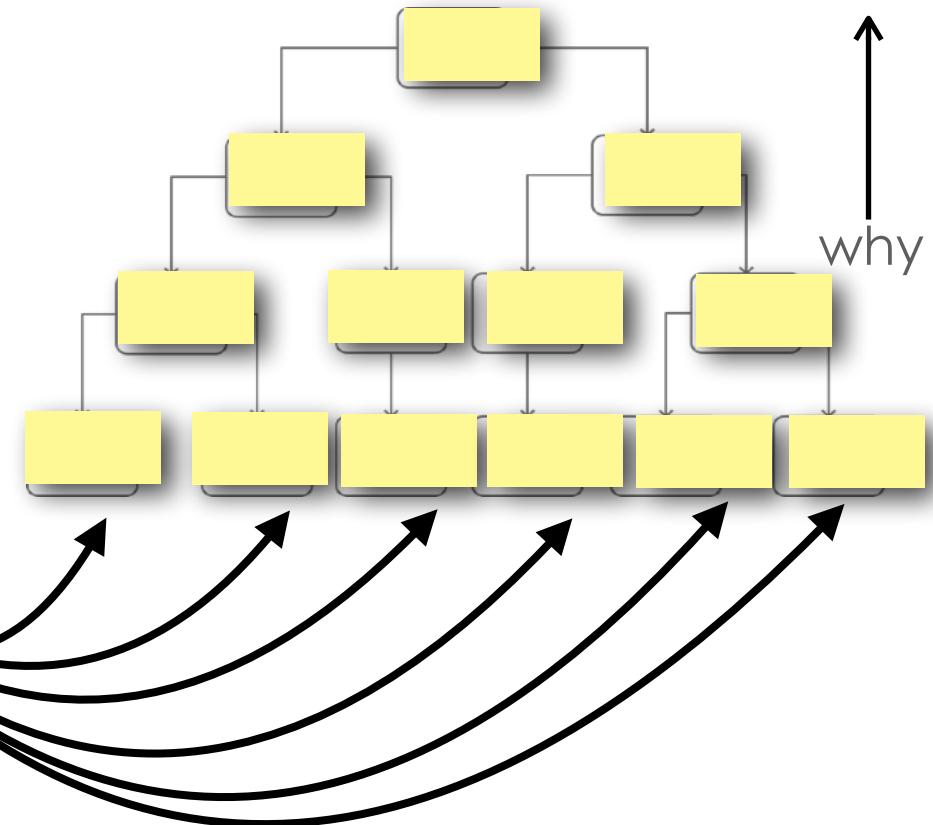
Source: Interaction Design Foundation



How/Why Laddering

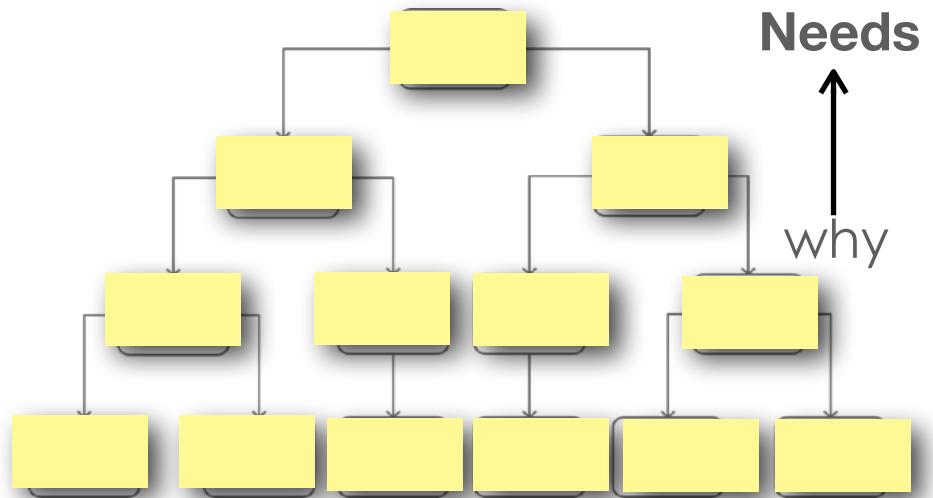


Source: Interaction Design Foundation



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.



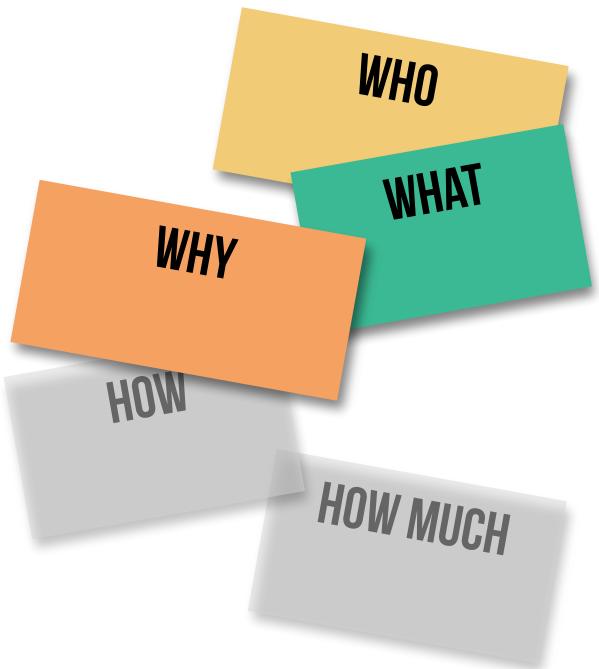
Source: Interaction Design Foundation

Current Journey Map

| | BEGIN | CHALLENGE | RESPONSE | RETURN |
|-----------|-------|-----------|----------|--------|
| PERSONA | | | | |
| CONTEXT | | | | |
| ARTEFACTS | | | | |
| SCENARIO | | | | |

Point of View

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



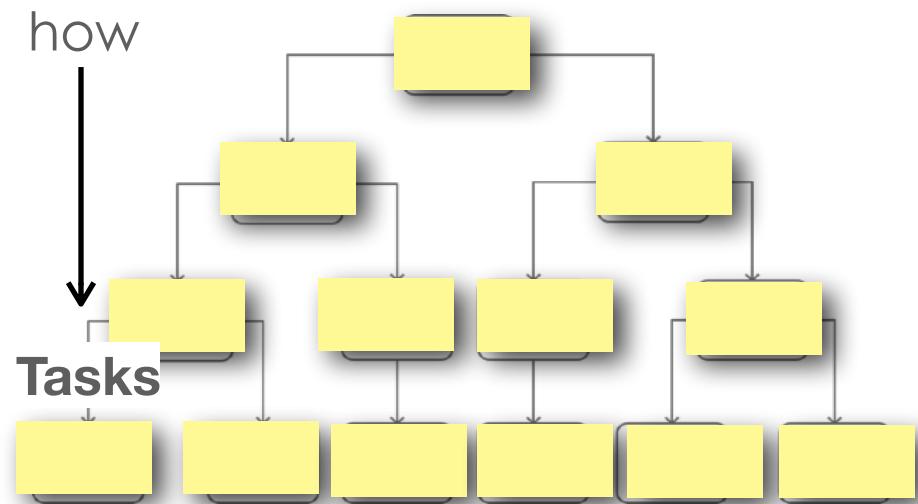
PROBLEM STATEMENT (IN ONE SENTENCE):

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.

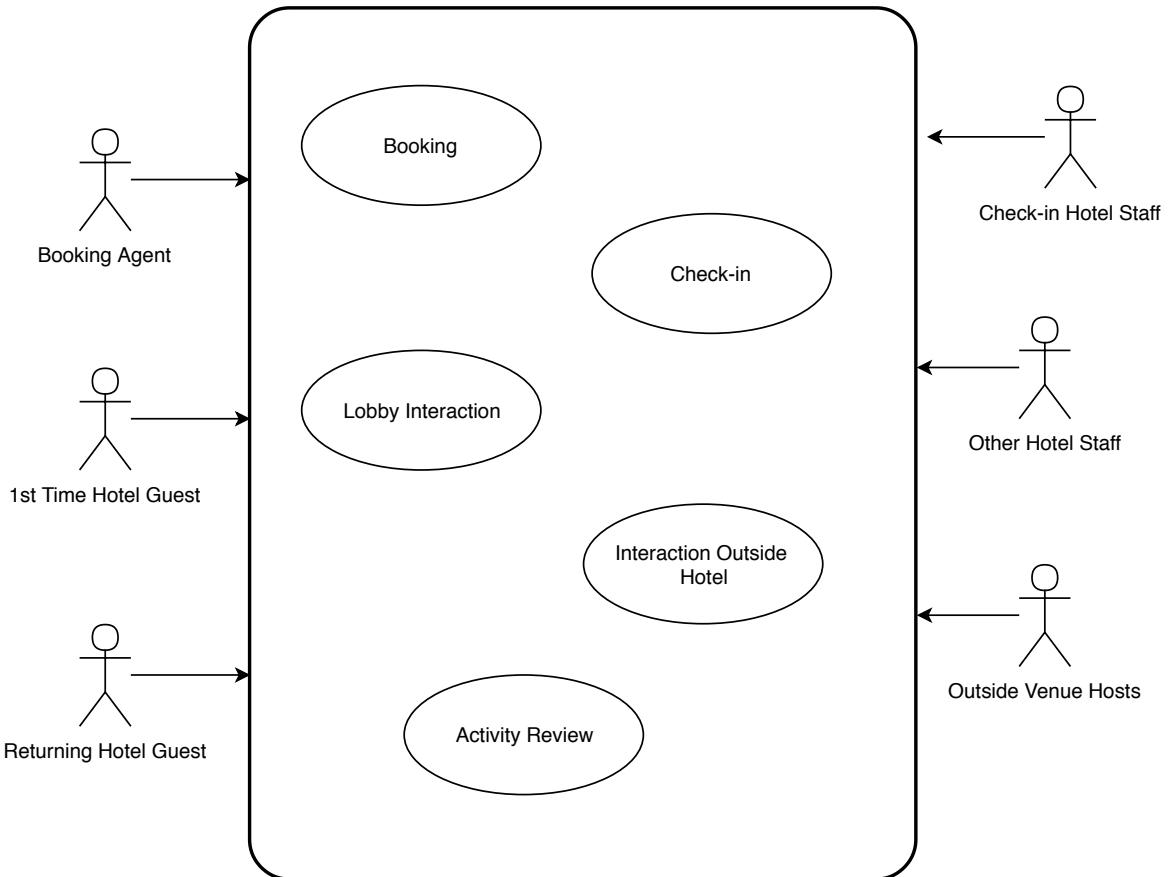


HOW MIGHT WE...

Source: Interaction Design Foundation

Future Journey Map

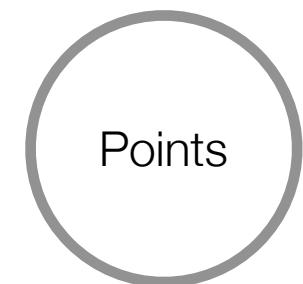
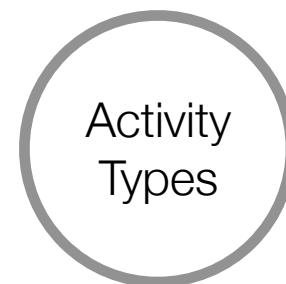
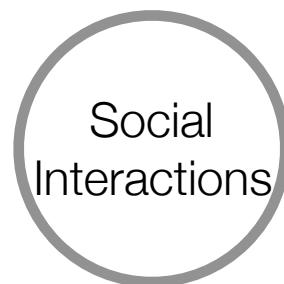
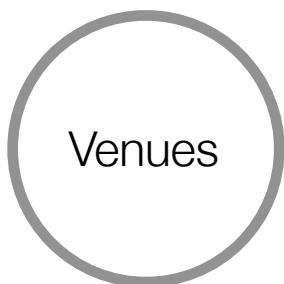
| | BEGIN | CHALLENGE | RESPONSE | RETURN |
|-----------|-------|-----------|----------|--------|
| PERSONA | | | | |
| CONTEXT | | | | |
| ARTEFACTS | | | | |
| SCENARIO | | | | |



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 your Airtable base with me:
bernard@cuhk.edu.hk Commenter
Half page write-up - why you pick up the subject

THANK YOU FOR YOUR TIME!