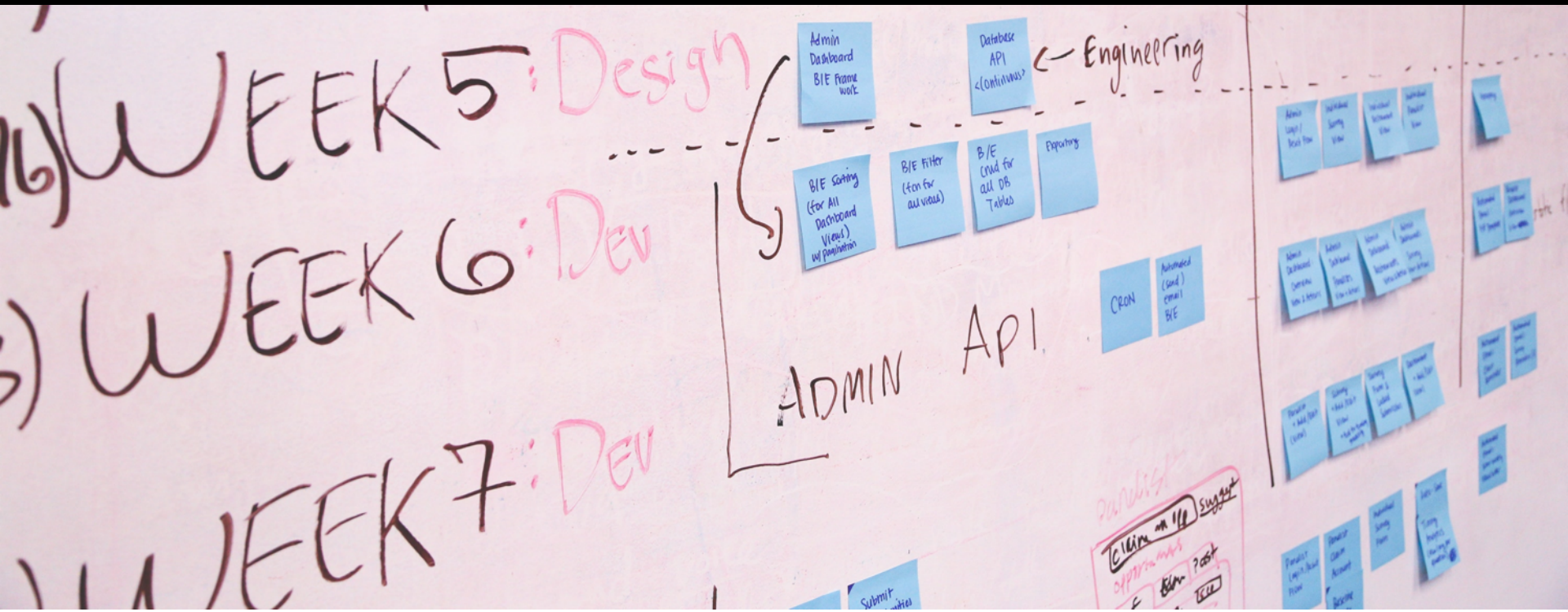


COM5961 DATA DRIVEN PRODUCTS & SERVICES DESIGN:
LESSON 5 - DESIGN THINKING FOR USER RESEARCH

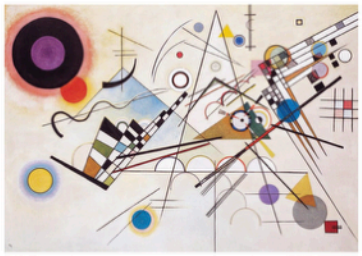
Bernard Suen
Center for Entrepreneurship
Chinese University of Hong Kong

Review assignment #1 and key concepts learned last week.

All Journals

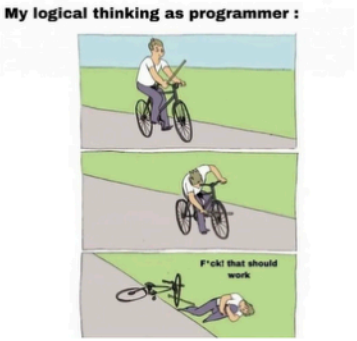
SQL is a Great Tool for Data Analysis

Scraping is a useful source for obtaining data among the various methods that are available out there. Nevertheless, the work Read more



Assignment I: When All Hell Breaks Loose

Hi, I'm Page. Personally I call myself Pagius, which is the latin origin of "page", and its meaning is "servant". Read more



How well do you know about...um...boxes?

Read more

My FIRST HTML assignment

Hello everyone, here is Leon. This is my first assignment, and I hope we can learn from each other and Read more

My first attempt on a website

Hello to those of you reading this. My name is Chen Taoyu, and this is the first website that I Read more

Feels Like Riding On A Roller Coaster

Hi everyone! I would like to my share my design process and some encountered difficulties when I was developing my Read more

SEMbyotic

Agency

SEMbyotic > Customer Experience > File Naming Conventions – Best Practices for Web & SEO

File Naming Conventions – Best Practices for Web & SEO

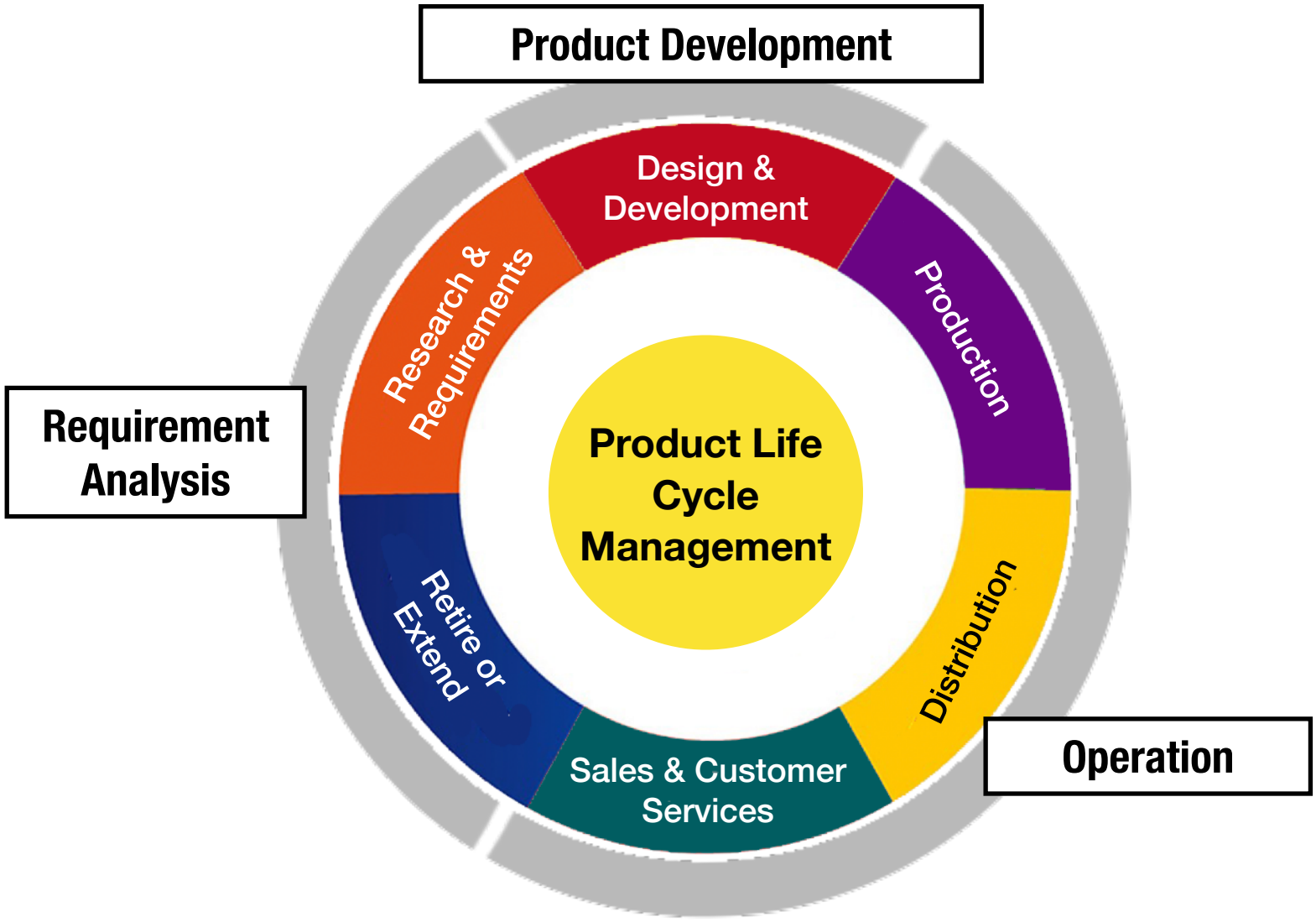
February 15, 2018 Adam Koontz no comments

https://sembyotic.com/file-naming-best-practices-websites/

A PM's Work Context for Using the MVC Framework

Essential Roles of a Product Manager

Product Life Cycle Management

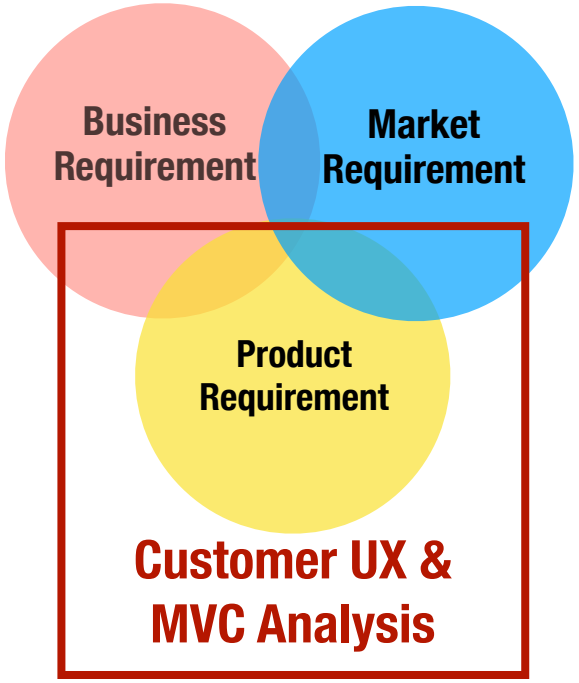

Product Development
Design & Development
Production
Distribution
Sales & Customer Services
Retire or Extend
Research & Requirements
Requirement Analysis
Product Life Cycle Management
Operation

Essential Roles of a Product Manager

Requirement Analysis 需求分析

Company Strategy & Business Model Analysis

業務需求



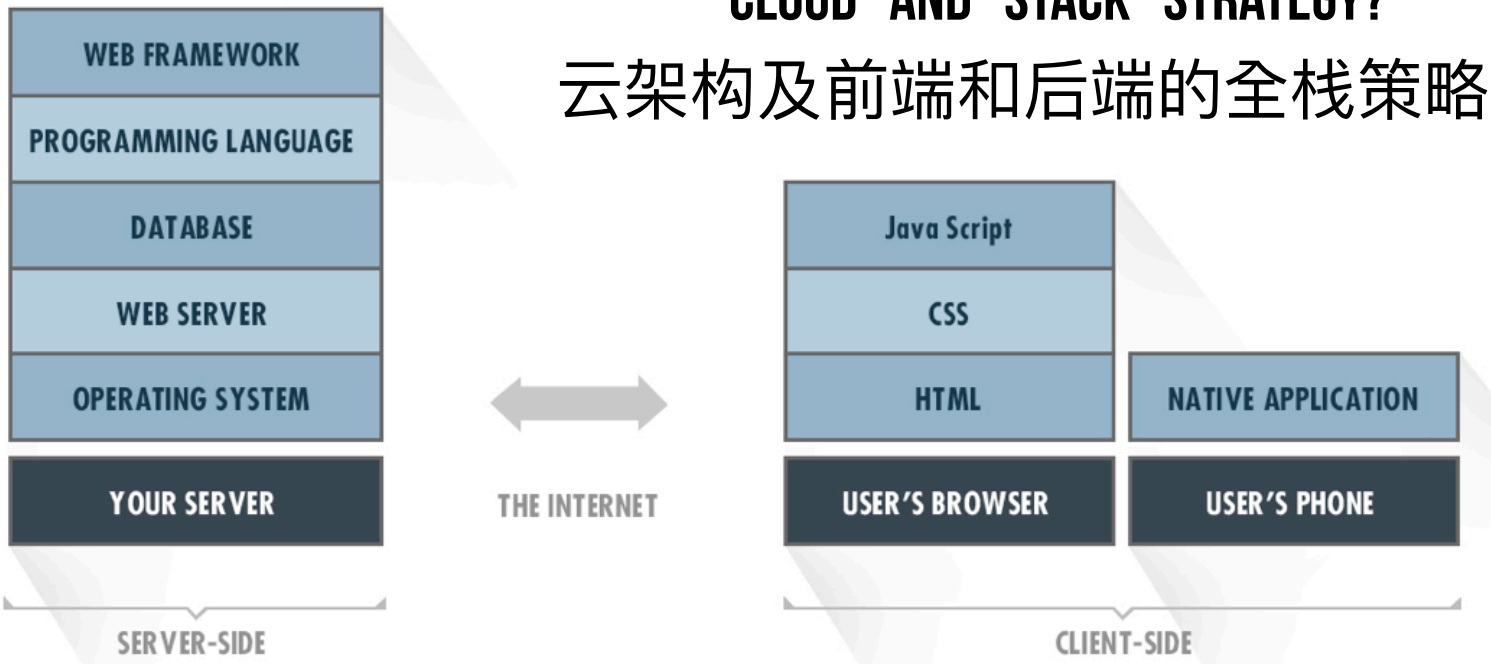
產品需求

Competitors & Market Analysis

市場需求

“CLOUD” AND “STACK” STRATEGY?

云架构及前端和后端的全栈策略

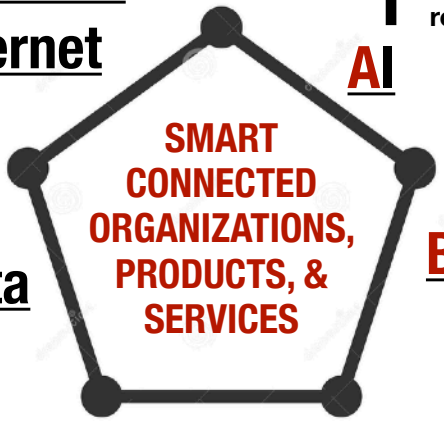


BACK-END TECHNOLOGY

后台

FRONT-END TECHNOLOGY

前台



Embodied Internet

- Augment Reality
- Virtual Reality
- Mixed Reality
- Avartar Tech
- Embient & Experience Tech
- Metaverse

AI

- Personalise content
- Recommend content and products
- Segment and match members
- Detect transaction fault and business risks
- Predict sales growth and optimise inventory
- ML/DL enabled UI (e.g. face, voice, and fingerprint recognition)

Big Data

- Assemble structured & unstructured customer data for profiling trends
- Add smart devices & data to network
- Build enterprise data warehouse and data lake
- Enable streaming services

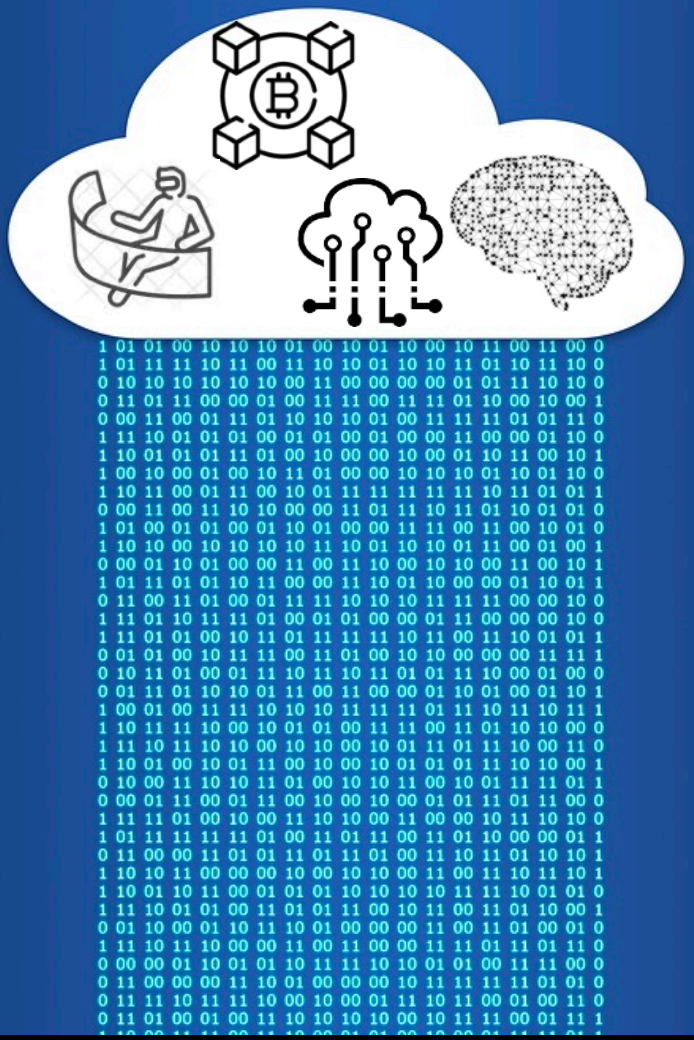
Blockchain

- Token economics
- Disintermeded, decentralized, and distributed architecture
- Smart contracts
- Immutable and traceable
- Crypto-currency
- Web 3.0

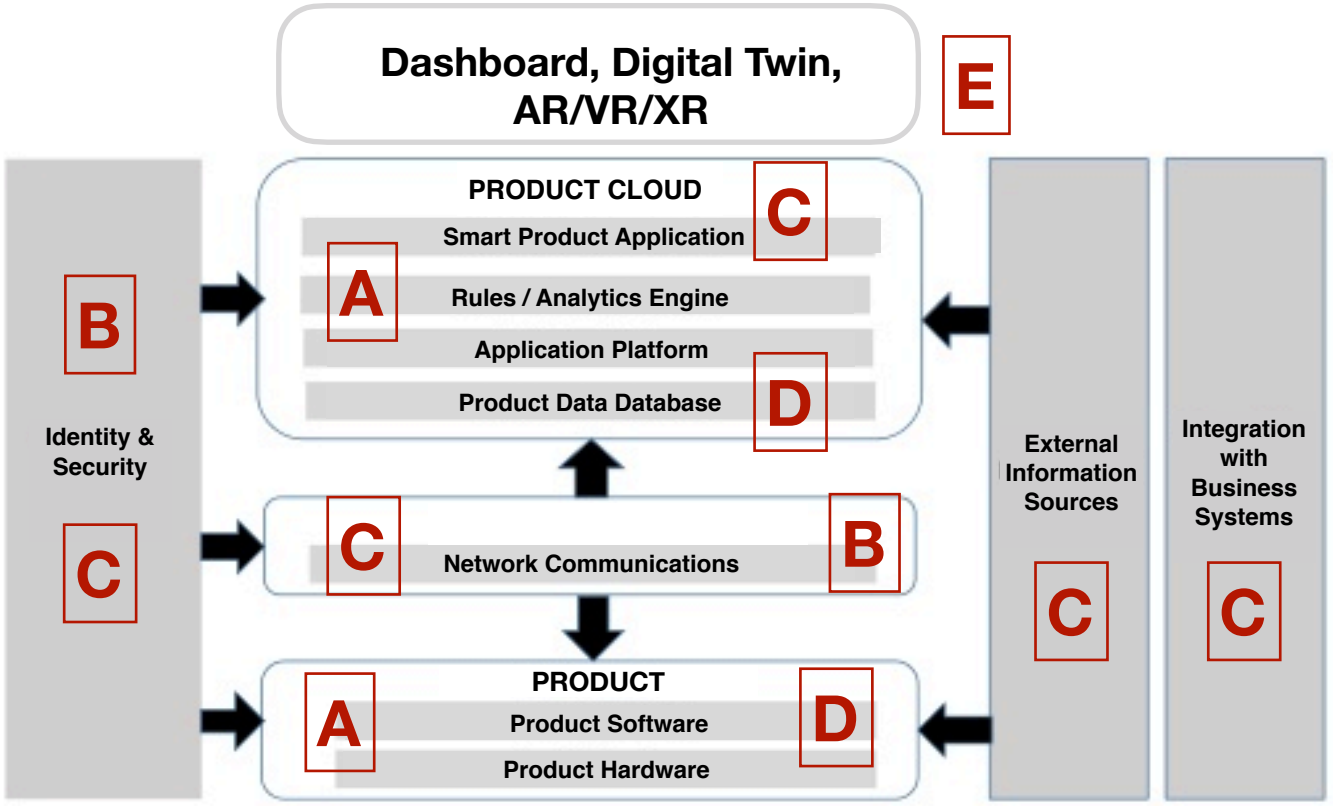
Cloud Computing & Cyber Security

- Outsource data storage and computing
- Outsource hardware maintenance and upgrade
- Outsource IoT, big data and machine learning infrastructure
- Scale up flexibility
- Leverage container/serverless tech
- Encryption, authentication, authorization, and firewall
- Infrastructure and biometric security
- Cyber security audit & disaster recovery

Digital Infrastructure

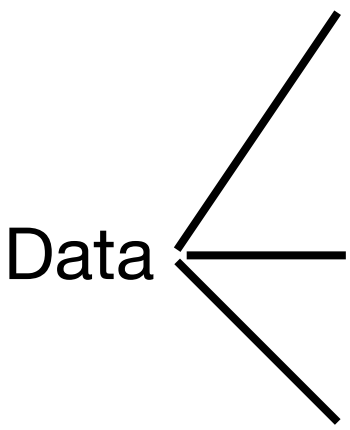


Technology Stack

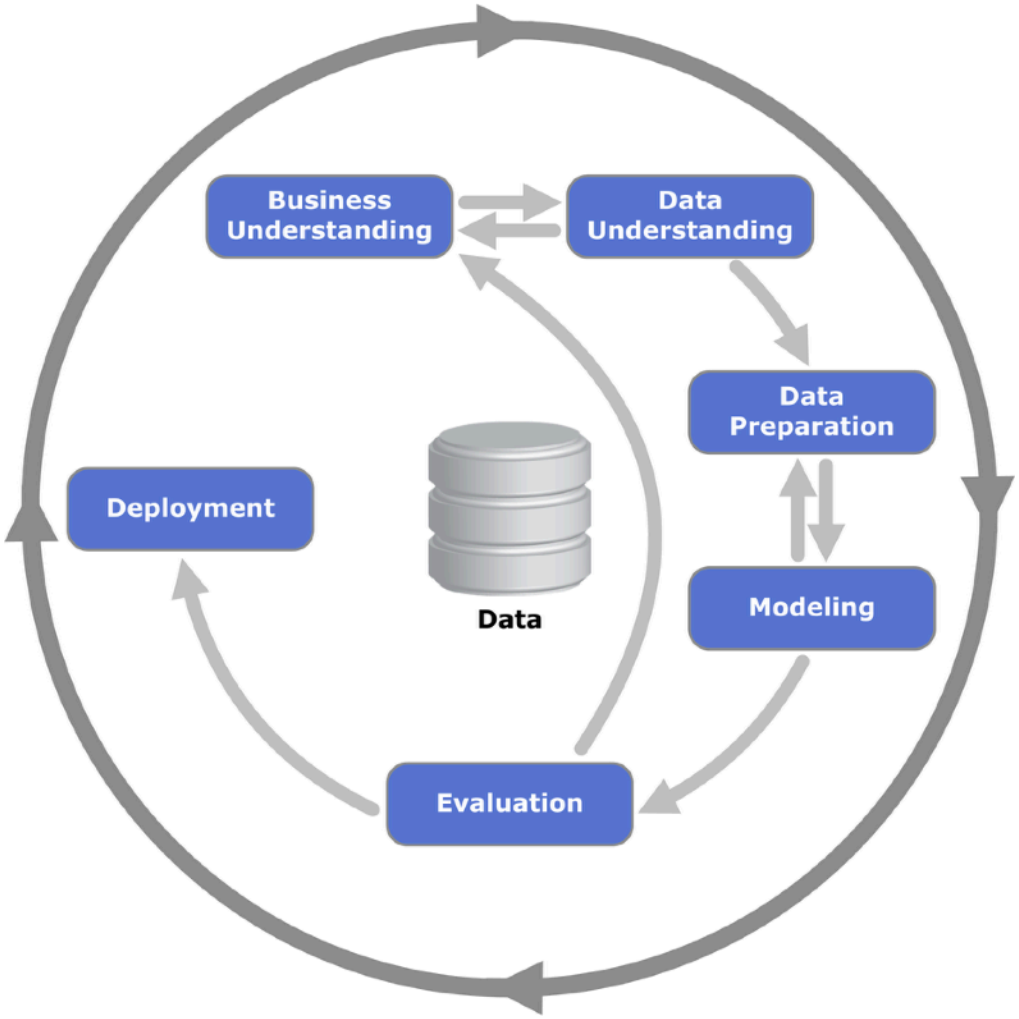


Source: Connected Product Transform Business by Michael E. Porter & James E. Heppelmann. Harvard Business Review

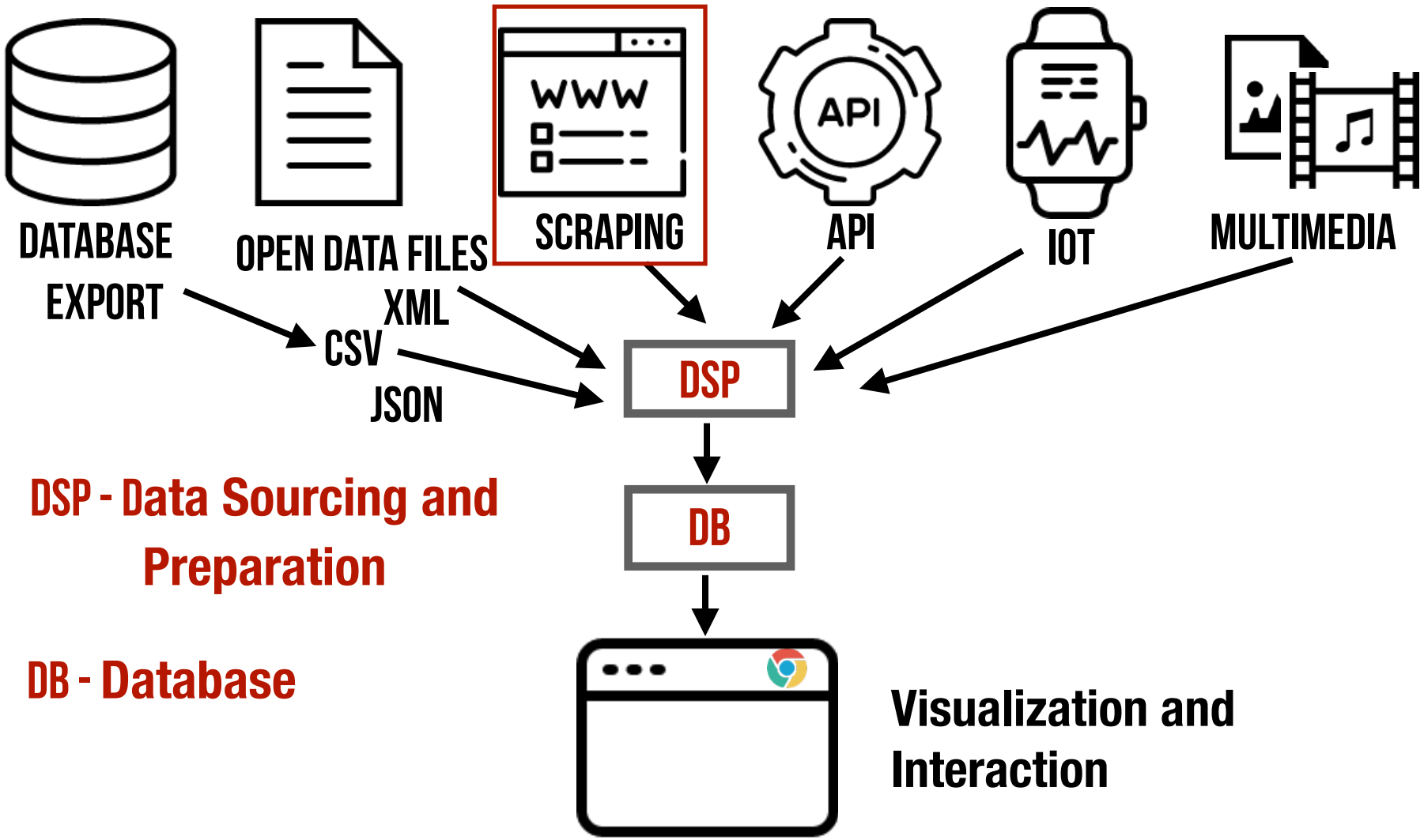
Three Major Functions of Data Use



1. Validating market needs and business opportunities (e.g. user & market research)
2. Using data to inform design, development, and testing (e.g. prioritize features release)
3. Preparing data for deployment and operation (e.g. marketing, sales, and customer services)



CRoss Industry Standard Process for Data Mining

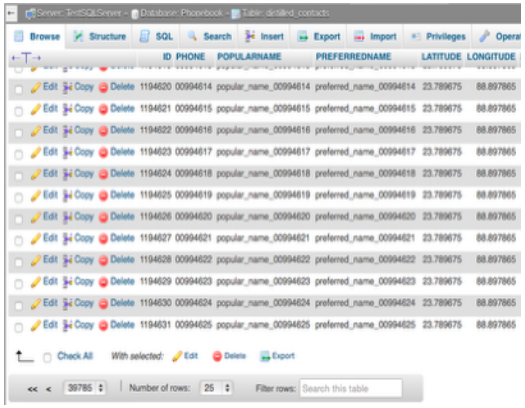

DATABASE EXPORT
OPEN DATA FILES
XML
CSV
JSON
WWW
SCRAPING
API
API
IOT
MULTIMEDIA
DSP
DB
DSP - Data Sourcing and Preparation
DB - Database
Visualization and Interaction

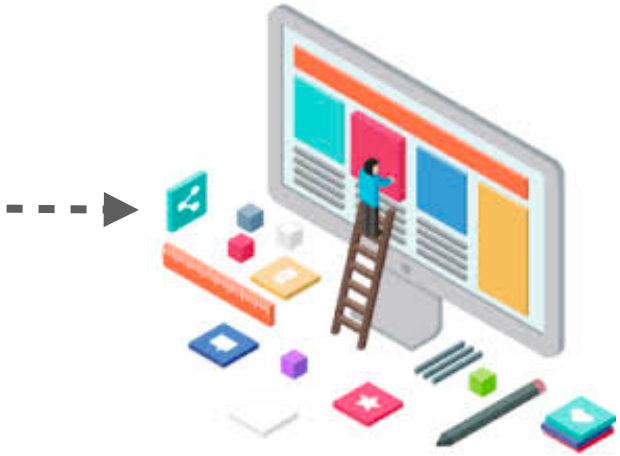
Data

Web Publishing

Web

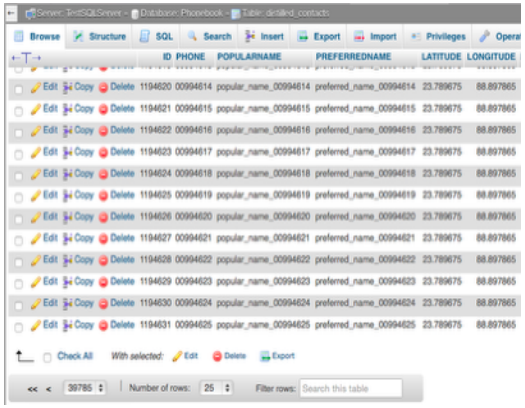
Dynamic Web Building



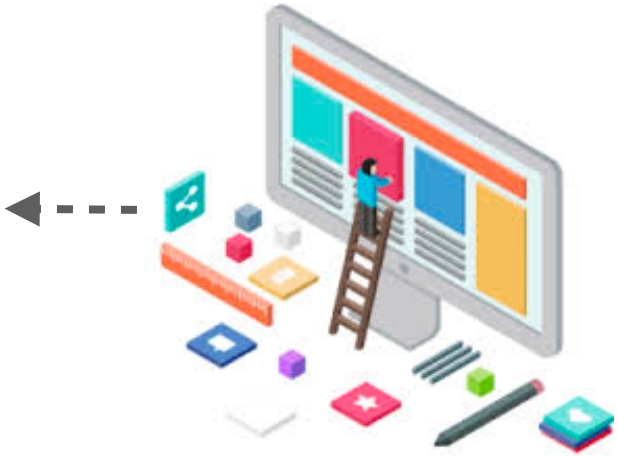


Static Web Building

Data



Web Scraping



Web

https://www.parsehub.com

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

parsehub

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A web scraping tool that is easy to use

ParseHub is a free web scraping tool. With our advanced web scraper, extracting data is as easy as clicking the data you need.

Download our free app

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Open a website

Download our desktop app. Choose a site to scrape data from.

Click to select data

Get data from multiple pages. Interact with AJAX, forms, dropdowns, etc.

Download results

Access data via JSON, Excel and API. Data is collected by our servers.

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OpenRefine

A free, open source, powerful tool for working with messy data

Download

On this page you will find a list of OpenRefine distributions and extensions available for download. Are we missing something? Want to fix a typo? You can submit changes.

Official Distribution

Read the installation instructions.

You can also download all official releases and source from our GitHub releases page

OpenRefine 3.5.2

The latest stable release of OpenRefine 3.5, released on January 26, 2021. Please backup your workspace directory before installing and report any problems that you encounter. A change log is provided on the release page.

- **Windows kit**, This requires Java to be installed on your computer. Download, unzip, and double-click on *openrefine.exe* or *refine.bat* if the former does not work.
- **Windows kit with embedded Java**, includes OpenJDK Java, available under the GPLv2+CE license. Download, unzip, and double-click on *openrefine.exe* or *refine.bat* if the former does not work.
- **Mac kit**, Download, open, drag icon into the Applications folder and double click on it. You do not need to install Java separately.
- **Linux kit**, Download, extract, then type *./refine* to start. This requires Java to be installed on your computer.

OpenRefine 3.4.1

The previous stable release of OpenRefine, released on September 24, 2020. Please backup your workspace directory before installing and report any problems that you encounter. A change log is provided on the release page.

- **Windows kit**, This requires Java to be installed on your computer. Download,

https://openrefine.org/download.html

Legal and Ethical Considerations.

scraping and how they play out.

Is Web Scraping Legal?

Your first thought might be to look at the legal side of things.

The truth is that the legality of web scraping is still relatively up in the air.

Meaning that there are currently no specific laws that refer to the legality of web scraping. So it is neither legal or illegal.

https://www.parsehub.com/blog/web-scraping-ethical/

Scraping Publicly Available Information

Another factor to keep in mind is the type of data you'd be scraping. In our case, we always refer to publicly available data.

This is data that has been made public by the owner of said data. Private and leaked information is not considered publicly available information.

Ethics in Web Scraping

James Densmore Jul 23, 2017 · 3 min read

We all scrape web data. Well, those of us who work with data do. Data scientists, marketers, data journalists, and the data curious alike. Lately, I've been thinking more about the ethics of the practice and have been dissatisfied by the lack of consensus on the topic.

Let me be clear that I'm talking **ethics** not the law. The law in regards to scraping web data is complex, fuzzy and ripe for reform, but that's another matter. It's not that no one is thinking, or writing, about the ethics in scraping but rather that both those scraping and those being scraped can't

https://towardsdatascience.com/ethics-in-web-scraping-b96b18136f01

WRITTEN BY
James Densmore
Data Science and Data Engineering Consultant at Data Liftoff
https://www.datalifto ff.com

Follow

The Ethical Scraper

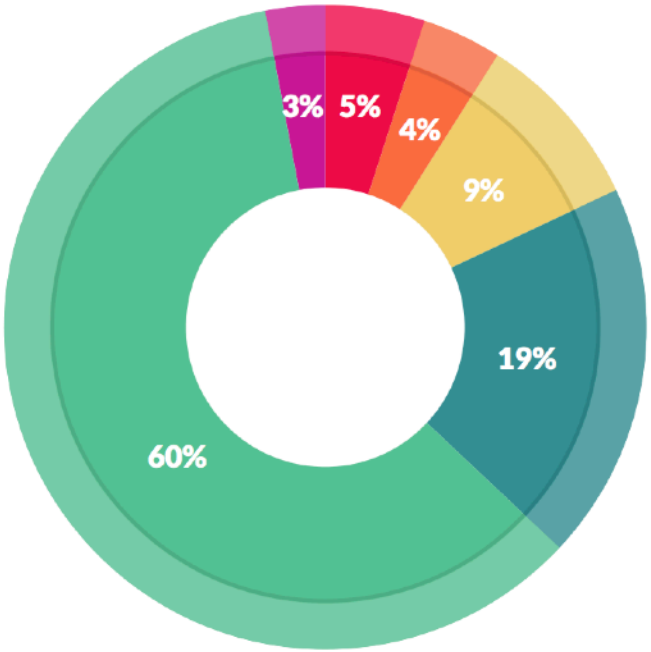
I, the web scraper will live by the following principles:

- If you have a public API that provides the data I'm looking for, I'll use it and avoid scraping all together.
- I will always provide a User Agent string that makes my intentions clear and provides a way for you to contact me with questions or concerns.
- I will request data at a reasonable rate. I will strive to never be confused for a DDoS attack.
- I will only save the data I absolutely need from your page. If all I need it OpenGraph meta-data, that's all I'll keep.
- I will respect any content I do keep. I'll never pass it off as my own.
- I will look for ways to return value to you. Maybe I can drive some (real) traffic to your site or credit you in an article or post.
- I will respond in a timely fashion to your outreach and work with you towards a resolution.
- I will scrape for the **purpose of creating new value from the data**, not to duplicate it.

1. **Fair use principle** (https://www.bl.uk/business-and-ip-centre/articles/fair-dealing-copyright-explained)
2. **Fair use checklist** (https://copyright.columbia.edu/content/dam/copyright/Precedent%20Docs/fairusechecklist.pdf)
3. **Fair use in text and data mining** (https://www.arl.org/wp-content/uploads/2015/06/TDM-5JUNE2015.pdf)
4. **Business use cases for web scraping** (https://www.webscrapingapi.com/web-scraping-business-use-cases/)

How a Data Scientist Spends Their Day

Here's where the popular view of data scientists diverges pretty significantly from reality. Generally, we think of data scientists building algorithms, exploring data, and doing predictive analysis. That's actually not what they spend most of their time doing, however.



What data scientists spend the most time doing

- *Building training sets: 3%*
- *Cleaning and organizing data: 60%*
- *Collecting data sets; 19%*
- *Mining data for patterns: 9%*
- *Refining algorithms: 4%*
- *Other: 5%*

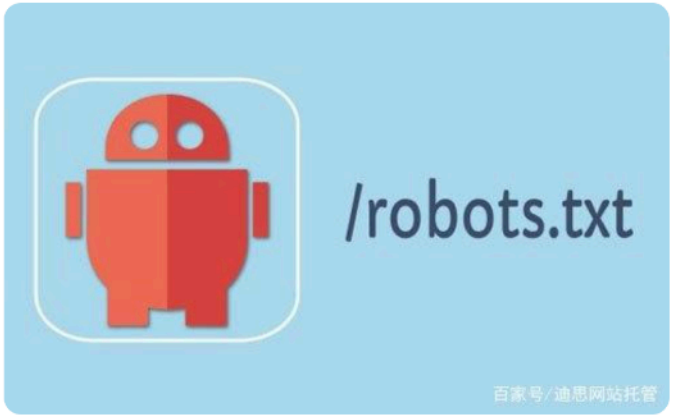
Source: Data Science 2016 Report by CrowdFlower

robots.txt文件的作用及写法

迪思网站托管

发布时间: 18-11-06 15:46

Robots协议（也称为爬虫协议、机器人协议等）的全称是“网络爬虫排除标准”（Robots Exclusion Protocol），网站通过Robots协议告诉搜索引擎哪些页面可以抓取，哪些页面不能抓取。



Robots.txt文件的重要性

robots.txt是搜索引擎蜘蛛访问网站时要查看的第一个文件，并且会根据robots.txt文件的内容来爬行网站。在某种意义上说，它的一个任务就是指导蜘蛛爬行，减少搜索引擎蜘蛛的工作量。

Source: https://baijiahao.baidu.com/s?id=1616368344109675728&wfr=spider&for=pc

Most Basic Data Cleaning and Wrangling Tasks

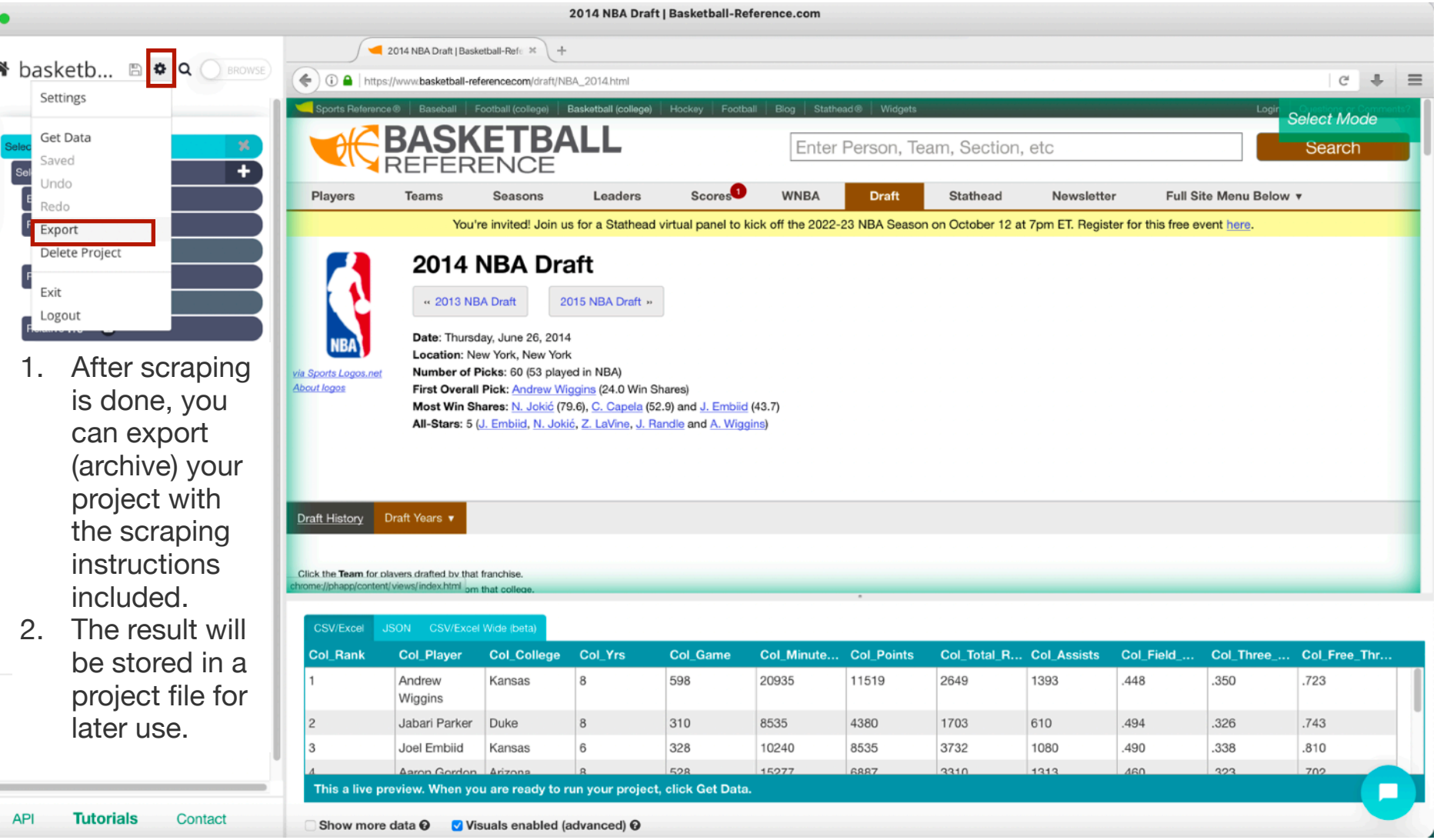
1. Remove blanks
2. Remove duplicates
3. Resolve inconsistent entries
4. Transform incorrect data (e.g. wrong data types such as text instead of numeric and calculations)
5. Rename, combine and split columns for making further data presentation and processing easier
6. Impute missing entries (need expertise to judge usage instead of relying on statistics alone)

Problem Set #2

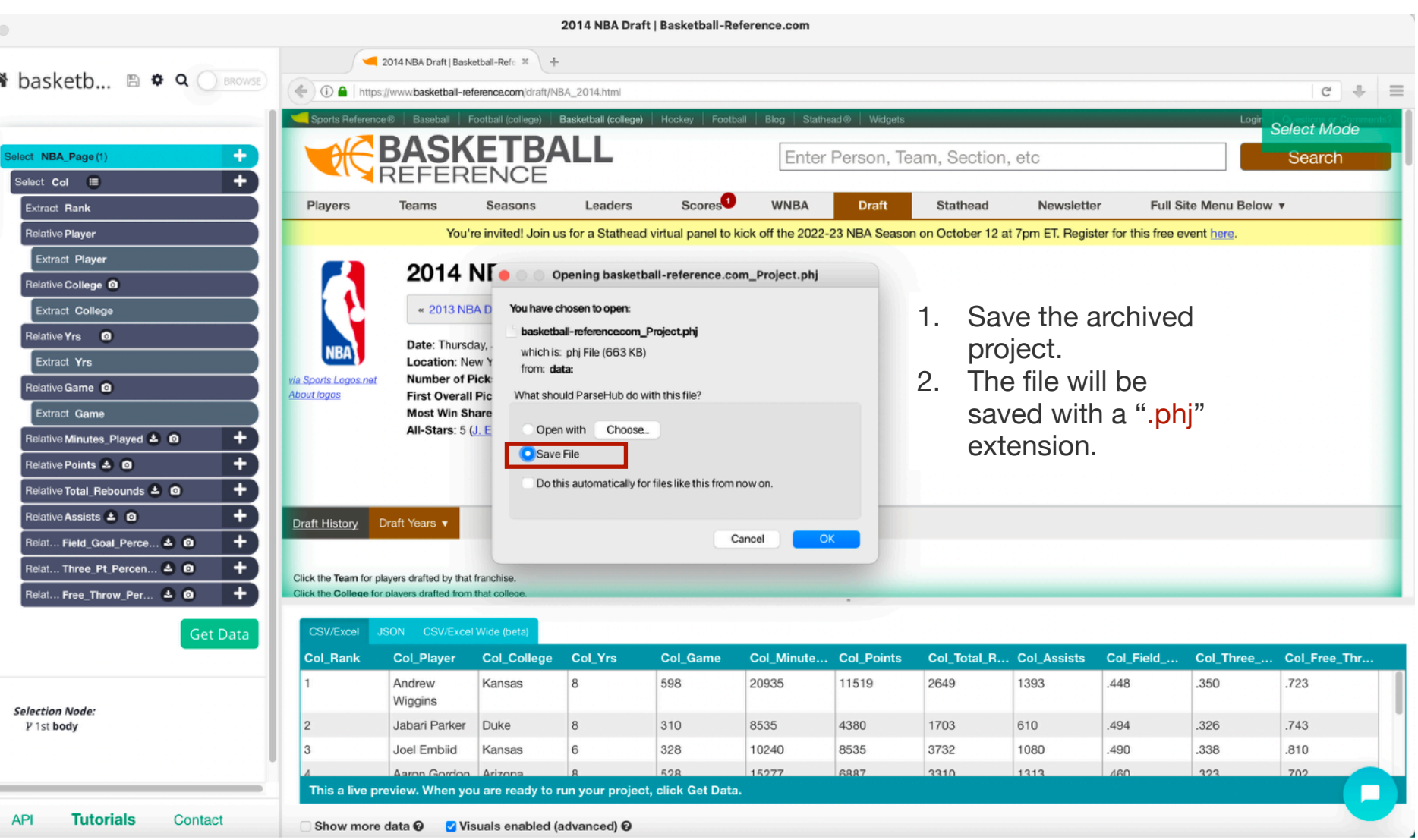
1. Pick a district in Open Rice for performing data scraping in ParseHub.
2. Export the CSV file from ParseHub and import it into OpenRefine for cleaning.
3. Import the CSV file into SQLite for SQL query analysis.
4. Connect to the SQLite database containing food data and performing analysis using Python codes combined with SQL queries to present the result in a Pandas data frame.
5. Write up your analysis and place the summary into your assignment #2 web page (Just the analysis result — not reflection).
6. Provide a link from your journal and reflect on your learning.

Export and Package Project Files for Assignment Submission

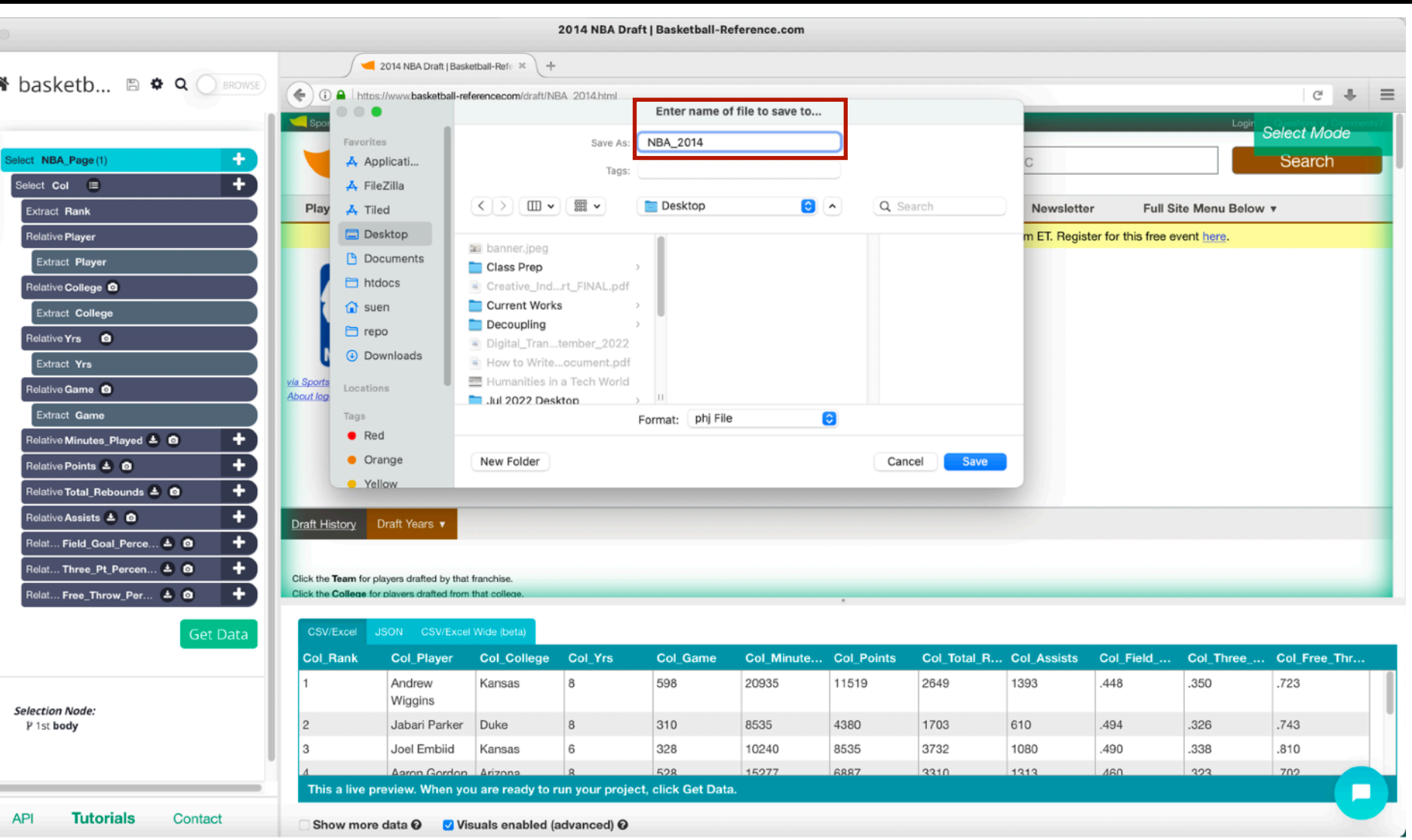
Export (archive) Scraping Project



1. After scraping is done, you can export (archive) your project with the scraping instructions included.
2. The result will be stored in a project file for later use.



1. Save the archived project.
2. The file will be saved with a ".phj" extension.


2014 NBA Draft | Basketball-Reference.com
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Decoupling
Digital_Tran...tember_2022
How to Write...ocument.pdf
Humanities in a Tech World
Jul 2022 Desktop
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ET. Register for this free event here.
Draft History
Draft Years
Click the Team for players drafted by that franchise.
Click the College for players drafted from that college.
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CSV/Excel Wide (beta)
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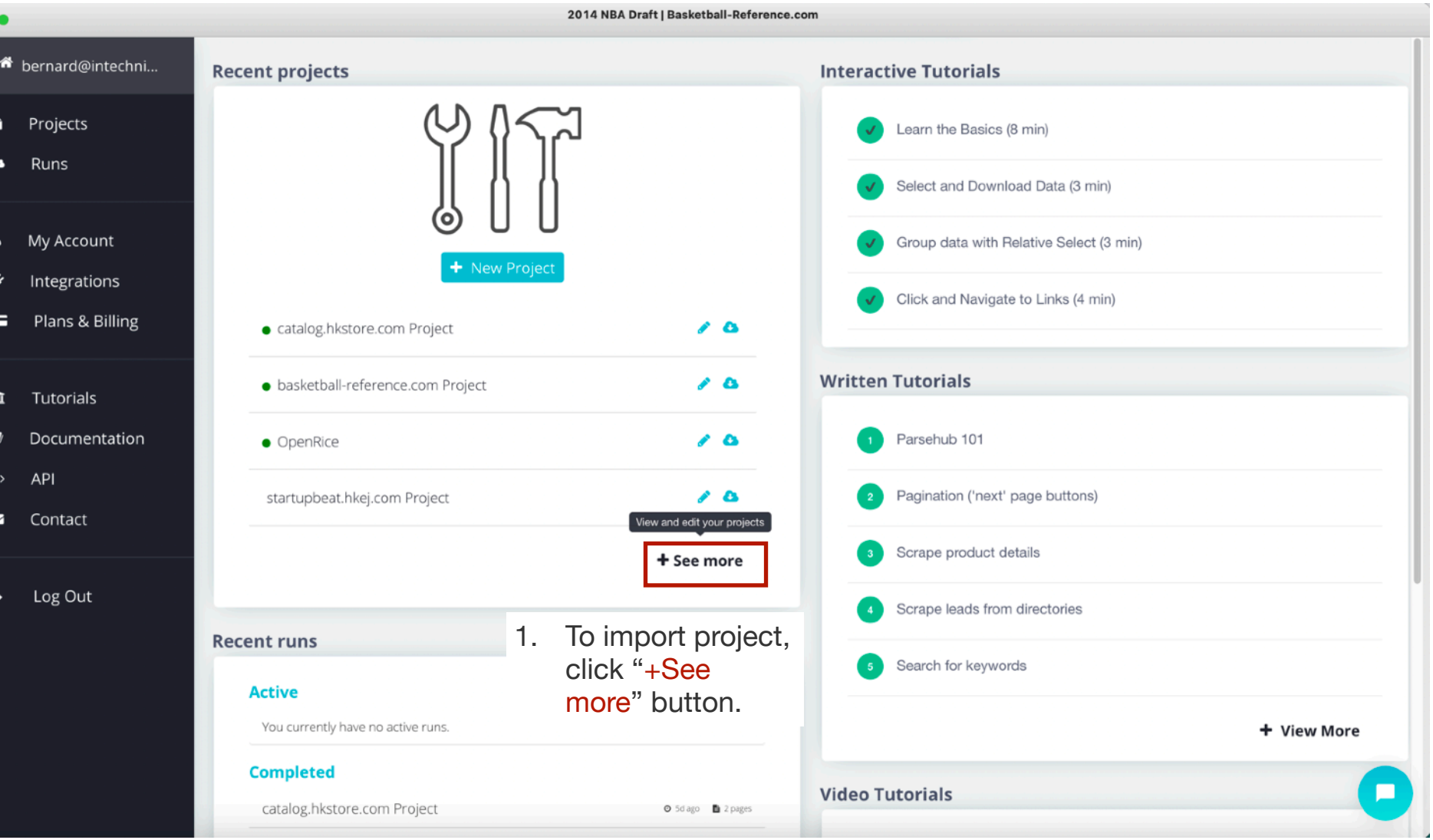
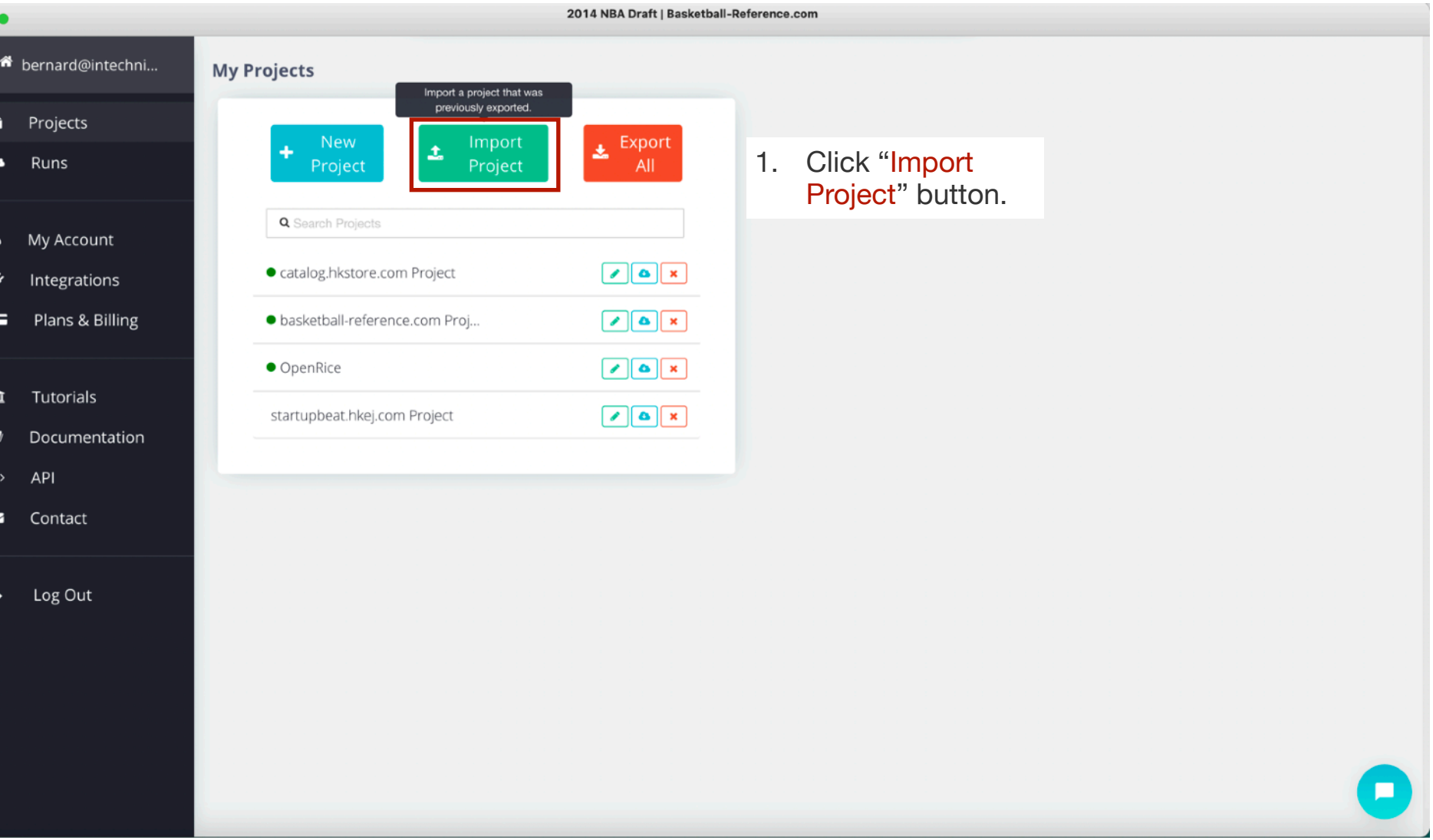
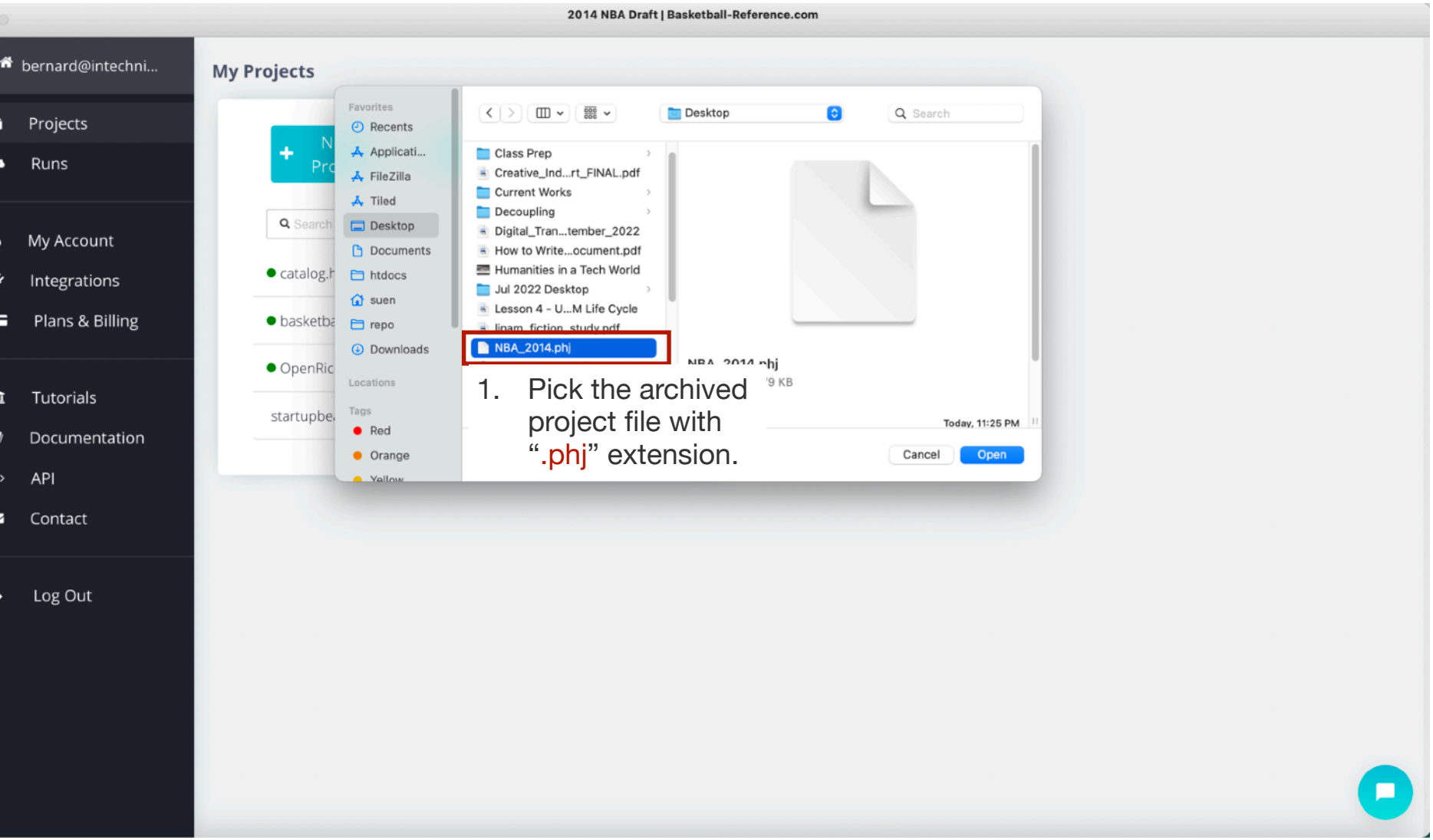
Col_Game
Col_Minute...
Col_Points
Col_Total_R...
Col_Assists
Col_Field_...
Col_Three_...
Col_Free_Thr...
1 Andrew Wiggins Kansas 8 598 20935 11519 2649 1393 .448 .350 .723
2 Jabari Parker Duke 8 310 8535 4380 1703 610 .494 .326 .743
3 Joel Embiid Kansas 6 328 10240 8535 3732 1080 .490 .338 .810
This a live preview. When you are ready to run your project, click Get Data.
Show more data
Visuals enabled (advanced)



1. To import project, click "+See more" button.



1. Click "Import Project" button.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bernard@intechni...
Projects
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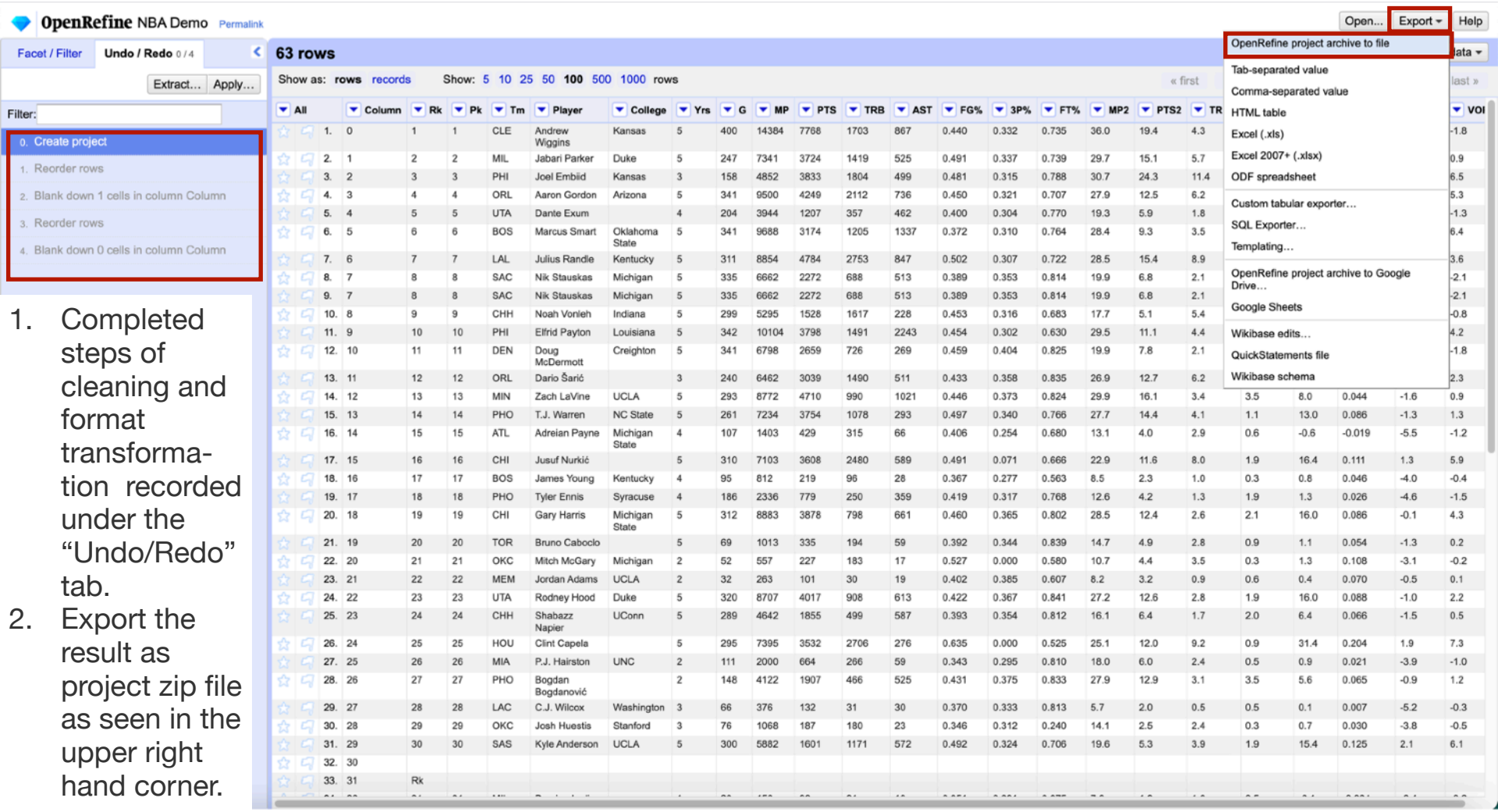
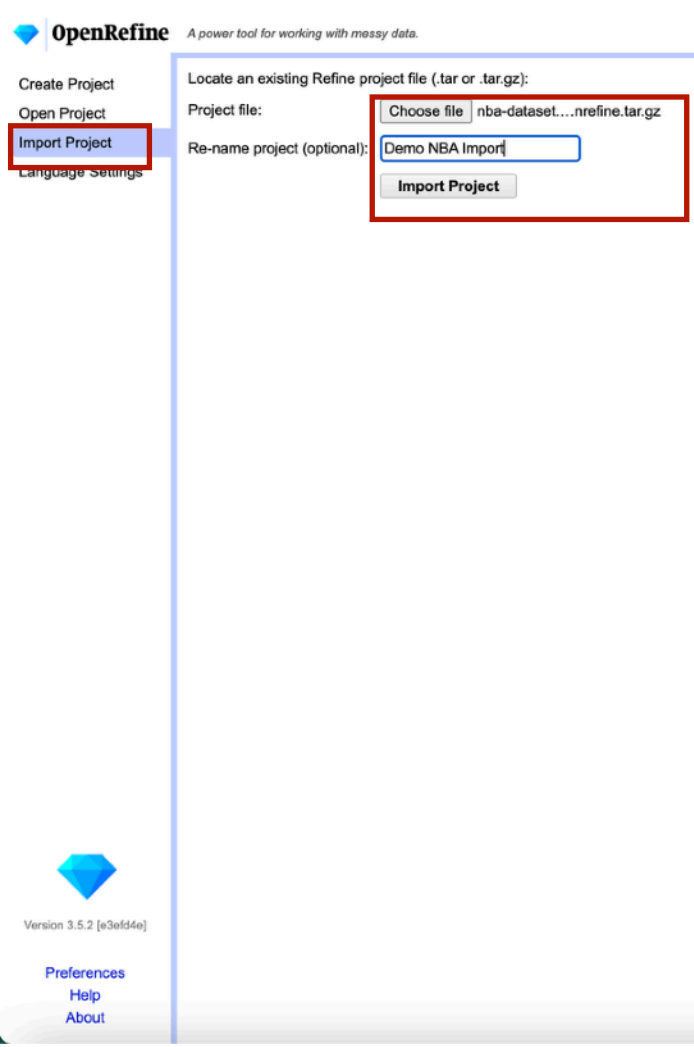
Plans & Billing
Tutorials
Documentation
API
Contact
Log Out
My Projects
Favorites
Recents
Applicati...
FileZilla
Tiled
Desktop
Documents
htdocs
suen
repo
Downloads
Locations
Tags
Red
Orange
Yellow
Desktop
Search
Class Prep
Creative_Ind...rt_FINAL.pdf
Current Works
Decoupling
Digital_Tran...tember_2022
How to Write...ocument.pdf
Humanities in a Tech World
Jul 2022 Desktop
Lesson 4 - U...M Life Cycle
NBA_2014.phj
Today, 11:25 PM
Cancel
Open
1. Pick the archived project file with ".phj" extension.

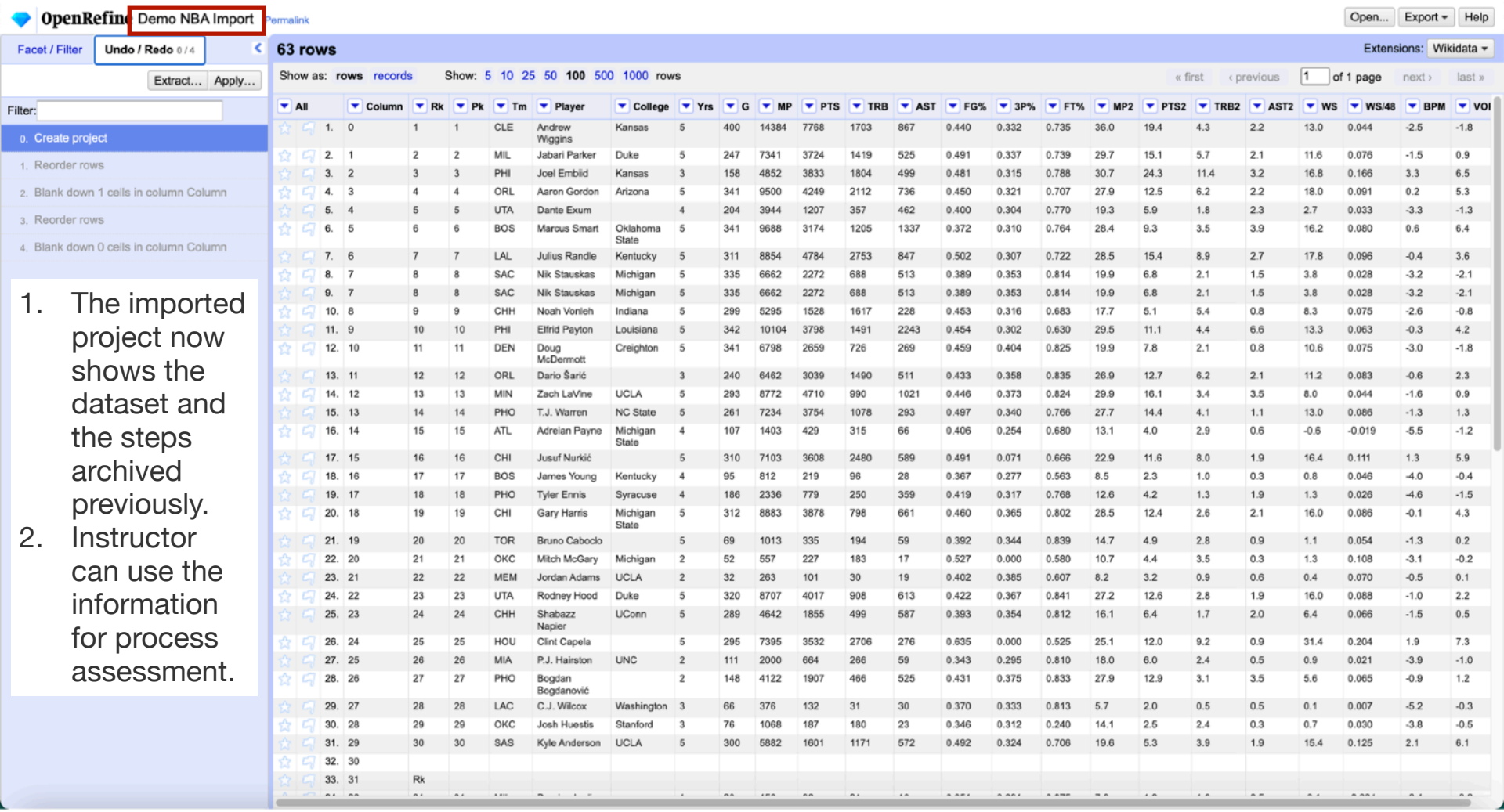
Export (archive) Cleaning Project



1. Completed steps of cleaning and format transforma-tion recorded under the “Undo/Redo” tab.
2. Export the result as project zip file as seen in the upper right hand corner.



1. Under “Import Project”, click the “Choose File” button to open the zipped project file saved previously and rename project with your own chosen name.
2. Then click “Import Project” button to import the project with both archived data and steps.



All		Column	Rk	Pk	Tm	Player	College	Yrs	G	MP	PTS	TRB	AST	FG%	3P%	FT%	MP2	PTS2	TRB2	AST2	WS	WS/48	BPM	VOI
1.	0	1	1	CLE	Andrew Wiggins	Kansas	5	400	14384	7768	1703	867	0.440	0.332	0.735	36.0	19.4	4.3	2.2	13.0	0.044	-2.5	-1.8
2.	1	2	2	MIL	Jabari Parker	Duke	5	247	7341	3724	1419	525	0.491	0.337	0.739	29.7	15.1	5.7	2.1	11.6	0.076	-1.5	0.9
3.	2	3	3	PHI	Joel Embiid	Kansas	3	158	4852	3833	1804	499	0.481	0.315	0.788	30.7	24.3	11.4	3.2	16.8	0.166	3.3	6.5
4.	3	4	4	ORL	Aaron Gordon	Arizona	5	341	9500	4249	2112	736	0.450	0.321	0.707	27.9	12.5	6.2	2.2	18.0	0.091	0.2	5.3
5.	4	5	5	UTA	Dante Exum		4	204	3944	1207	357	462	0.400	0.304	0.770	19.3	5.9	1.8	2.3	2.7	0.033	-3.3	-1.3
6.	5	6	6	BOS	Marcus Smart	Oklahoma State	5	341	9688	3174	1205	1337	0.372	0.310	0.764	28.4	9.3	3.5	3.9	16.2	0.080	0.6	6.4
7.	6	7	7	LAL	Julius Randle	Kentucky	5	311	8854	4784	2753	847	0.502	0.307	0.722	28.5	15.4	8.9	2.7	17.8	0.096	-0.4	3.6
8.	7	8	8	SAC	Nik Stauskas	Michigan	5	335	6662	2272	688	513	0.389	0.353	0.814	19.9	6.8	2.1	1.5	3.8	0.028	-3.2	-2.1
9.	7	8	8	SAC	Nik Stauskas	Michigan	5	335	6662	2272	688	513	0.389	0.353	0.814	19.9	6.8	2.1	1.5	3.8	0.028	-3.2	-2.1
10.	8	9	9	CHH	Noah Vonleh	Indiana	5	299	5295	1528	1617	228	0.453	0.316	0.683	17.7	5.1	5.4	0.8	8.3	0.075	-2.6	-0.8
11.	9	10	10	PHI	Elfrid Payton	Louisiana	5	342	10104	3798	1491	2243	0.454	0.302	0.630	29.5	11.1	4.4	6.6	13.3	0.063	-0.3	4.2
12.	10	11	11	DEN	Doug McDermott	Creighton	5	341	6798	2659	726	269	0.459	0.404	0.825	19.9	7.8	2.1	0.8	10.6	0.075	-3.0	-1.8
13.	11	12	12	ORL	Dario Šarić		3	240	6462	3039	1490	511	0.433	0.358	0.835	26.9	12.7	6.2	2.1	11.2	0.083	-0.6	2.3
14.	12	13	13	MIN	Zach LaVine	UCLA	5	293	8772	4710	990	1021	0.446	0.373	0.824	29.9	16.1	3.4	3.5	8.0	0.044	-1.6	0.9
15.	13	14	14	PHO	T.J. Warren	NC State	5	261	7234	3754	1078	293	0.497	0.340	0.766	27.7	14.4	4.1	1.1	13.0	0.086	-1.3	1.3
16.	14	15	15	ATL	Adreian Payne	Michigan State	4	107	1403	429	315	66	0.406	0.254	0.680	13.1	4.0	2.9	0.6	-0.6	-0.019	-5.5	-1.2
17.	15	16	16	CHI	Jusuf Nurkić		5	310	7103	3608	2480	589	0.491	0.071	0.666	22.9	11.6	8.0	1.9	16.4	0.111	1.3	5.9
18.	16	17	17	BOS	James Young	Kentucky	4	95	812	219	96	28	0.367	0.277	0.563	8.5	2.3	1.0	0.3	0.8	0.046	-4.0	-0.4
19.	17	18	18	PHO	Tyler Ennis	Syracuse	4	186	2336	779	250	359	0.419	0.317	0.768	12.6	4.2	1.3	1.9	1.3	0.026	-4.6	-1.5
20.	18	19	19	CHI	Gary Harris	Michigan State	5	312	8883	3878	798	661	0.460	0.365	0.802	28.5	12.4	2.6	2.1	16.0	0.086	-0.1	4.3
21.	19	20	20	TOR	Bruno Caboclo		5	69	1013	335	194	59	0.392	0.344	0.839	14.7	4.9	2.8	0.9	1.1	0.054	-1.3	0.2
22.	20	21	21	OKC	Mitch McGary	Michigan	2	52	557	227	183	17	0.527	0.000	0.580	10.7	4.4	3.5	0.3	1.3	0.108	-3.1	-0.2
23.	21	22	22	MEM	Jordan Adams	UCLA	2	32	263	101	30	19	0.402	0.385	0.607	8.2	3.2	0.9	0.6	0.4	0.070	-0.5	0.1
24.	22	23	23	UTA	Rodney Hood	Duke	5	320	8707	4017	908	613	0.422	0.367	0.841	27.2	12.6	2.8	1.9	16.0	0.088	-1.0	2.2
25.	23	24	24	CHH	Shabazz Napier	UConn	5	289	4642	1855	499	587	0.393	0.354	0.812	16.1	6.4	1.7	2.0	6.4	0.066	-1.5	0.5
26.	24	25	25	HOU	Clint Capela		5	295	7395	3532	2706	276	0.635	0.000	0.525	25.1	12.0	9.2	0.9	31.4	0.204	1.9	7.3
27.	25	26	26	MIA	P.J. Hairston	UNC	2	111	2000	664	266	59	0.343	0.295	0.810	18.0	6.0	2.4	0.5	0.9	0.021	-3.9	-1.0
28.	26	27	27	PHO	Bogdan Bogdanović		2	148	4122	1907	466	525	0.431	0.375	0.833	27.9	12.9	3.1	3.5	5.6	0.065	-0.9	1.2
29.	27	28	28	LAC	C.J. Wilcox	Washington	3	66	376	132	31	30	0.370	0.333	0.813	5.7	2.0	0.5	0.5	0.1	0.007	-5.2	-0.3
30.	28	29	29	OKC	Josh Huestis	Stanford	3	76	1068	187	180	23	0.346	0.312	0.240	14.1	2.5	2.4	0.3	0.7	0.030	-3.8	-0.5
31.	29	30	30	SAS	Kyle Anderson	UCLA	5	300	5882	1601	1171	572	0.492	0.324	0.706	19.6	5.3	3.9	1.9	15.4	0.125	2.1	6.1
32.	30																						
33.	31	Rk																					

1. The imported project now shows the dataset and the steps archived previously.
2. Instructor can use the information for process assessment.

Package (zipping) the Project Files for Assignment Submission

jupyter assignment2 Last Checkpoint: 8 minutes ago (unsaved changes)

Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

Assignment 2: Top 10 from NBA Draft 2014 Dataset

via Sports Logos.net
About logos

2014 NBA Draft

« 2013 NBA Draft 2015 NBA Draft »

Date: Thursday, June 26, 2014
Location: New York, New York
Number of Picks: 60 (53 played in NBA)
First Overall Pick: Andrew Wiggins (24.0 Win Shares)
Most Win Shares: N. Jokić (79.6), C. Capela (52.9) and J. Embiid (43.7)
All-Stars: 5 (J. Embiid, N. Jokić, Z. LaVine, J. Randle and A. Wiggins)

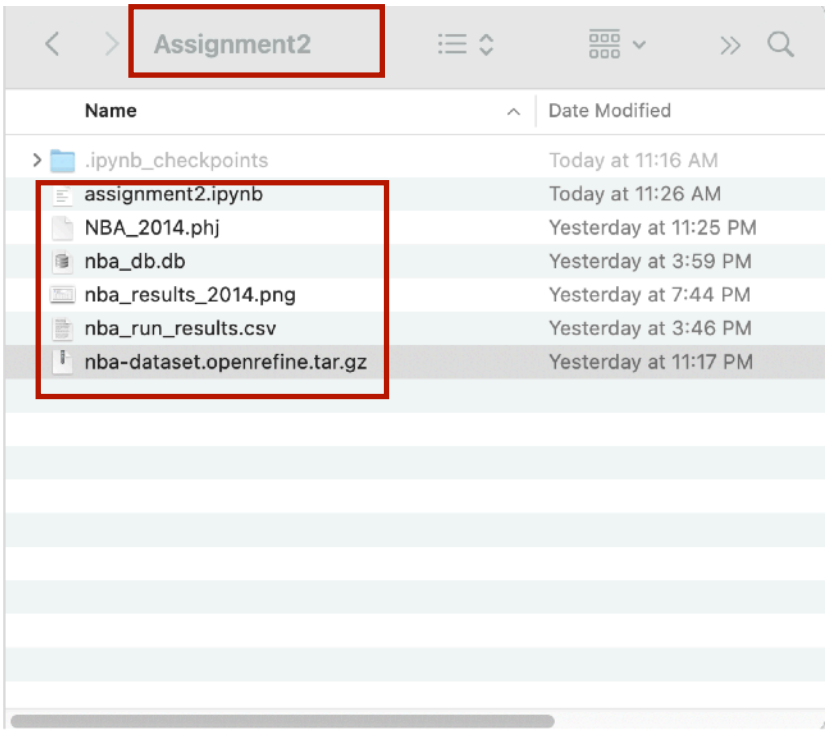
	Col_Player	Col_College	Col_Game	Col_Yrs	Games/Years	Points	Avg Poits/Yr
0	Zach LaVine	UCLA	478	8	59.75	9466	158.43
1	Joel Embiid	Kansas	328	6	54.67	8535	156.13
2	Andrew Wiggins	Kansas	598	8	74.75	11519	154.10
3	Julius Randle	Kentucky	518	8	64.75	9191	141.95
4	Jordan Clarkson	Missouri	600	8	75.00	9216	122.88
5	Jabari Parker	Duke	310	6	38.75	4380	113.03
6	T.J. Warren	NC State	332	7	47.43	5142	108.42
7	Aaron Gordon	Arizona	528	8	66.00	6887	104.35
8	Spencer Dinwiddie	Colorado	387	8	48.38	5042	104.23
9	Gary Harris	Michigan State	468	8	58.50	5526	94.46
10	Jerami Grant	Syracuse	555	8	69.38	6329	91.23

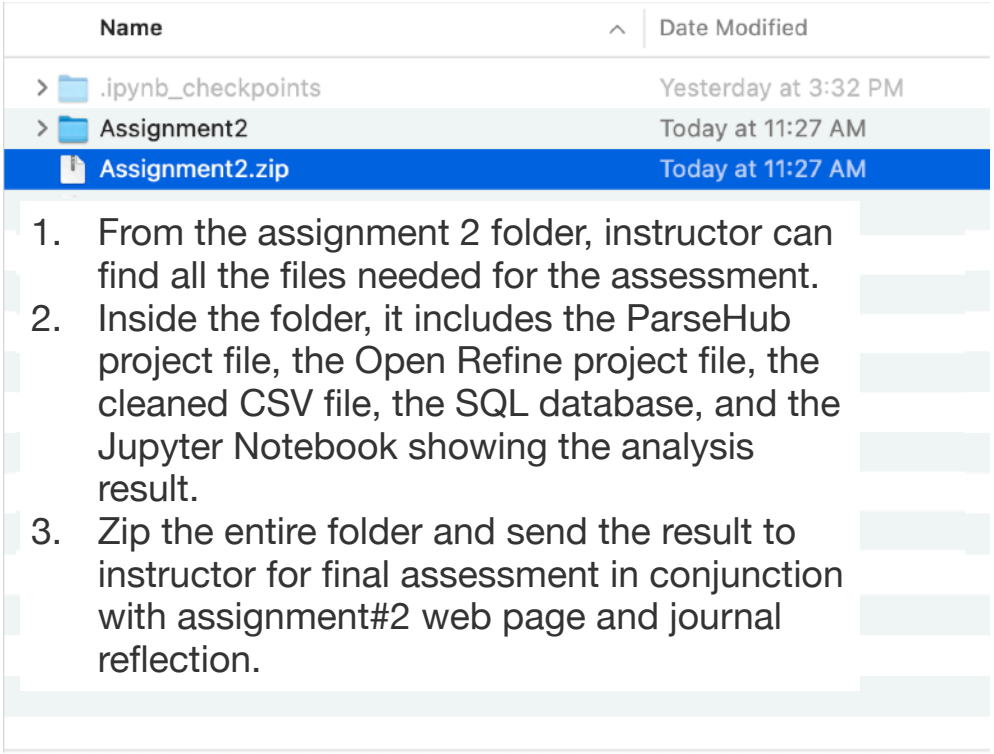
	Col_College	Total Avg Poits/Yr
0	Kansas	310.23
1	UCLA	218.06
2	Duke	196.17
3	Kentucky	151.17
4	Missouri	122.88
5	Michigan State	110.50
6	NC State	108.42
7	Syracuse	107.98
8	Arizona	106.99
9	Colorado	104.23
10	Oklahoma State	99.16

SQL commands for performing data analysis of the dataset.

In [1]:

```
import pandas as pd
import sqlite3
con = sqlite3.connect('nba_db.db')
sql = "SELECT * FROM nba_run_results"
df = pd.read_sql_query(sql,con)
con.close()
df
```





1. From the assignment 2 folder, instructor can find all the files needed for the assessment.
2. Inside the folder, it includes the ParseHub project file, the Open Refine project file, the cleaned CSV file, the SQL database, and the Jupyter Notebook showing the analysis result.
3. Zip the entire folder and send the result to instructor for final assessment in conjunction with assignment#2 web page and journal reflection.

Scraping and Cleaning Using Code (Demonstration in Jupyter Notebook)

Python Package for Data Scraping and Cleaning

Basic usage of the BeautifulSoup Scraping Package

```
1  from bs4 import BeautifulSoup
2  src = open("list.html")
3  document = BeautifulSoup(src, 'lxml')
4  print(document)
5  #ulist = document.find("ul")
6  #print(ulist)
7  #items = ulist.find_all("li")
8  #print(items)
9  #for item in items:
10 #    print(item.get_text())
```

```
<!DOCTYPE html>
<html>
<body>
<h2>An Unordered HTML List</h2>
<ul id="unordered_list" style="color:#069">
<li>Coffee</li>
<li>Tea</li>
<li>Milk</li>
</ul>
<h2>An Ordered HTML List</h2>
<ol id="ordered_list" style="color:#069">
<li>Coffee</li>
<li>Tea</li>
<li>Milk</li>
</ol>
</body>
</html>
```

Scrap multipe Pages from website

eshop.cataloghk.com(https://catalog.hkstore.com/catalog_tc_hk/men) with UTF-8 CSV file storage

```
:
```

```python
import requests
import csv
import pandas as pd
from bs4 import BeautifulSoup

header = ['page #','brand','url','product','price']
data = []
# Display and store away 2 pages of scrapped data from startupbeat.hkej.com
for i in range(1,4):
    quote_page = requests.get('https://catalog.hkstore.com/catalog_tc_hk/men?p='+str(i))
    print("\n***** Page " + str(i) +" in action *****")
    soup = BeautifulSoup(quote_page.content,'html.parser')
    # for item in soup.find_all("li", attrs={"class":"item product product-item"}):
    for item in soup.find_all("li", attrs={"class":"item product product-item"}):
        page_no = str(i)
        brand = item.find("div",attrs={"class":"product-item-brand"}).span.get_text()
        url = item.find("strong",attrs={"class":"product name product-item-name"}).a.get('href')
        product = item.find("a",attrs={"class":"product-item-link"}).get_text().strip()
        price = item.find("span",attrs={"class":"price"}).get_text().strip()
        data.append((page_no, brand, url, product, price))
        # print(data)

df = pd.DataFrame(data,
   columns = header
)
df.to_csv('eshop_catalog.csv', sep='\t', encoding='utf-8')
df
```

Scraping and Reading NBA Draft 2014 Dataset into Data Frame

```
import requests
from bs4 import BeautifulSoup
import pandas as pd
import csv

url = "http://www.basketball-reference.com/draft/NBA_2014.html"
html = requests.get(url)
soup = BeautifulSoup(html.content,'html.parser')
column_headers = []
for th in soup.findAll('tr',limit=2)[1].findAll('th'):
    column_headers.append(th.getText())
data_rows = soup.findAll('tr')[2:]  # skip the first 2 header rows
player_data = []
for i in range(len(data_rows)):  # for each table row
    player_row = []
    # for each table data element from each table row
    for th in data_rows[i].findAll('th',limit=1):
        player_row.append(th.getText())
    for td in data_rows[i].findAll('td'):
        # get the text content and append to the player_row
        player_row.append(td.getText())
    # then append each pick/player to the player_data matrix
    player_data.append(player_row)
df = pd.DataFrame(player_data, columns=column_headers)
df.to_csv('nba.csv')
# print(df.shape)
# pd.set_option('display.max_rows', 62)
df.head(20)
```

Advantages of Using Codes

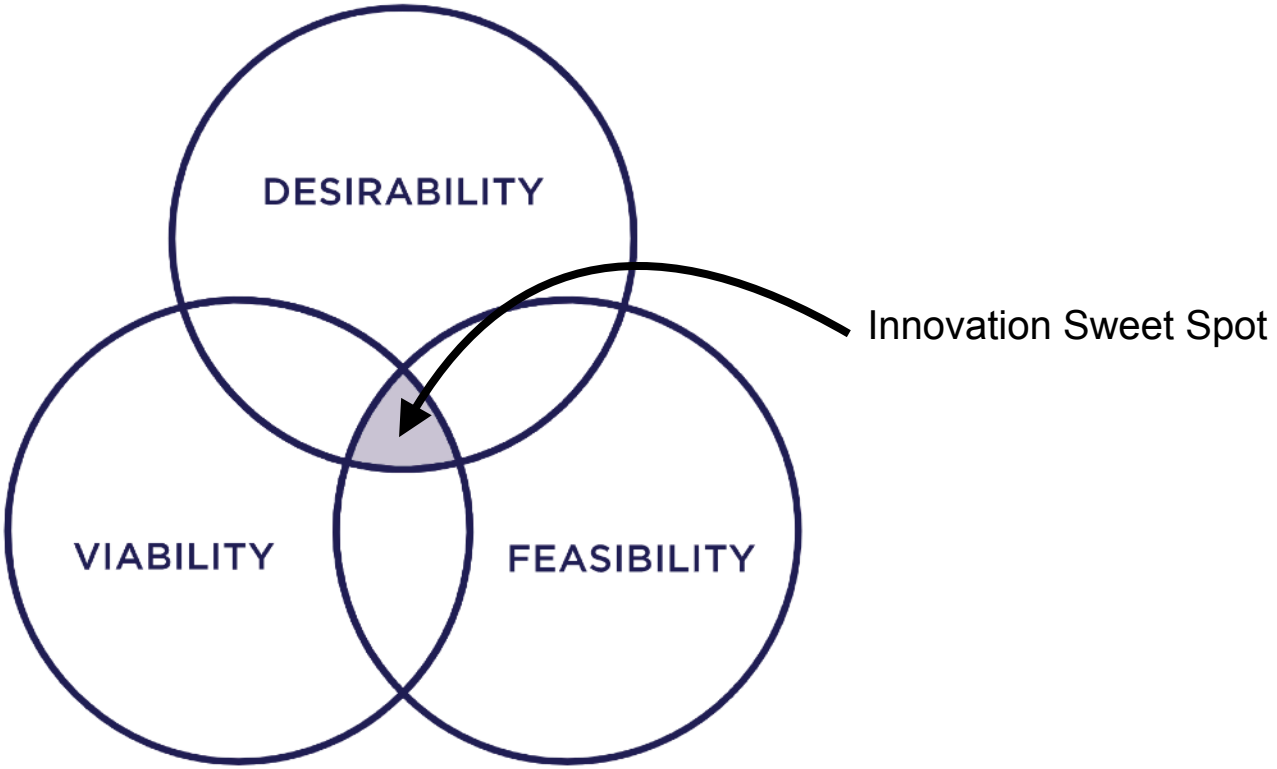
1. Speed and performance
2. Integration and automation
3. More control and less limitations (except one's technical capabilities)

Today’s agenda.

1. What is Design Thinking? And how does it work?
2. The 5 Planes of User Experience (UX) Framework
3. From UX Journey Mapping to User Story Mapping
4. The Cross Industry Standard Process for Data Mining (CRISP-DM)
5. From User Story Mapping to Information Architecture Design
6. Database Design and Information Architecture

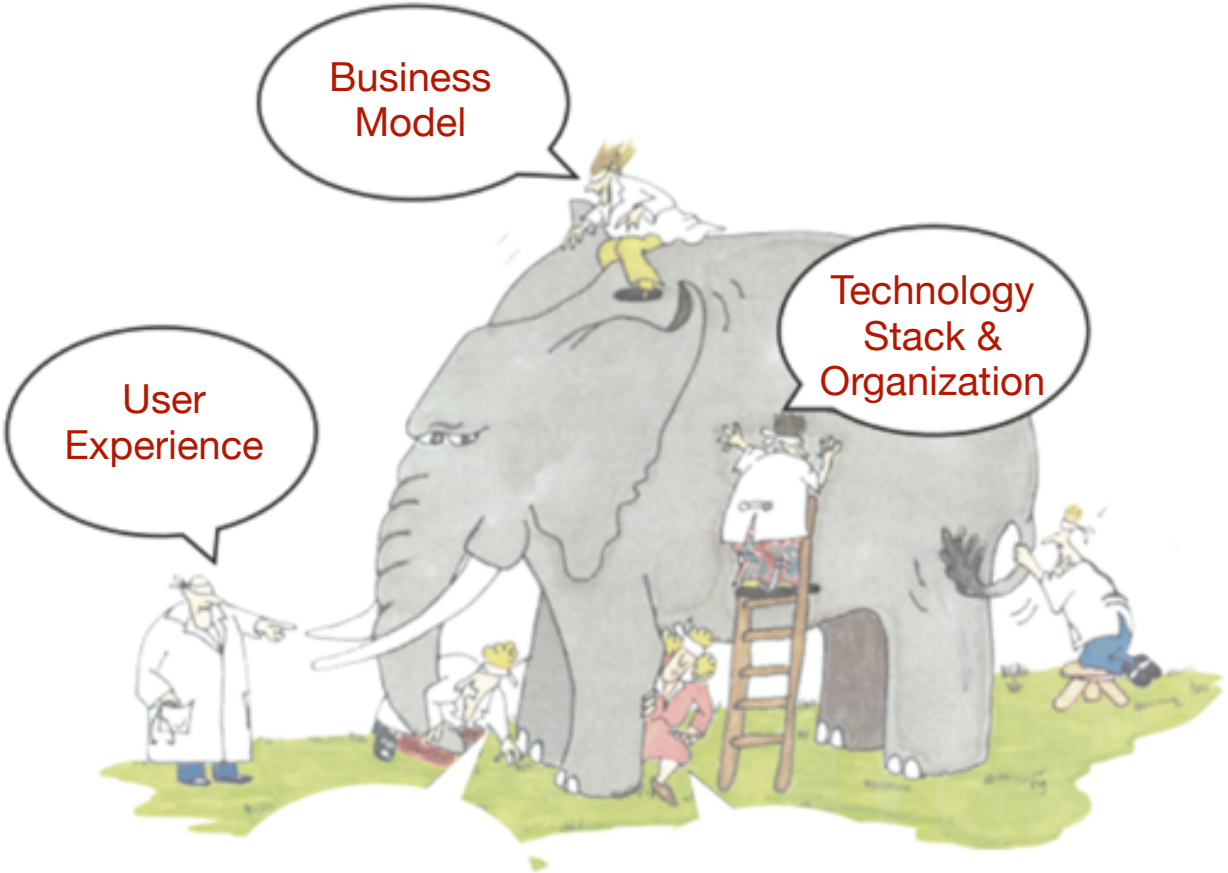
Design thinking is a **human-centric** problem discovery and problem solving **process** that:

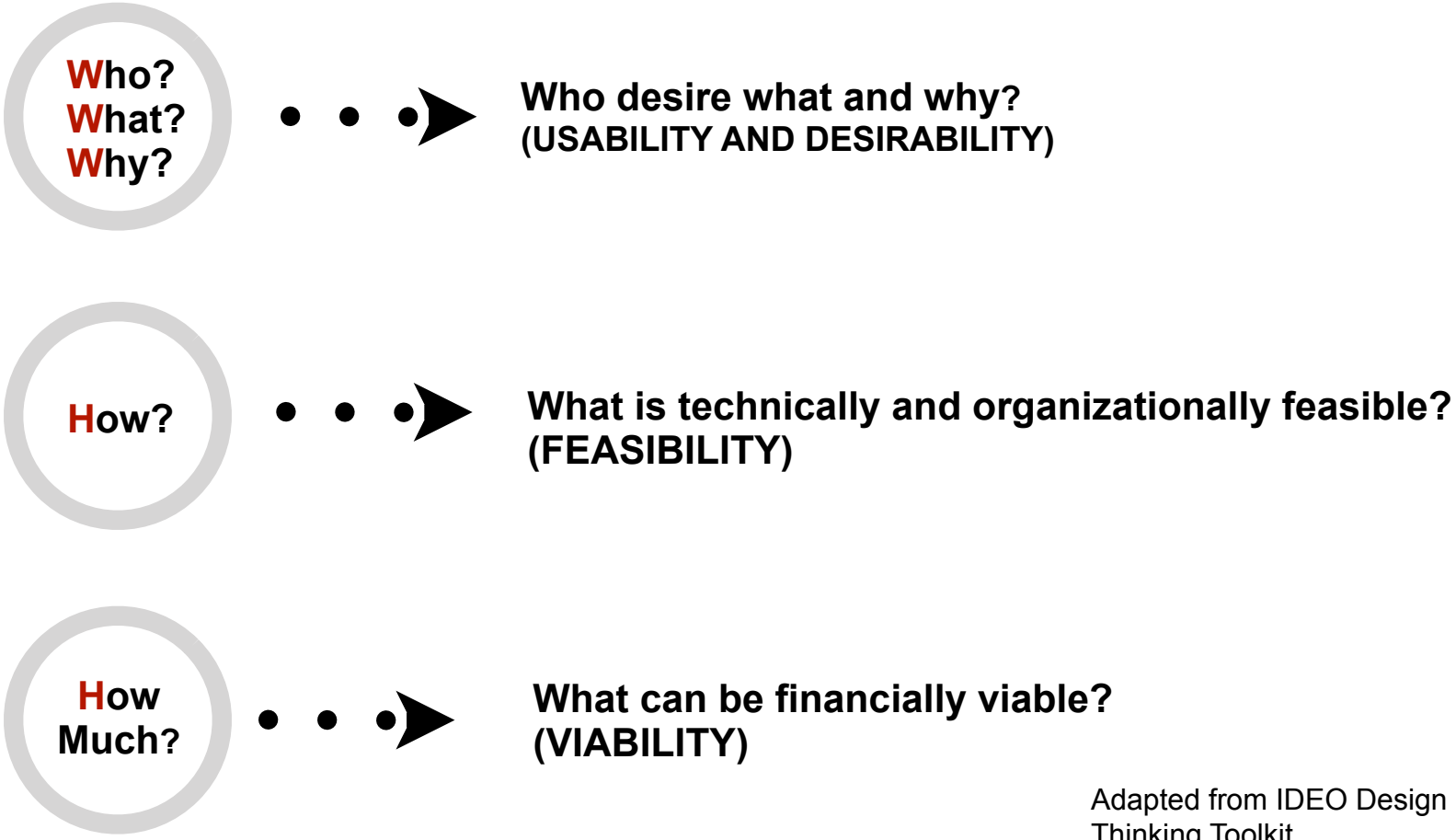
(a) Understand and focus on people
(b) Address the right problem, not the symptoms
(c) Look at the entire system, not individual components
(d) Iterate and improve


DESIRABILITY
VIABILITY
FEASIBILITY
Innovation Sweet Spot

Source: IDEO

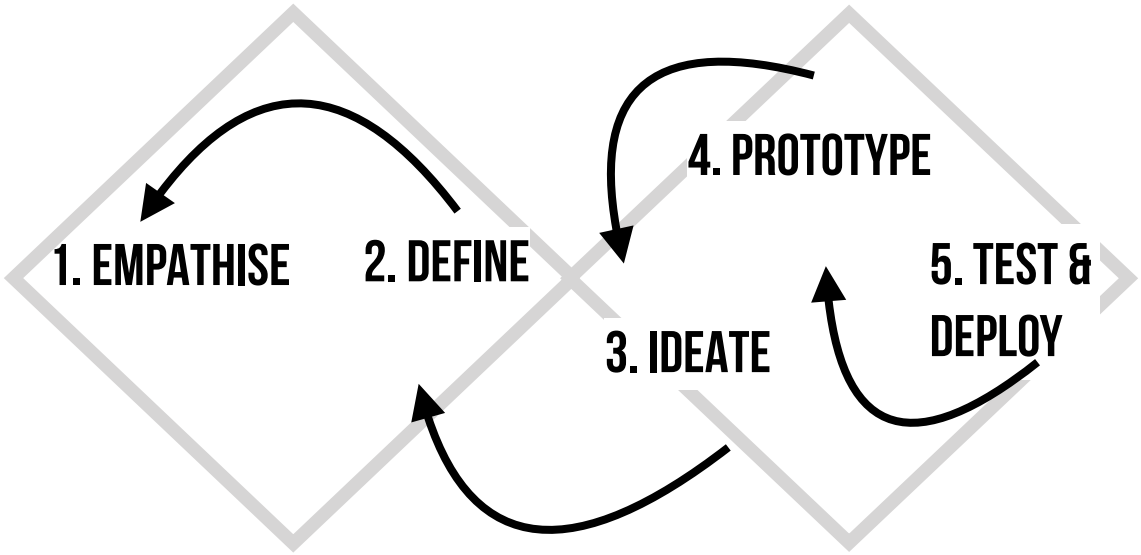

Can we make a profit out of it?
Can we build it ?
Will people love and buy it ?


Business Model
Technology Stack & Organization
User Experience



Adapted from IDEO Design Thinking Toolkit

The Design Thinking Process (Double Diamond Model)




CASE STUDY : REDESIGNING THE
SHOPPING CART

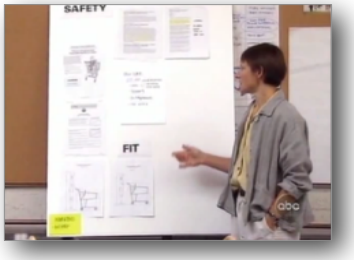
1. EMPATHISE

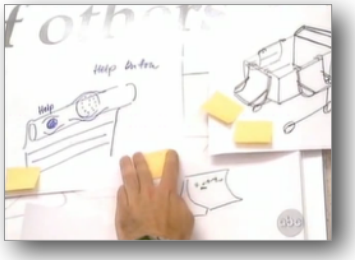
2. DEFINE

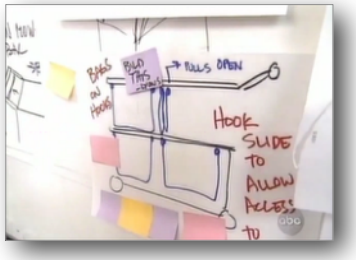
3. IDEATE

4. PROTOTYPE

5. TEST & DEPLOY



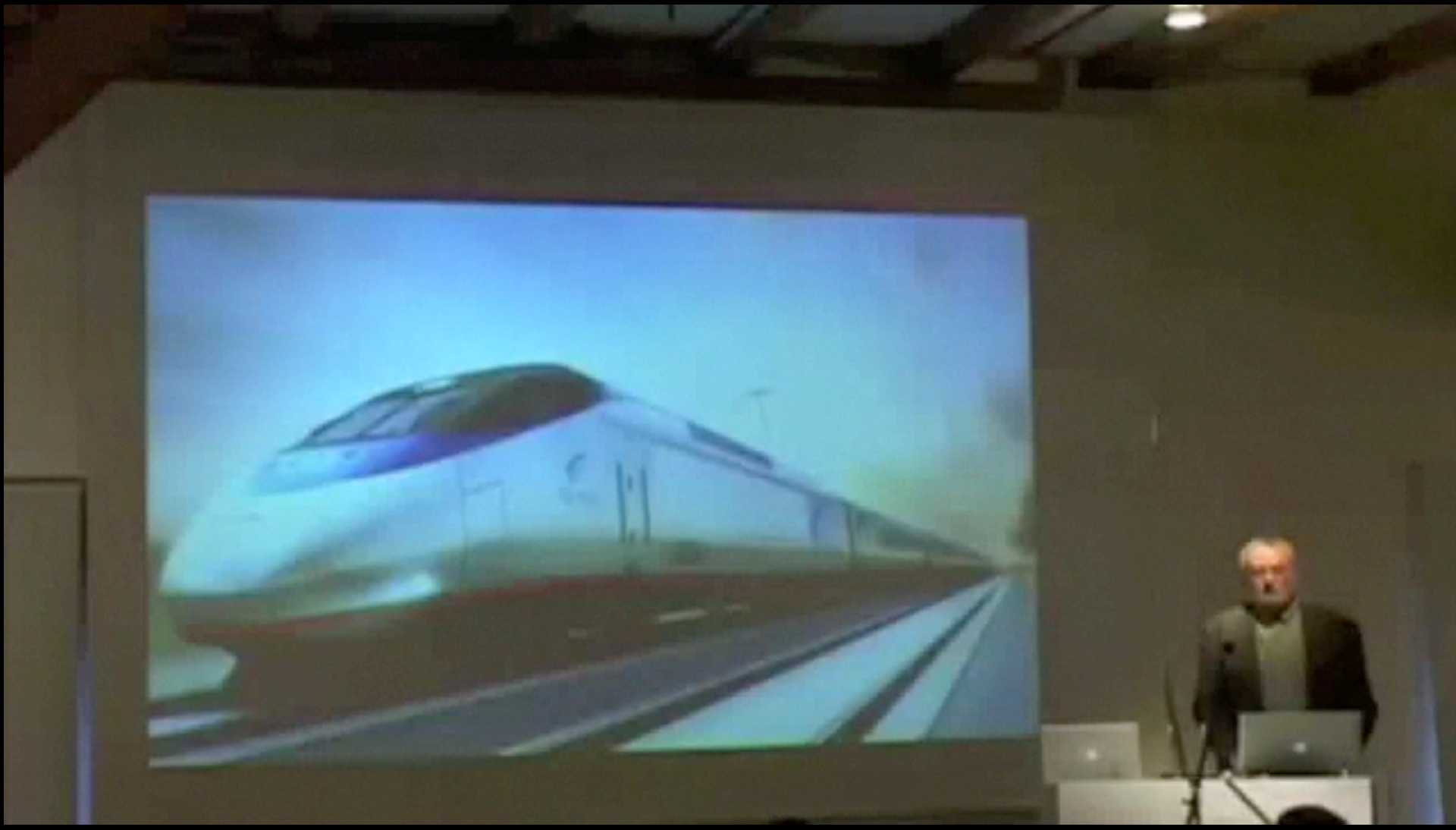


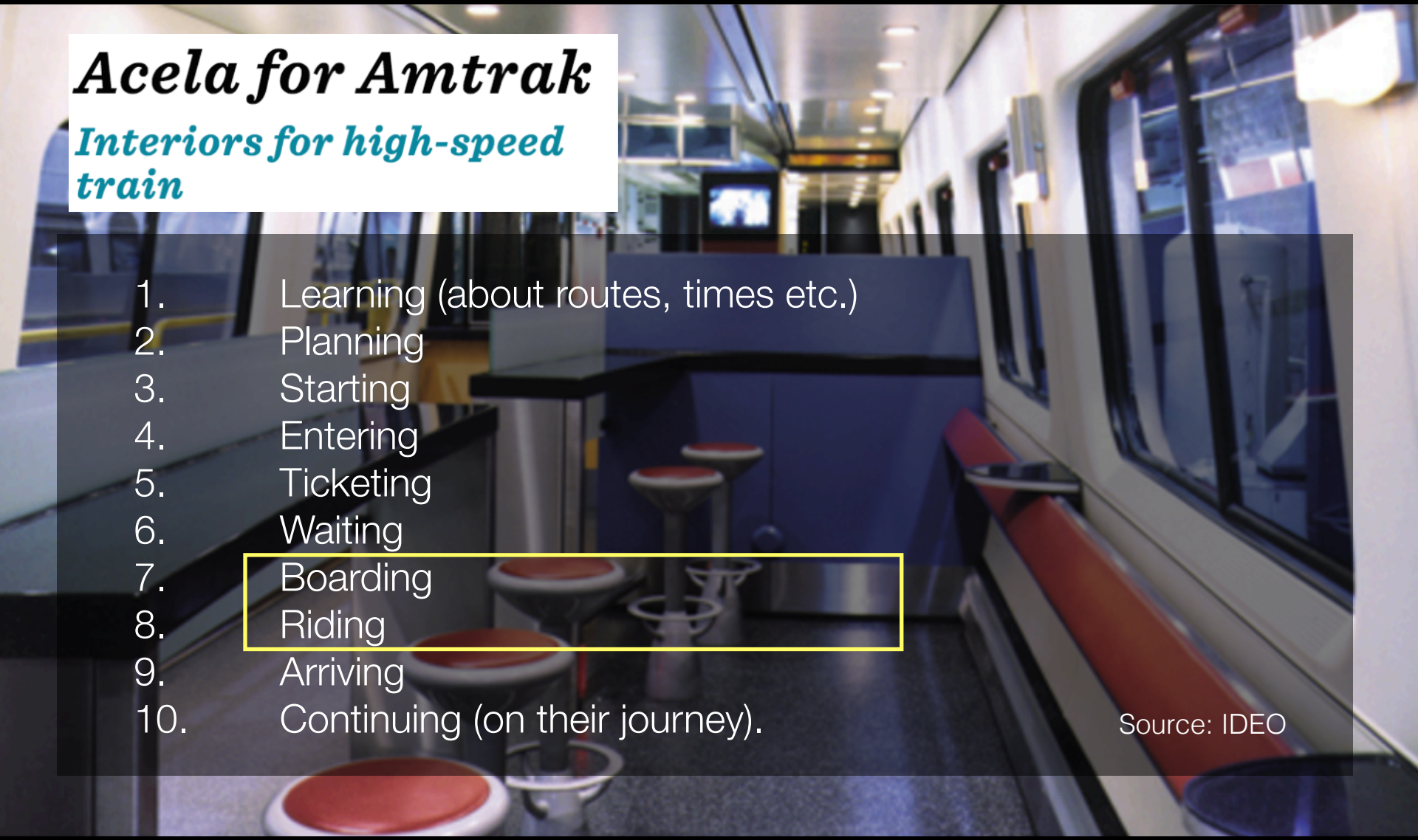


Empathy of the user experience as the starting point.

CASE STUDY: REDESIGNING THE TRAIN INTERIOR

Source: IDEO





Acela for Amtrak

Interiors for high-speed train

1. Learning (about routes, times etc.)
2. Planning
3. Starting
4. Entering
5. Ticketing
6. Waiting
7. Boarding
8. Riding
9. Arriving
10. Continuing (on their journey).

Source: IDEO

Acela for Amtrak

Interiors for high-speed train

1. Learning (about routes, times etc.)
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4. Entering
5. Ticketing
6. Waiting
7. Boarding
8. Riding
9. Arriving
10. Continuing (on their journey).

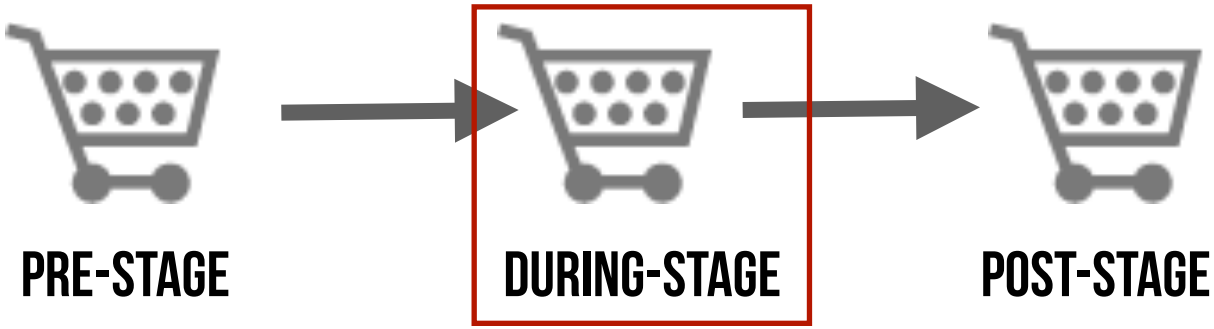
Source: IDEO

EXPERIENCE OF USING

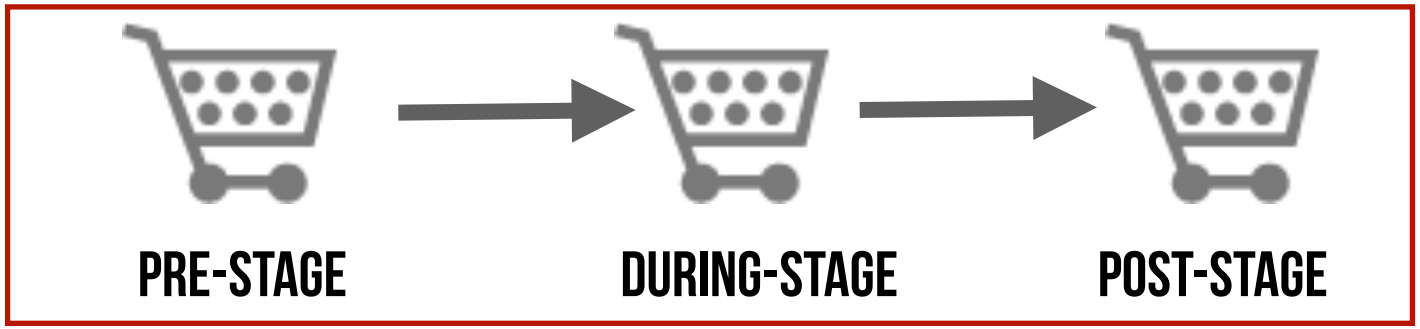
DESIGN "X"

UX = JOURNEY

”The experience is the journey.”



”The experience is the journey.”



UX AS A JOURNEY

Elements

1. Persona
2. Context
3. Artifacts
4. Tasks/Jobs

Structure

1. Problem
2. Alternatives
3. Transformation
4. Synthesis

} Current Journey

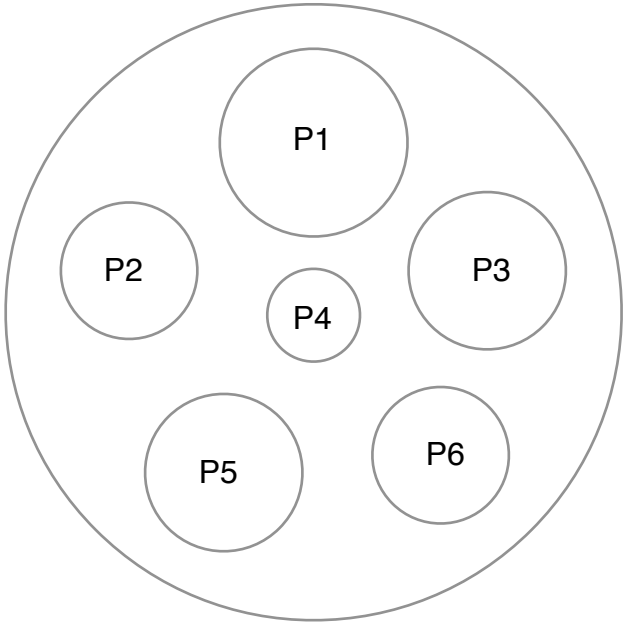
} Future Journey

Mapping the customer journey with a POV.

Whose point of view ?

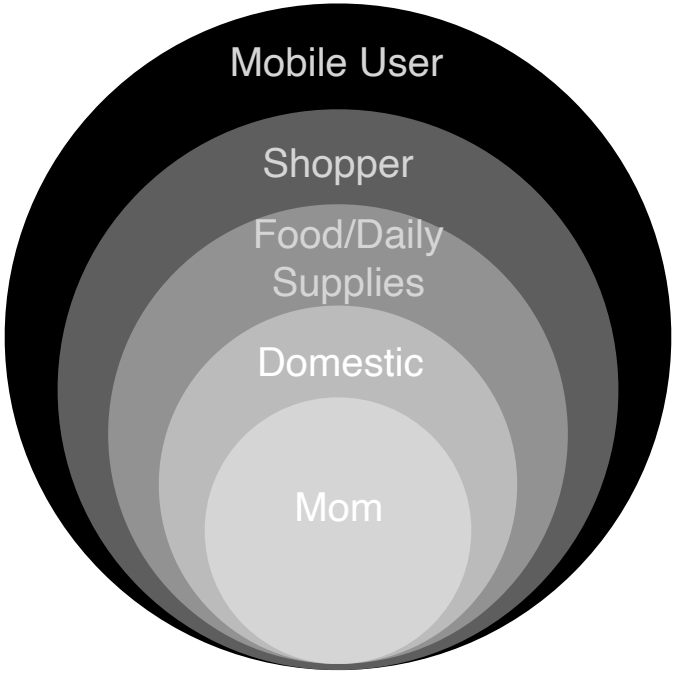
1. **Users/Customers** (which type of user/ customer?)
2. **Staff** (in-store, outside-store)
3. **Owner** (supermarket top management)
4. **Others** (suppliers, community, government)

E.g. Life experience and needs of different persona during COVID… where are the opportunities?



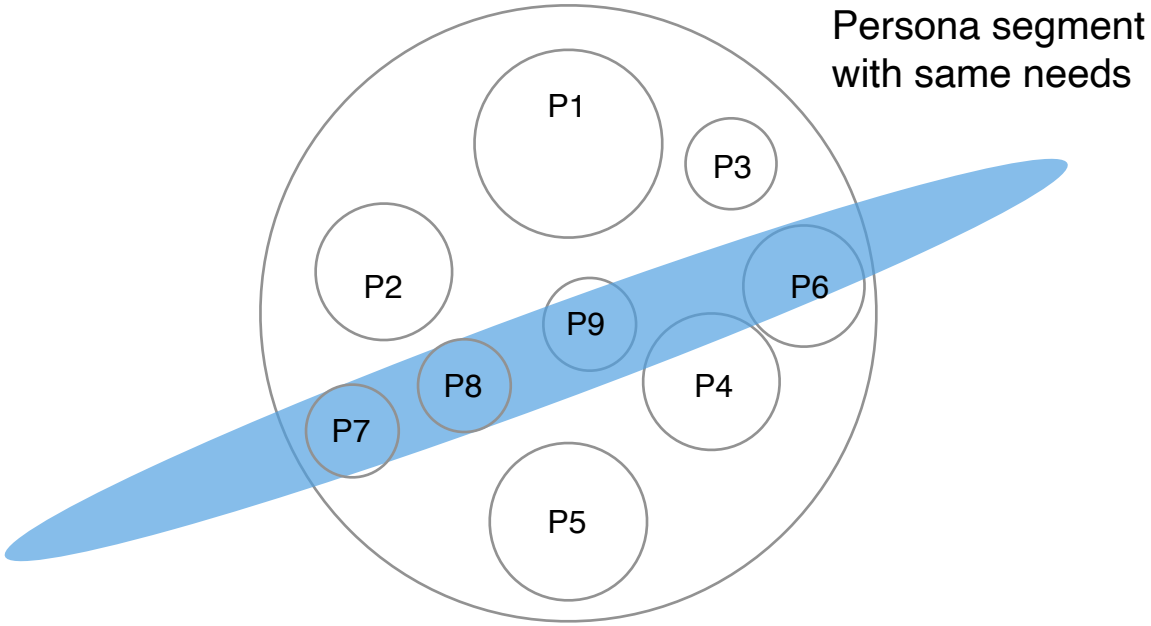
P1 To P6 (Persona Types)
e.g. House wife, professional, domestic helpers, students, health-care practitioners, retailers, logistic operators, etc.

Persona Segmentation



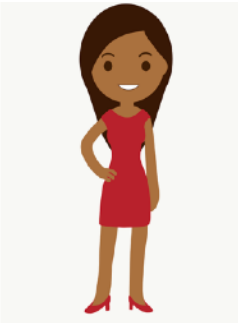
Persona segment
with same needs

Shopper with time saving needs
- Long work hrs office worker
- Mom with kids
- Domestic helper



Persona

Source:Interaction Design Foundation



Name: **Ivy**
Age: **36**
Sex: **Female**
Education: **Secondary**
Marital Status: **Married with one kid**
Industry: **House wife**

Lifestyle: **Love to cook, home decoration, activity planning for kids and family.**

Shopping preference: **Shop off-line using cash and credit card.**

Media usage preference: **Soap opera fan, online videos, local news.**

Life/Career goal: **Help kid get into good school. Keep family happy.**

Tech product adoption pref.: **Not an early adopter of trendy tech products.**

Daily routine: **Taking kid to school, shopping for food an family necessities, cook meals and help kid do homework**

Source: Flickr (mliu92)

Google Cloud

Admin console

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Journey Map

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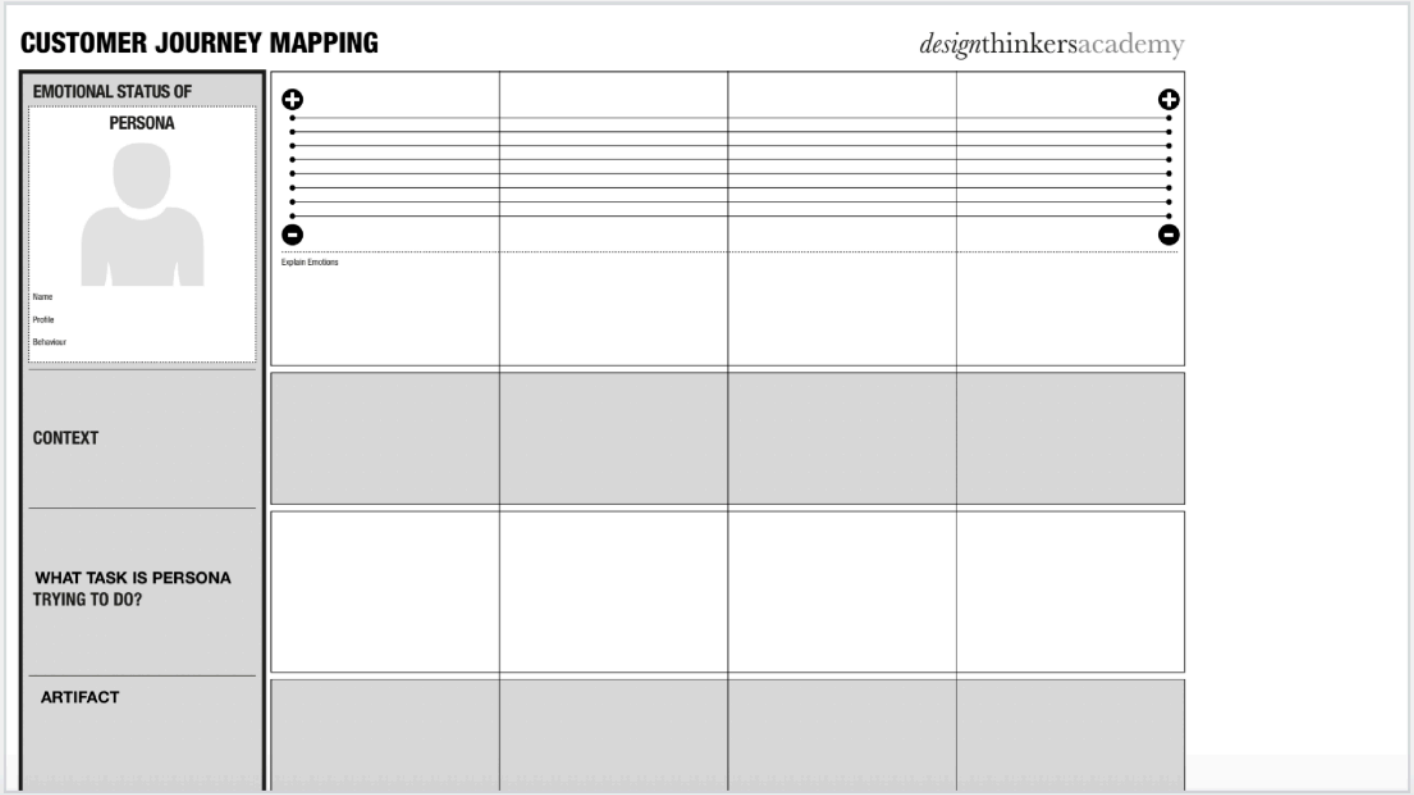

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CUSTOMER JOURNEY MAPPING

designthinkersacademy

EMOTIONAL STATUS OF PERSONA

Name
Profile
Behaviour

Ivy - a full time house wife | Love cooking, decorating home | Take care of children's study and housework | Organize activities for children | Stressful during the child's exam | Offline shopping with cash or credit card | Watch news and soap opera online | Conservative in accepting new things.

CONTEXT

At home | Inside the car | Parking lot | Inside super market | Inside the car | At home

WHAT TASK IS PERSONA TRYING TO DO?

Prepare Checklist | Check kitchen cabinet | Check refrigerator | Bring kid along | Park car and pick up cart | Start shopping | Checkout | Return home

ARTIFACT

kitchen and laundry cabinets | bathroom supplies and refrigerator | smartphone and app | car seat for kid | shopping cart station | Signages | Checkout register | shopping cart station

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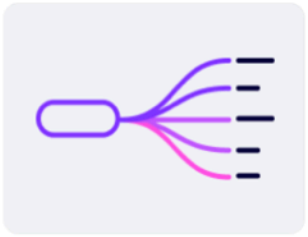

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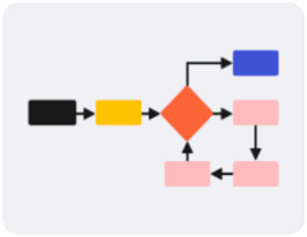
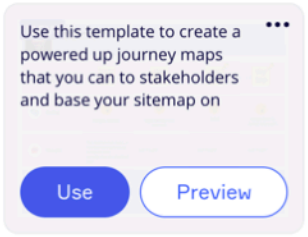
Mind Map



Miro

Flowchart



Hanan A.S.

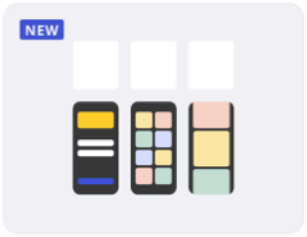
Customer Journey Map

Research & Design

See all

Miro

Customer Touchpoint Map



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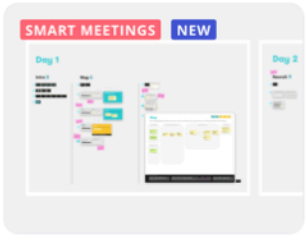
App Wireframe



Jake Knapp

Design Sprint

Here are the pain/gain points throughout current customer journey of Ivy, our persona:

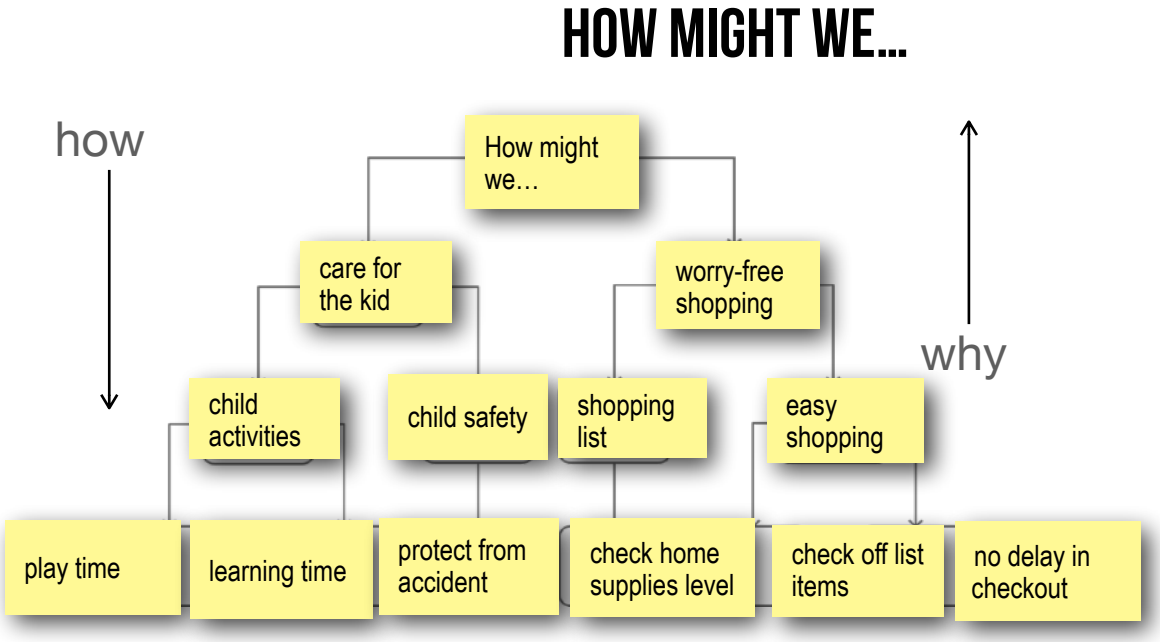
Hard to find shopping items.	Take a long time to checkout.	Take care of kids while shopping.	Not knowing availability of items.
Not knowing what lacks at home.	Take time to check stocks at home.	Too many things to carry.	Forget to buy some of the items.

Define a problem statement based on POV.

https://www.youtube.com/watch?v=kT0ZqwdPYRM

Why How Laddering Tree

Source: d.school



How might we make a full time mom (who) address the problem of caring for her kid's safety and efficiently finishing up her shopping (what) to achieve the goal of making good use of her time to keep the family and herself happy (why)?

Point of View

User/Customer (Who)	Need (What)	Goal (Why)
House wife **Example**	Caring for her kid's well being and completing her daily family routines. Developing her own interests and well being.	Making good use of her time to keep the family and herself happy. Don't have to be torn between the two goals. - Functional - Emotional - Social

Source: Interaction Design Foundation

Problem Statement

How might we make a full time mom (who/user) address the problem of caring for her kid's safety and efficiently finishing up her shopping at the supermarket (what/need) to achieve the goal of making good use of her time to keep the family and herself happy (why/goal)?

Problem Statement

How might we make a full time mom (who/user) address the problem of caring for her kid's safety and efficiently finishing up her shopping (what/need) to achieve the goal of making good use of her time to keep the family and herself happy (why/goal)?

Problem Statement

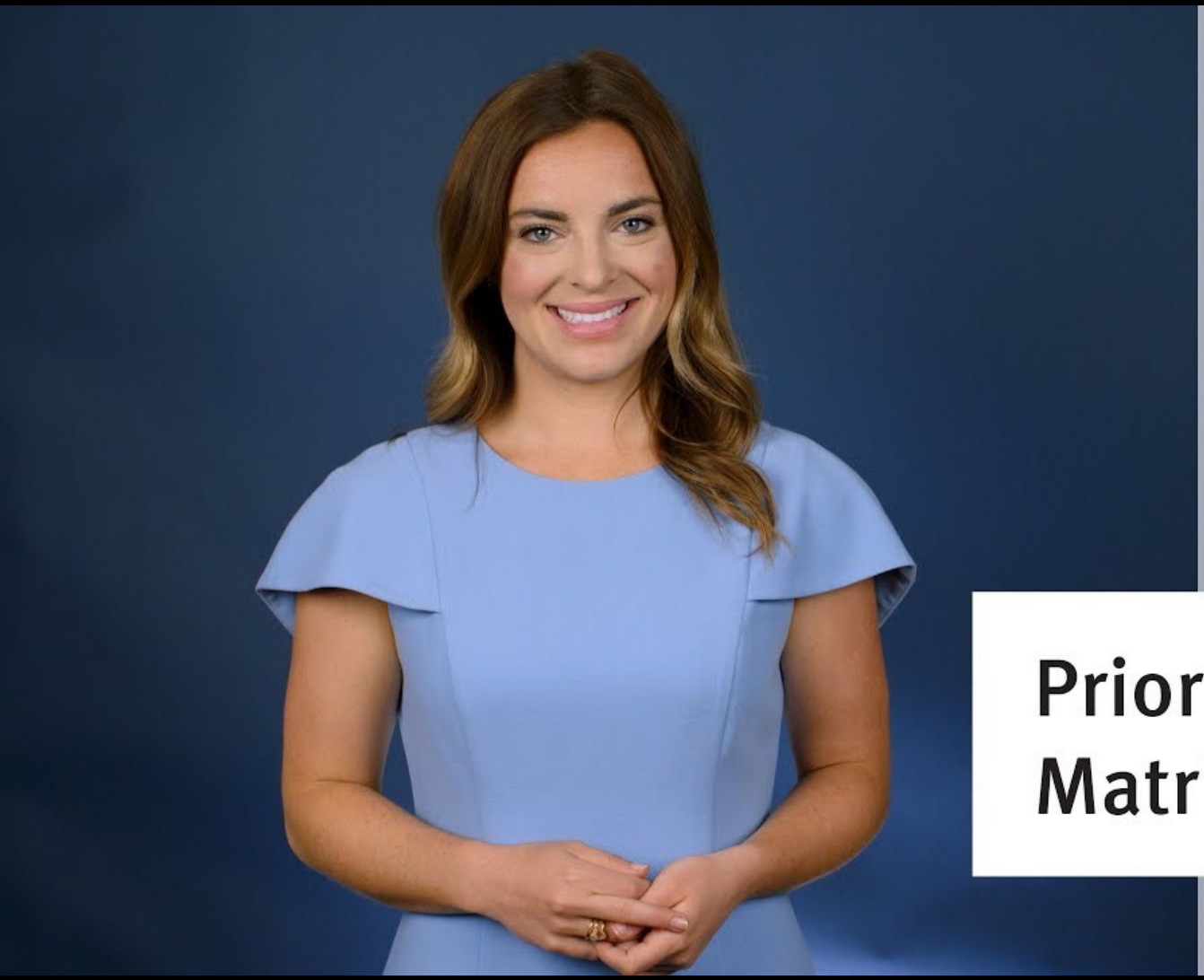
How might we make _____ (who/user) address the problem of _____ _____ (what/need) to achieve the goal of _____ (why/goal)?

1. Be specific about the persona (segment the persona).
2. Pay attention to the context and touch points.
3. Find common needs (jobs to be done) across persona for exploring product-market fit (MVP x MVS).
4. Define job to be done (Functional, Emotional, Social)
5. Go deep to define the job to be done by keep asking why multiple times.
6. Be specific about the gain and pain by keep asking how multiple times until the result can be quantified.

“Problem” Hypothesis to be validated.

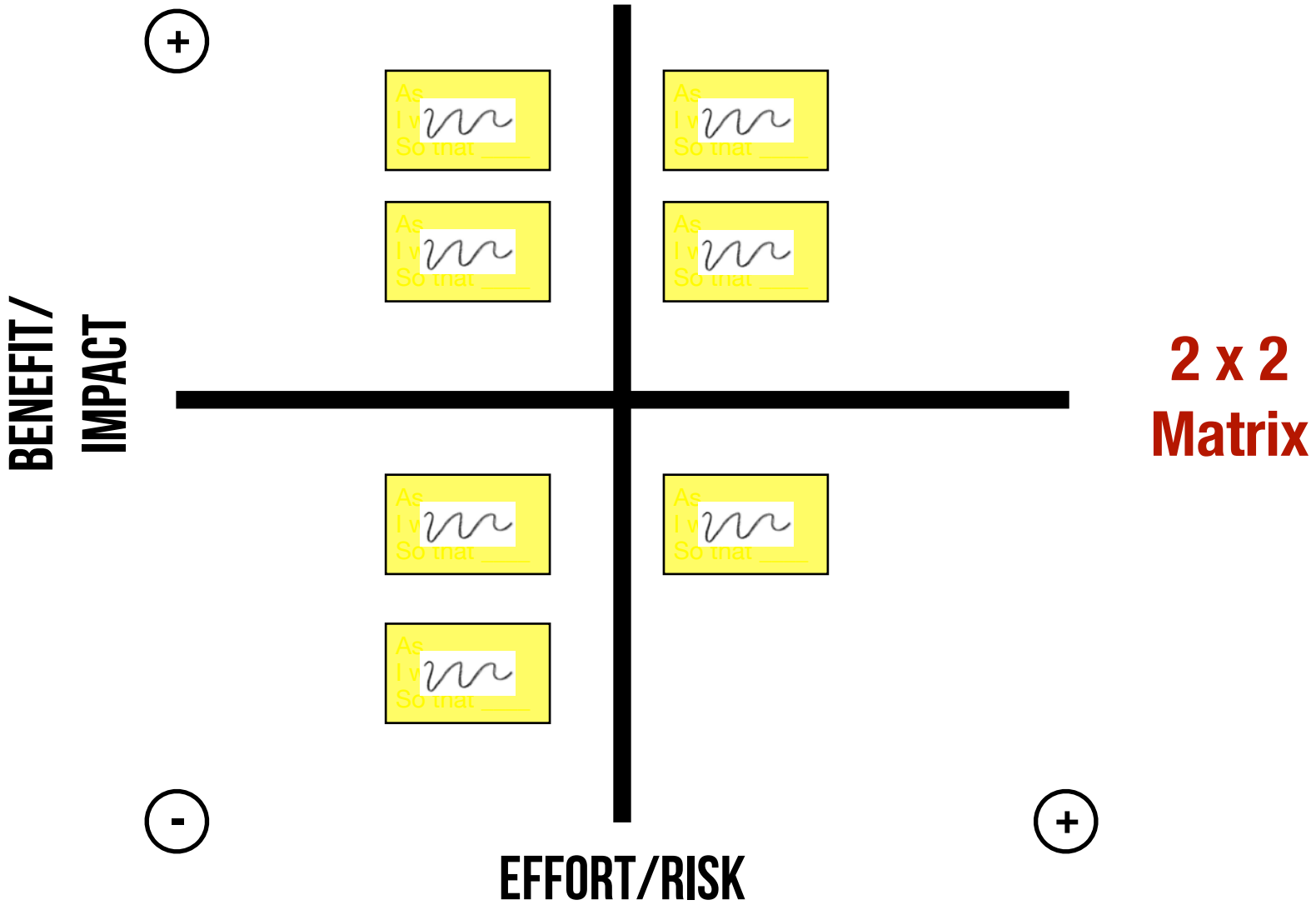
- ✓ Hard to find shopping items.
- ✓ Take a long time to checkout.
- ✓ Take care of kids while shopping.
- ✓ Not knowing availability of items at the shop.
- ✓ Not knowing what is lacking at home.
- ✓ Take time to check stocks at home.
- ✓ Too many things to carry.
- ✓ Forget to buy some of the items.

Which hypothesis (needs and pain points) to test first?



NN/g

Prioritization Matrices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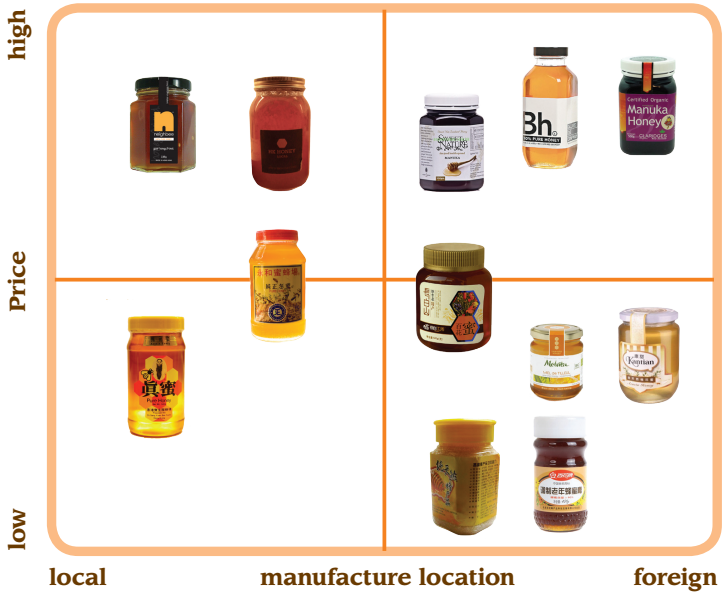
BENEFIT/
IMPACT
-
+
EFFORT/RISK
2 x 2
Matrix

Creative use of 2 x 2 Matrix for prioritisation.

2 x 2 MATRIX



Source: Neighbee Business Plan Report, School of Design , Swinburne University of Technology

2 x 2 MATRIX

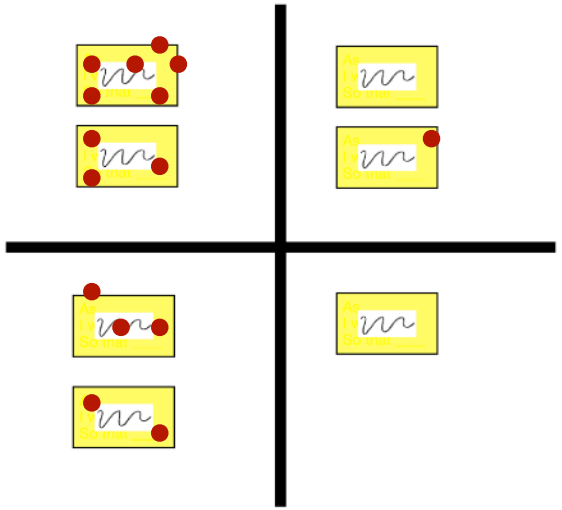
Source: Neighbee Business Plan Report, School of Design , Swinburne University of Technology

Source: https://www.nngroup.com/articles/dot-voting/?lm=design-thinking-agile

State your hypothesis and develop 2 x 2 matrix to help prioritise your validation tests.

"Problem" Hypothesis to be validated.

- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓



2 x 2 Matrix

From journey mapping to
story mapping.

UX AS A JOURNEY

Elements

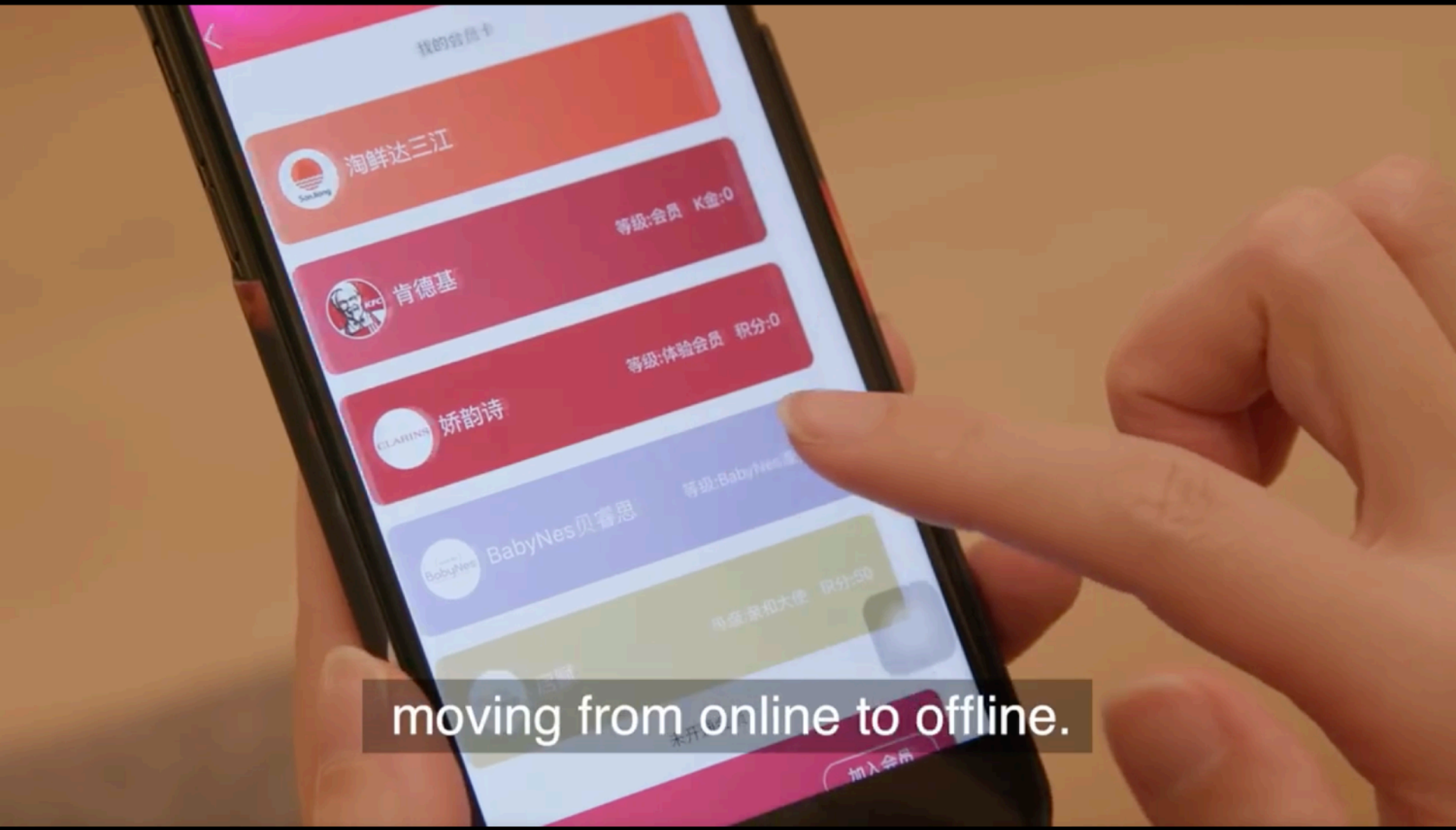
1. Persona
2. Context
3. Artifacts
4. Tasks/Jobs

Structure

1. Problem
2. Alternatives
3. Transformation
4. Synthesis

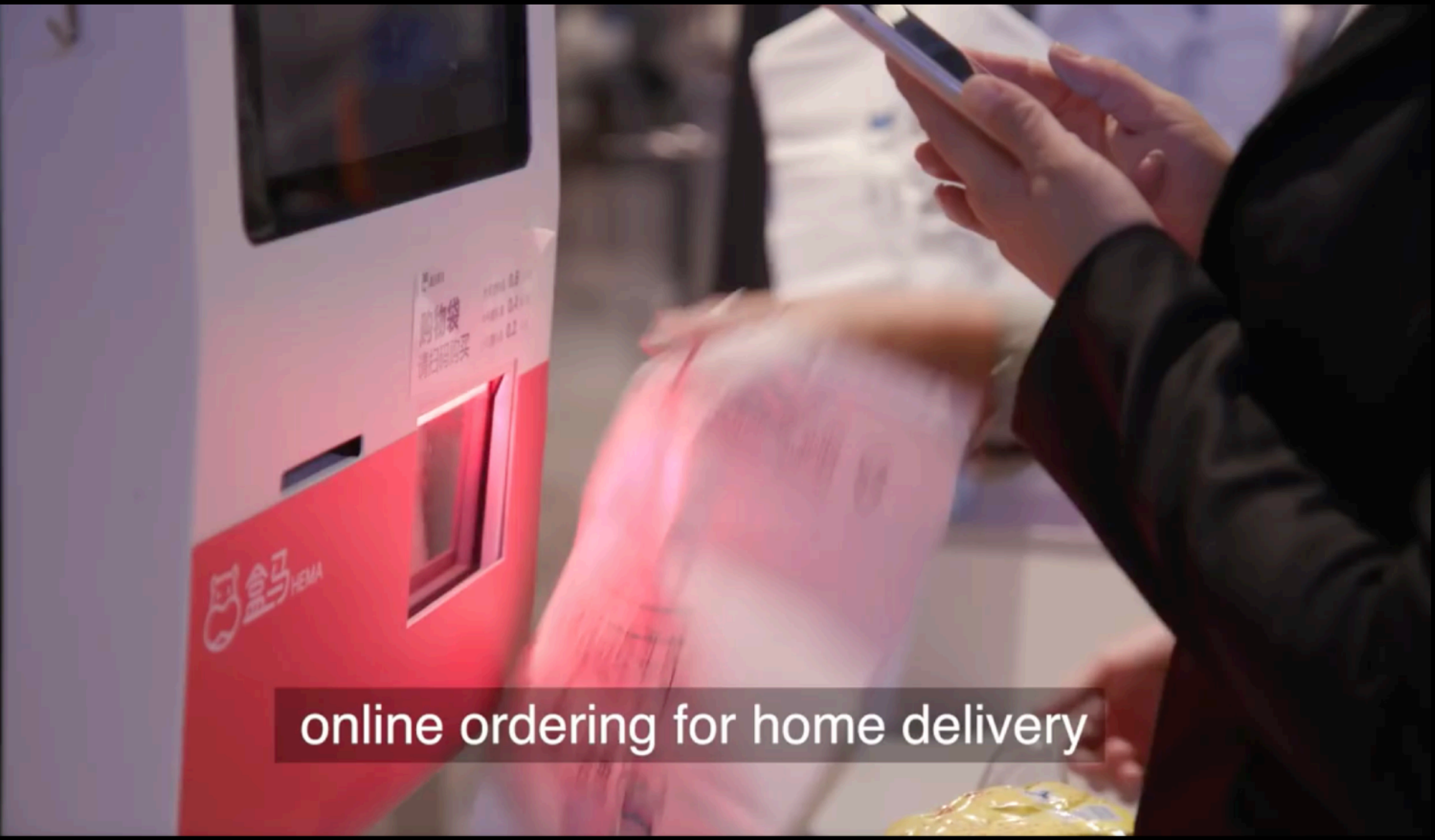
} Current Journey

} Future Journey



Source: Alizilia

Source: Alizilia



Source: Alizilia

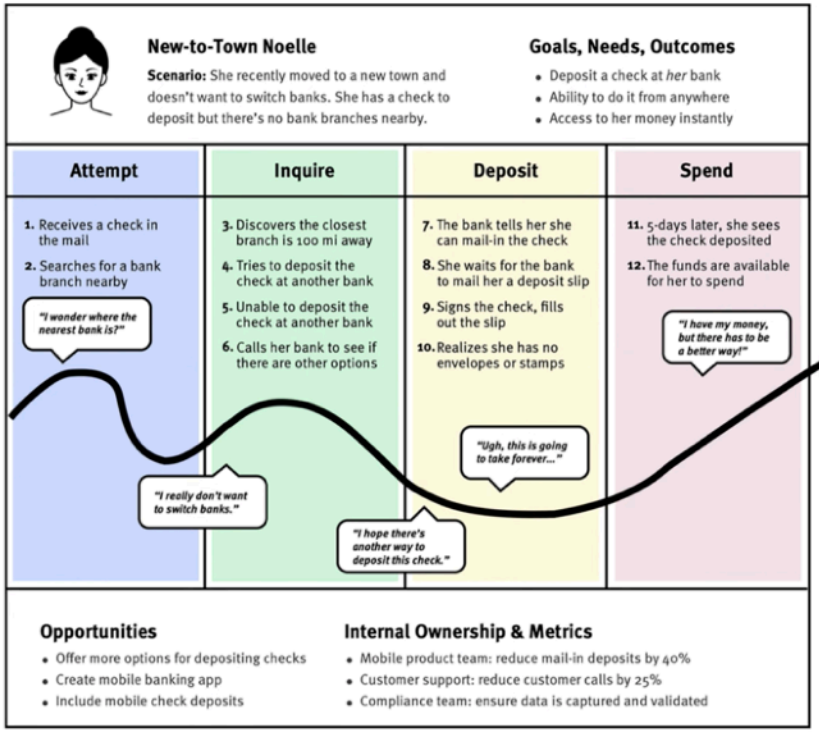
Source: Alizilia

How did the solution come about? How do we know it works in addressing the problem?

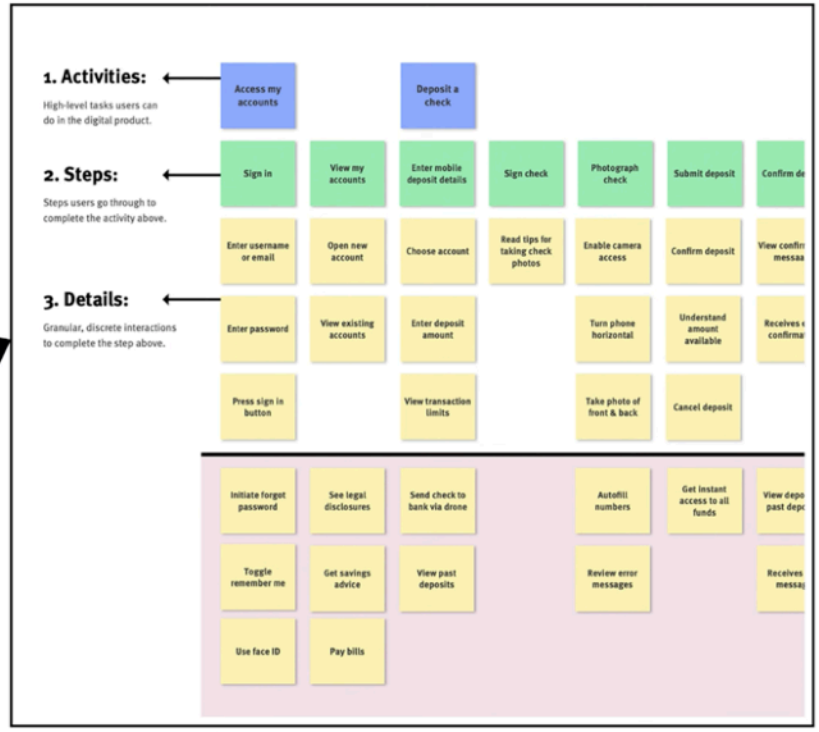
NN/g

Journey vs. Story Maps

Customer Journey Map: Depositing a Check

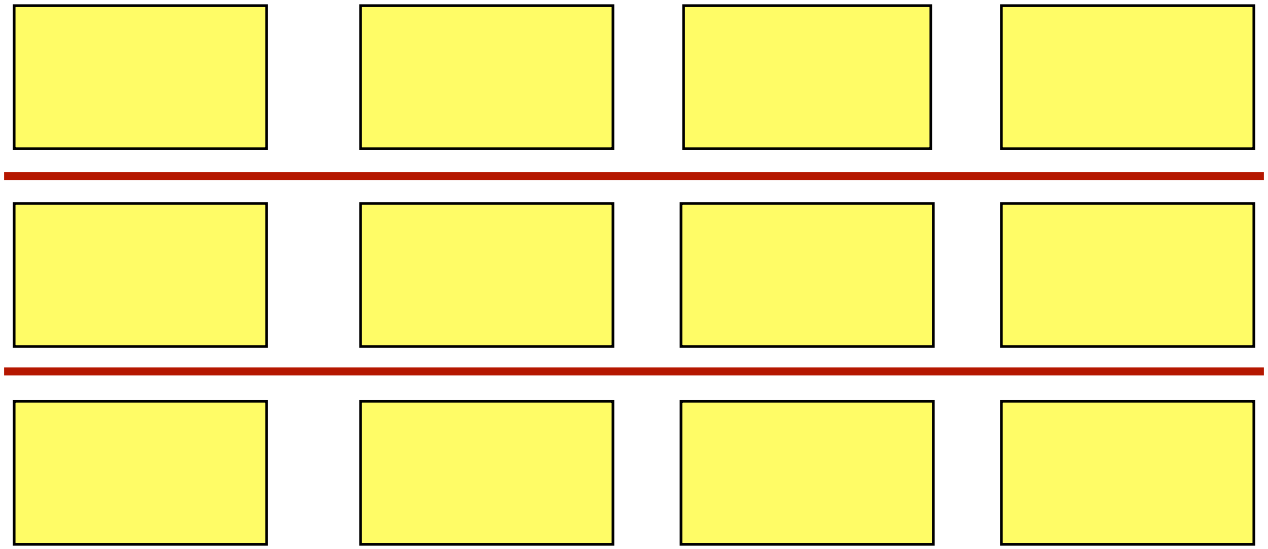


User Story Map: Mobile App for Depositing Checks



Source: NNGroup

Story Cards



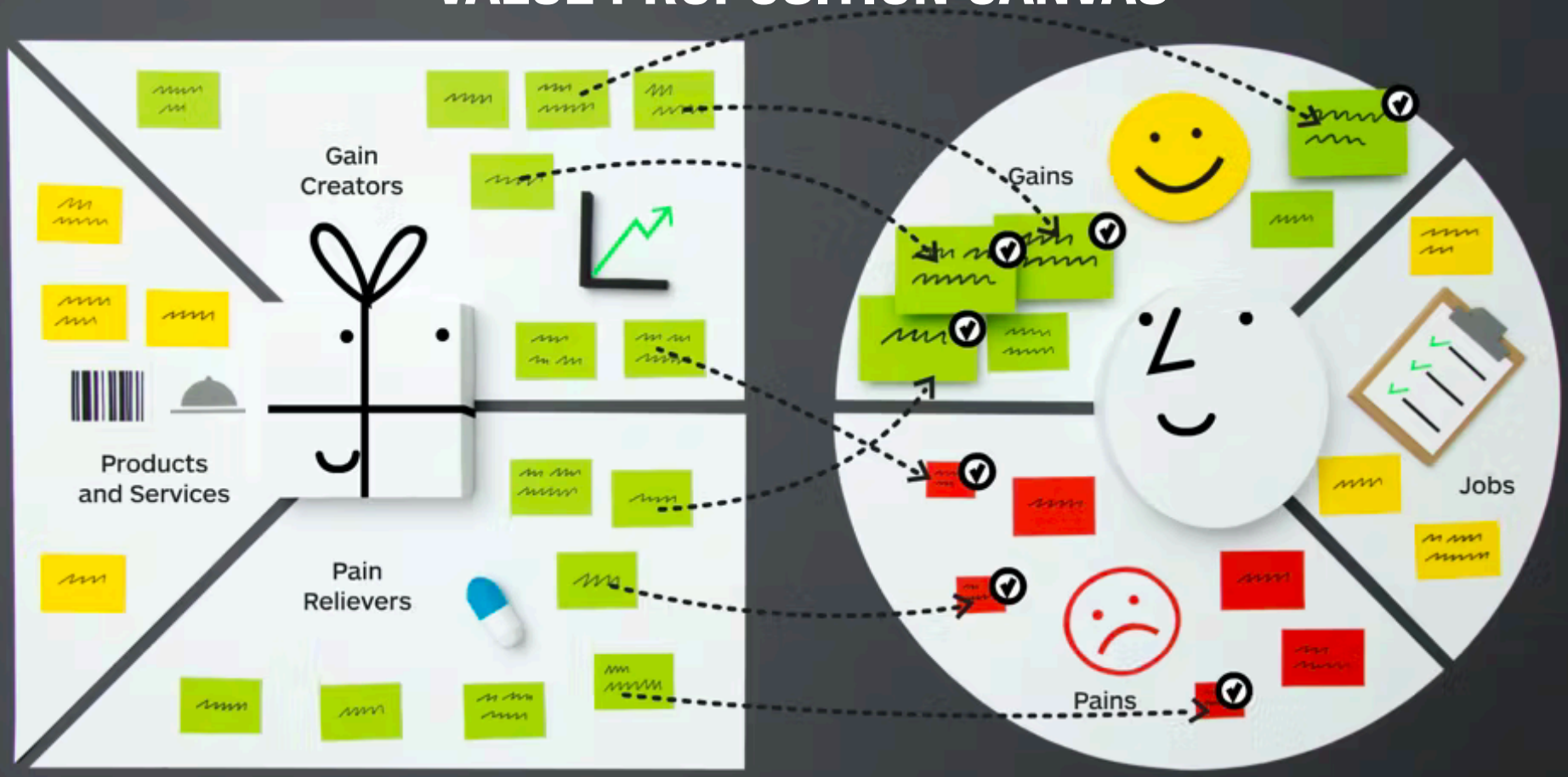
Prioritise product/service features and benefits for development in phases.

How to prioritise the development of solution?

Which hypothesis (set of features and benefits) to test first?

Value Proposition Canvas:
A tool for finding product market fit.

VALUE PROPOSITION CANVAS

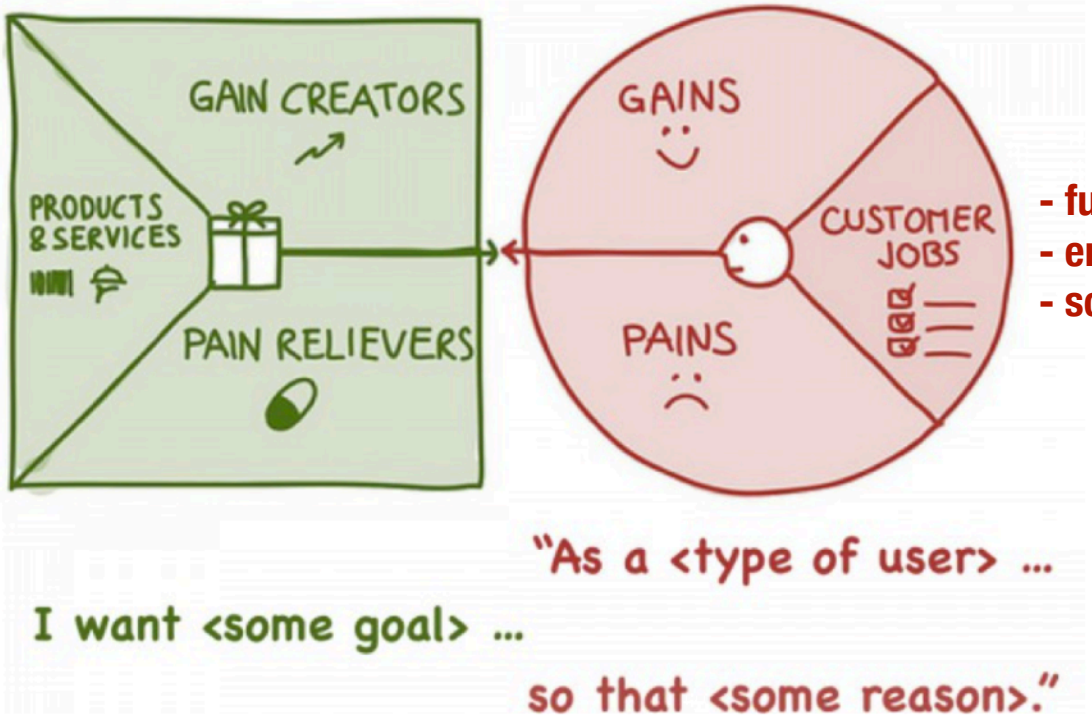


VALUE MAP **CUSTOMER PROFILE**

Source: Strategyzer

Story Map

Useful tips to receive from shops	What items not to be missed?	Deadlines for the offerings	Bargains & discounts available	Directions to get to the destinations	
As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	**Who** **What** **Why**
As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	As ___ I want ✓ So that ____	



- functional
- emotional
- social

Story Card

As a
<certain persona>

I want
<this feature>

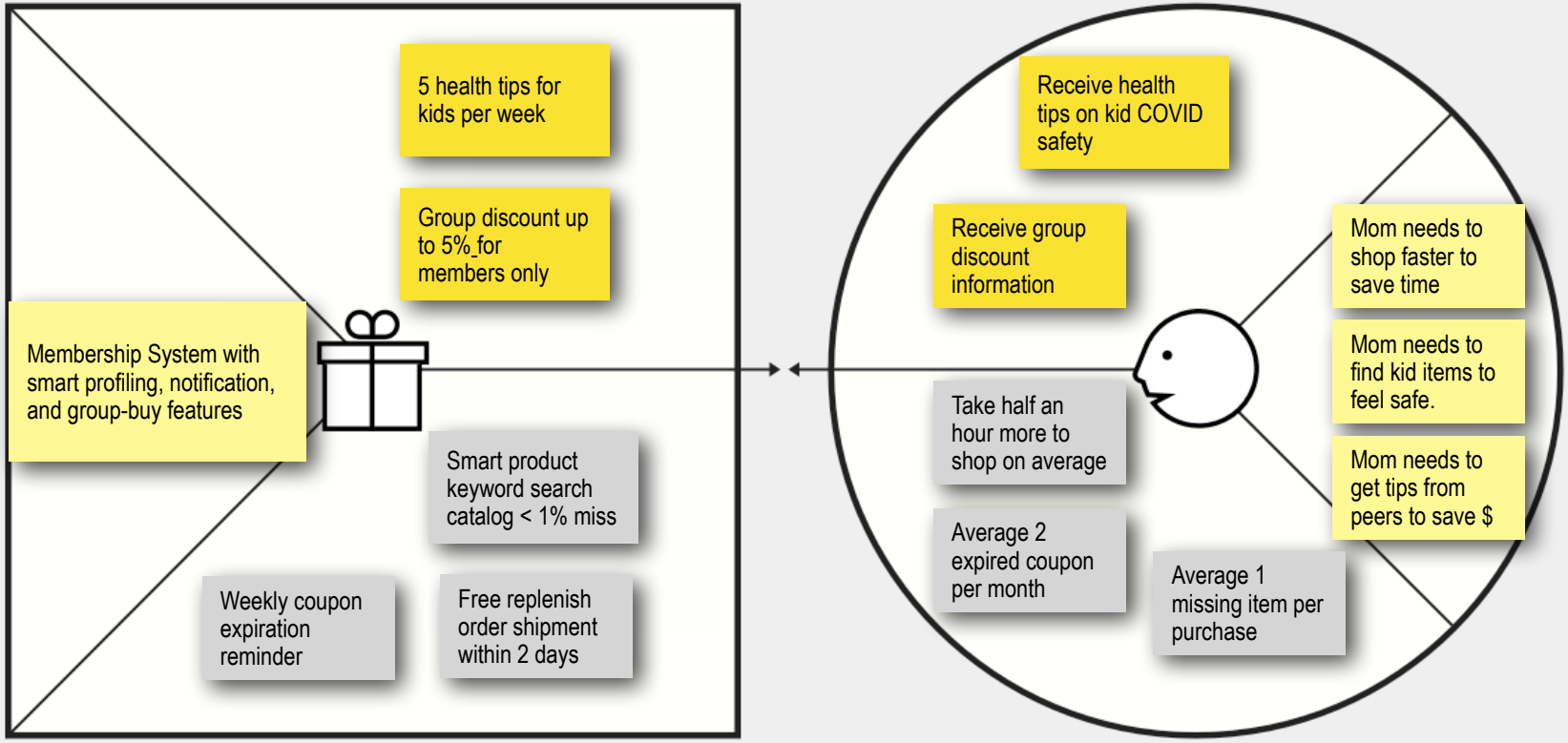
so that I can enjoy
<this benefit>

Feature = Gain Creators & Pain Releivers

Benefit = Increase gain & Reduce pain

Source: How to: Link User Stories to the Value Proposition Canvas by Stefan Haas

The Value Proposition Canvas



Value Map **Customer Profile**

Strategyzer

Hypothesis to be tested

- ✓ Incentive for downloading/activating the app
- ✓ Incentive for using the app regularly
- ✓ Is it easy to find available items?
- ✓ Can it facilitate shopping list preparation?
- ✓ Incentive for accepting home delivery
- ✓ Timely update of app data to reflect latest inventory and price levels
- ✓ Reliable order filling and dispatching
- ✓ On-time delivery to the right place
- ✓ The app will increase sales and reduce costs

Case Study: Redesigning the Lobby Experience

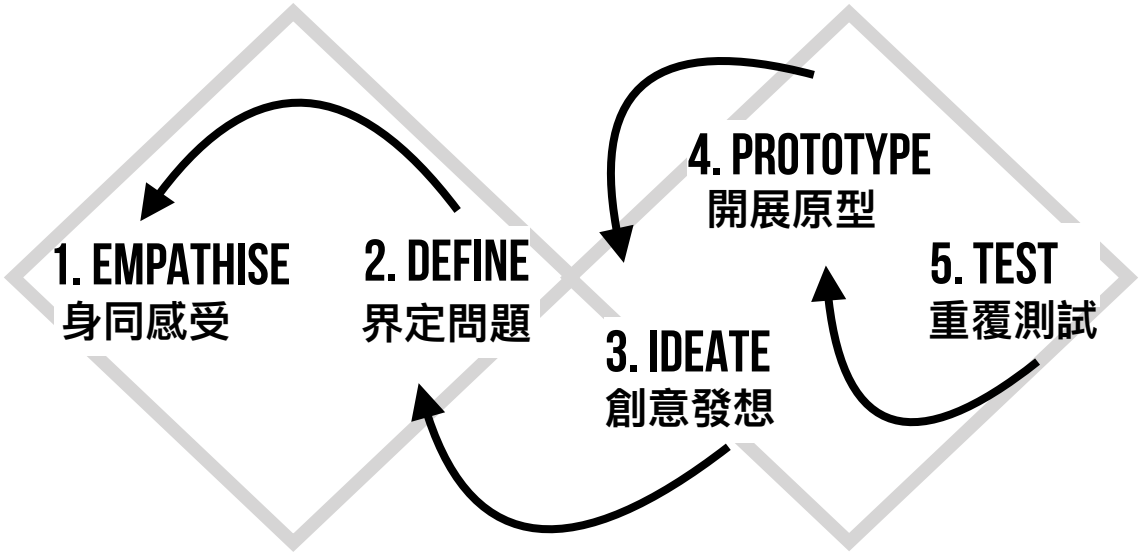
Exploring the Hotel Experience of the Future with Marriott Hotels

Source: MIT Mobile Experience Lab

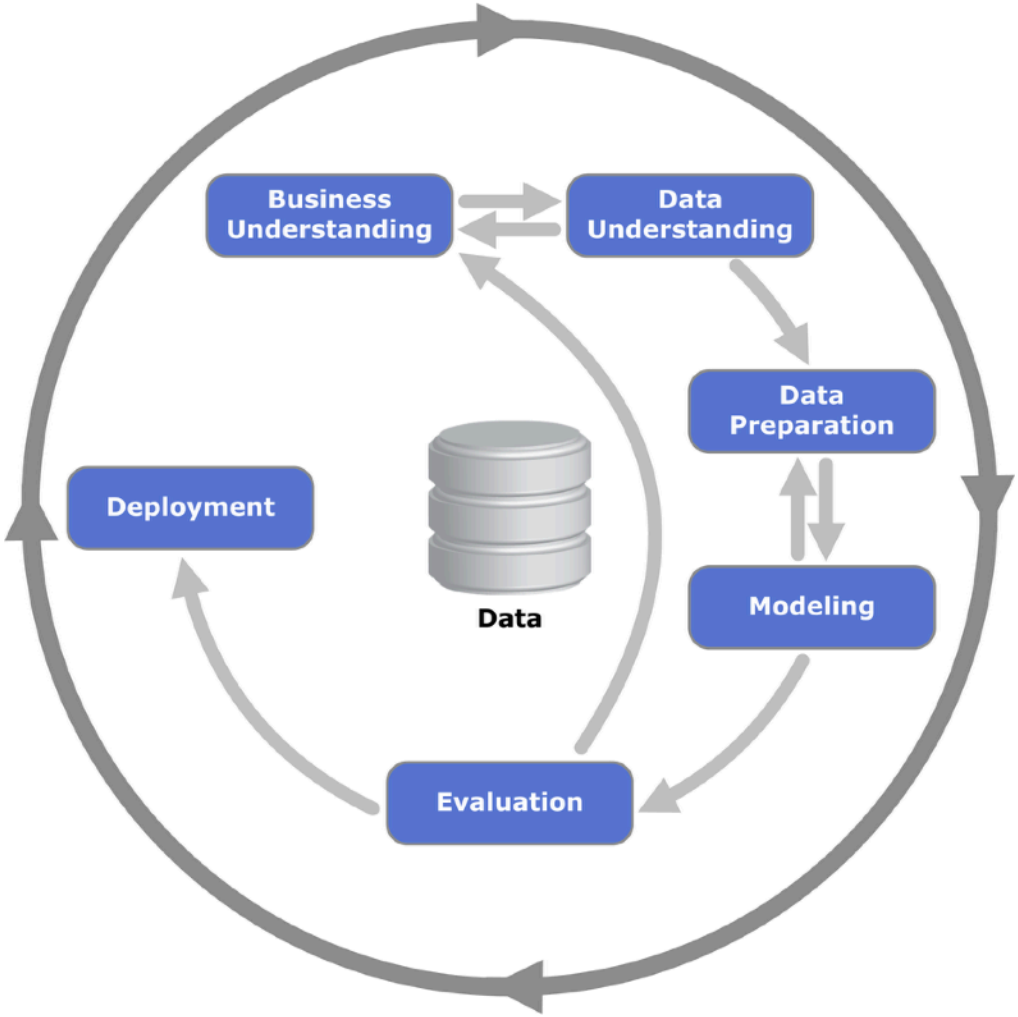
https://design.mit.edu/projects/the-future-hotel-experience

Problem Solving Frameworks

Design Thinking
(Double Diamond Model)



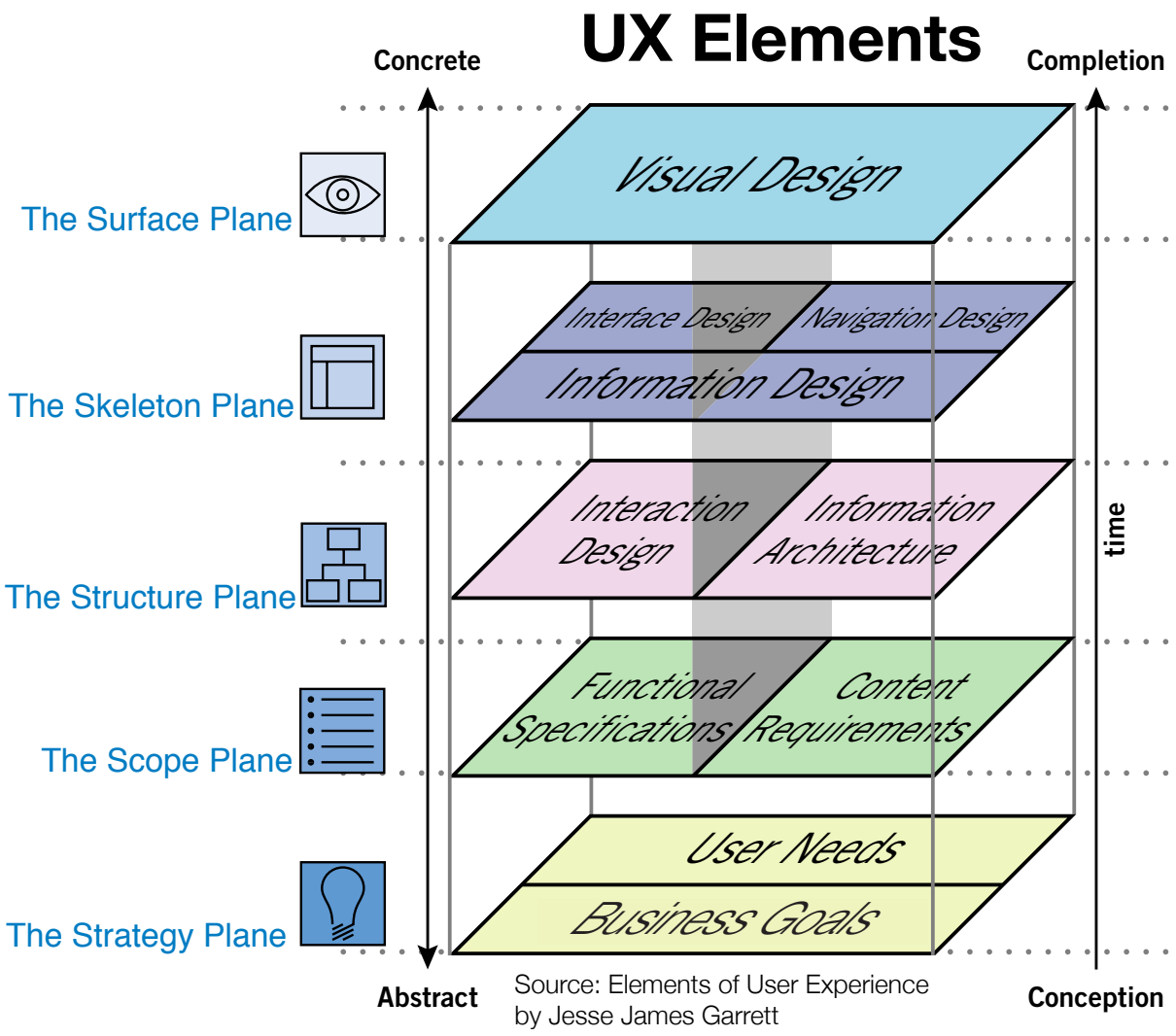
Cross Industry Standard Process of Data Mining (CRISP-DM)



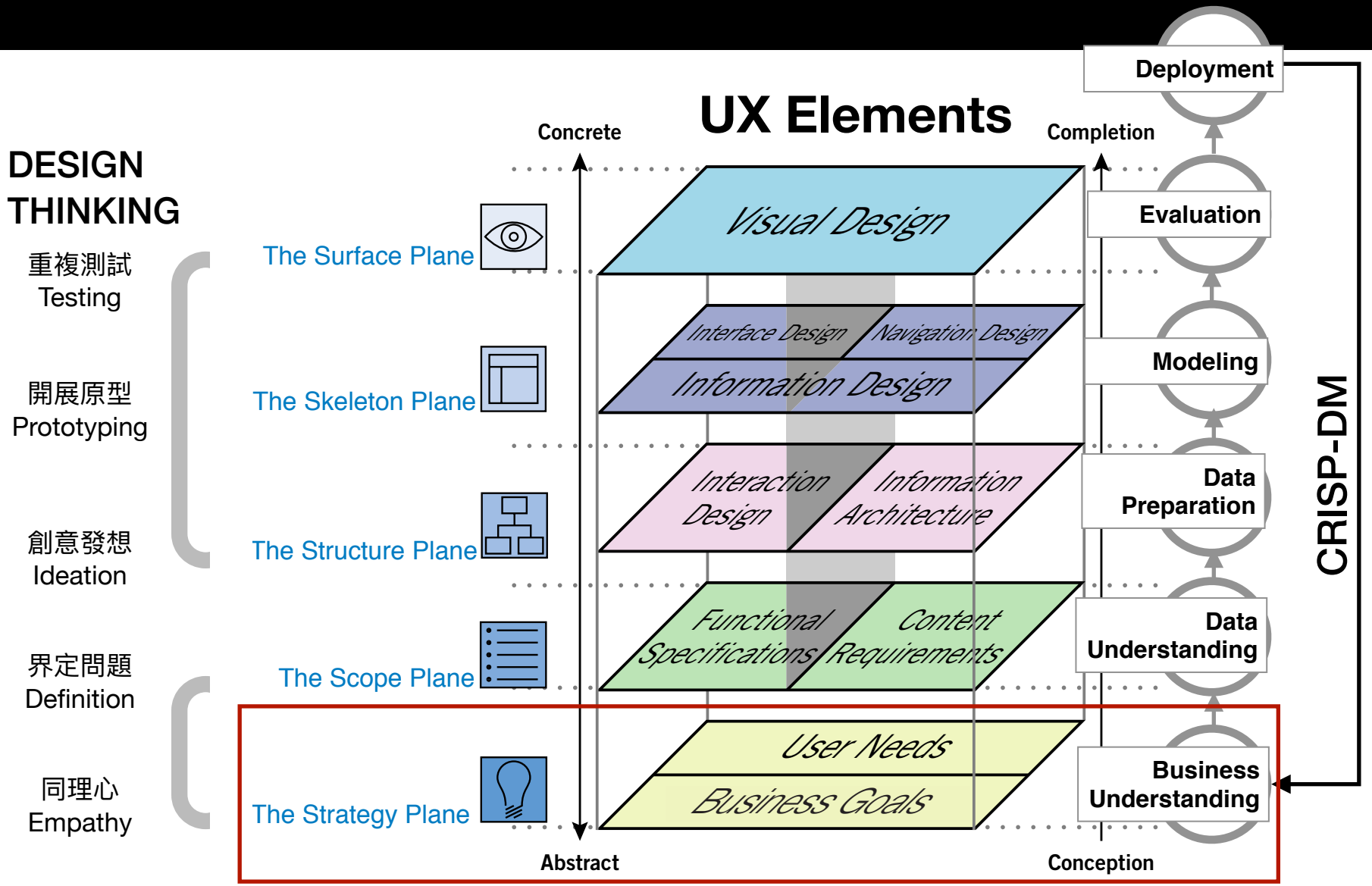
CRISP-DM

Source: Wikimedia

Elements of User Experience


UX Elements
Concrete
Completion
The Surface Plane
The Skeleton Plane
The Structure Plane
The Scope Plane
The Strategy Plane
Visual Design
Interface Design
Navigation Design
Information Design
Interaction Design
Information Architecture
Functional Specifications
Content Requirements
User Needs
Business Goals
time
Abstract
Conception
Source: Elements of User Experience
by Jesse James Garrett

Combining the Frameworks

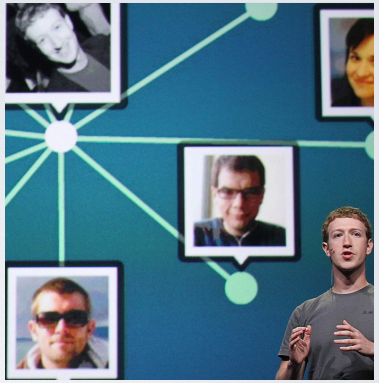


Business Goals

How are the frameworks applied?

Business Goals	Data	Metrics
Increase market share	Market share data	Increase in returned and new customers stays
Increase revenue	Hotel revenue by departments	Increase in revenue by dept by returned and new customers
Increase in ROI from new platform	Investment in new platform	ROI calculated

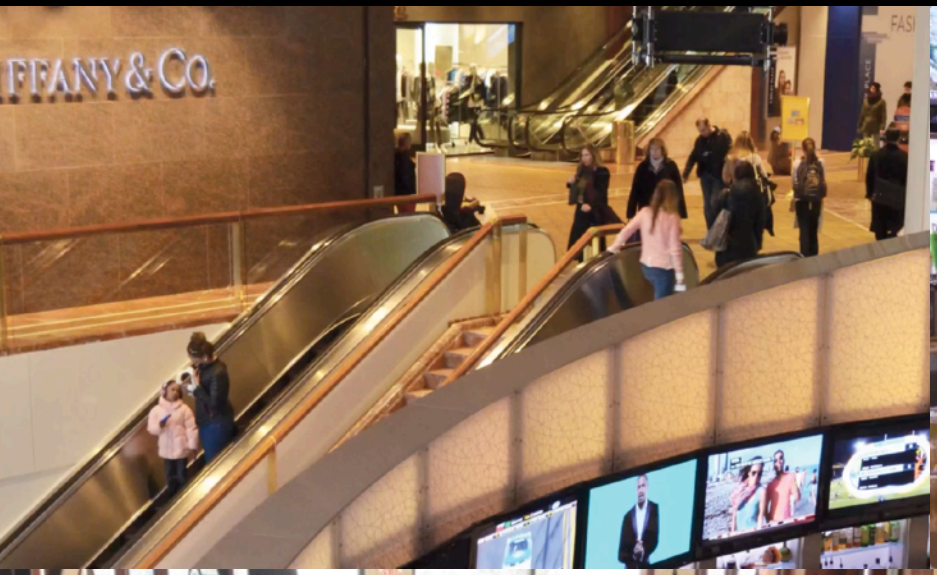
User Needs	Data	Metrics
City adventure with friends	Request for New Friends	App download and activation
Explore new places	Destination inquiry and recommendation data	Rating of destinations recommended
Meet new friends	Profile completion and matching data	Rating of friend recommendation
Enjoy good deals	Inquiry of group booking and discount information	Increase in booking through the platform



FIELD STUDY OBSERVATION AT THE HOTEL

We noticed a desire for customer autonomy, contextualized experiences, and public privacy.

Source: MIT Mobile Experience Lab



Source: MIT Mobile Experience Lab

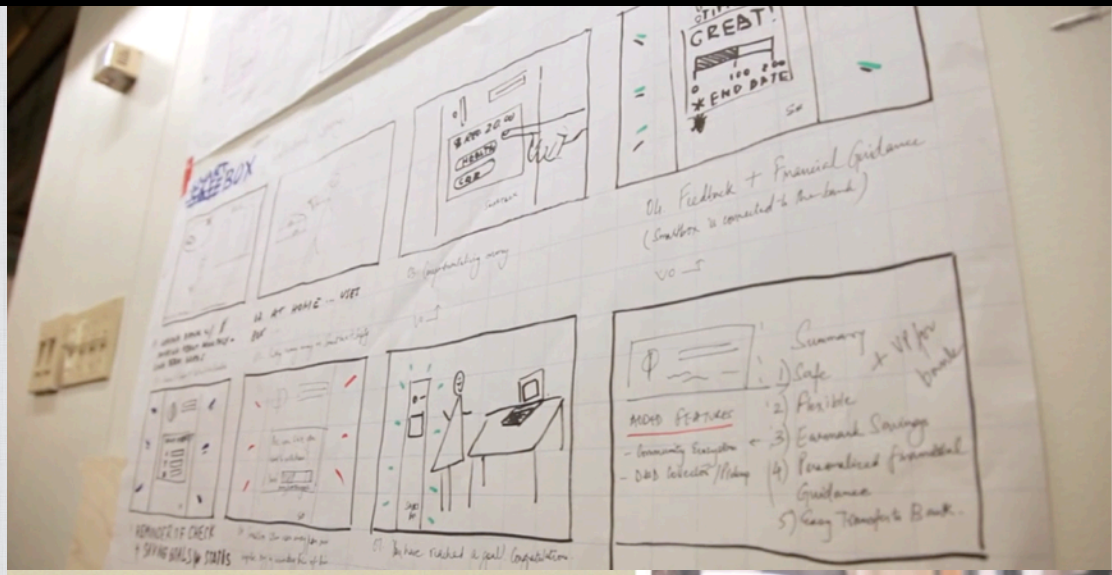
avid social explorer

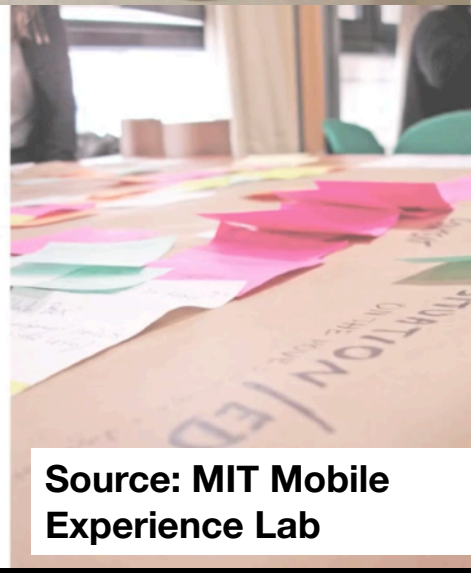
Gen Y travelers seeking personalized yet serendipitous experiences, good company to share them with, and the ability to capture and celebrate them.

bored lobbygoer in transition

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

Persona Types





Source: MIT Mobile Experience Lab

How can Marriott regain the market from Airbnb?

CURRENT CUSTOMER JOURNEY MAP

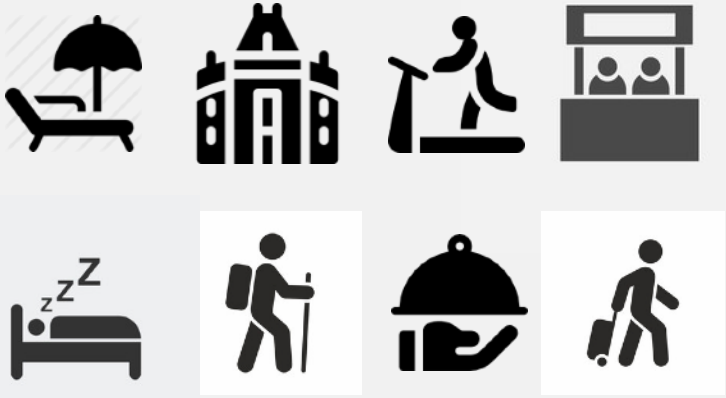
HOME

LOBBY

ROOM

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

Check-in.



BOOKING

CHECK-IN

VISIT DESTINATIONS

RETURN

Adapted from: MIT Mobile Experience Lab

PROBLEM STATEMENT:

How might we make marriott guests feel like nodes within a network while encouraging interactions in the lobby space?

Source: MIT Mobile Experience Lab

Future Journey Mapping

CURRENT CUSTOMER JOURNEY MAP

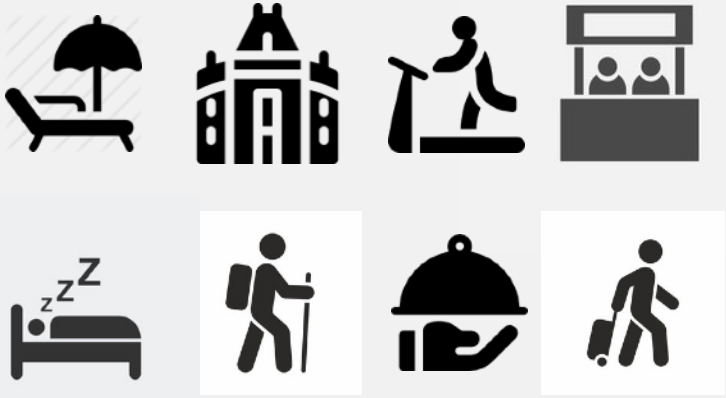
HOME

LOBBY

ROOM

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

Check-in.



BOOKING

CHECK-IN

VISIT DESTINATIONS

RETURN

Adapted from: MIT Mobile Experience Lab

FUTURE CUSTOMER JOURNEY MAP

HOME

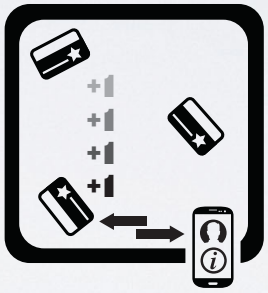
LOBBY

ROOM

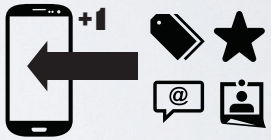
INTERACTIONS OUTSIDE HOTEL

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

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



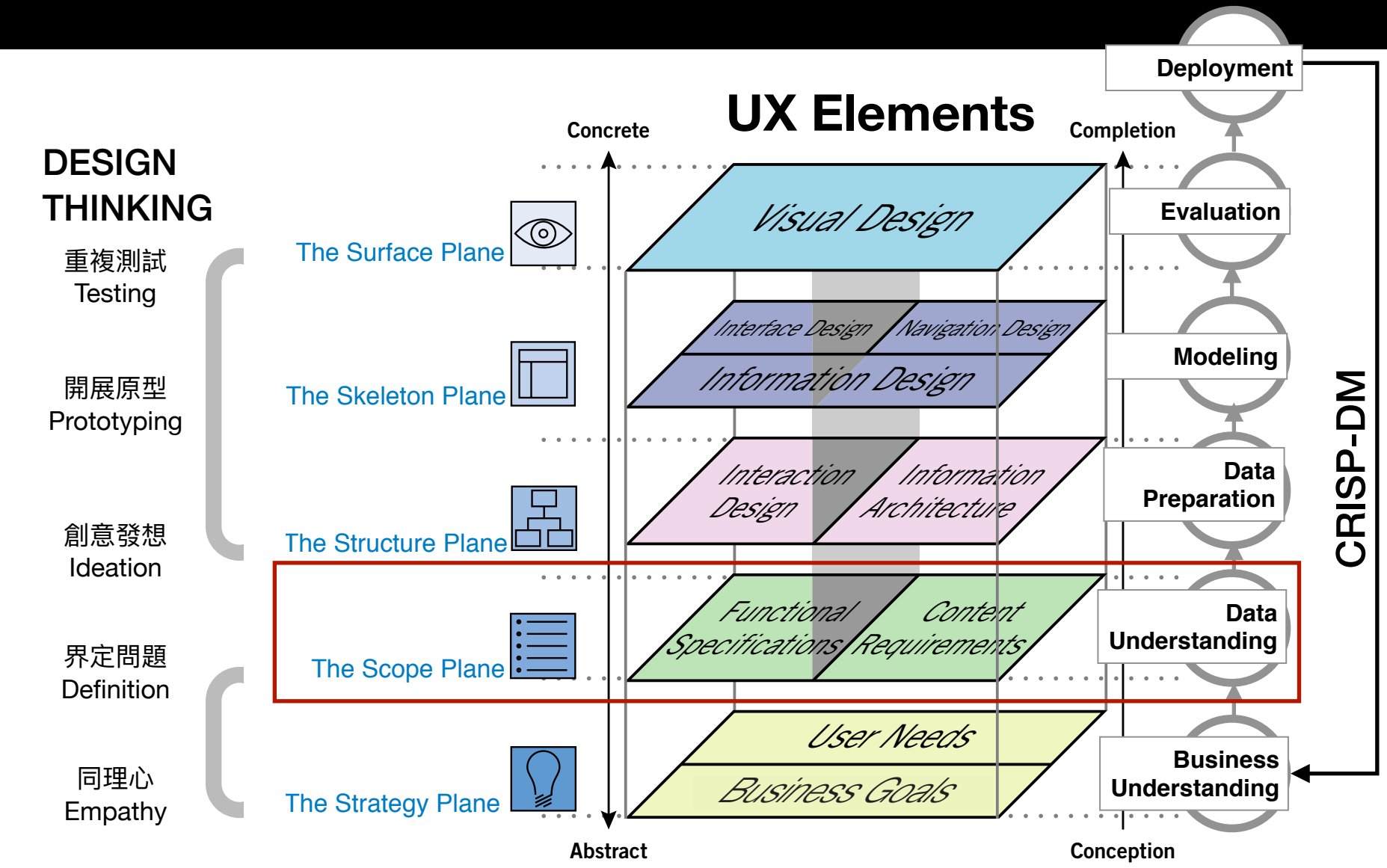
(Can be done in lobby or room) Set availability via orientation of card. (Lobby only) Loyalty points awarded to cards at the same table. Table lights up to show activity, interests shown on table & lobby display map. Profiles added to app network.



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

BOOKING | CHECK-IN | MEETUP | RETURN

Source: MIT Mobile Experience Lab



Business Goals

From Story Map to Information Architecture

FUTURE CUSTOMER JOURNEY MAP

HOME

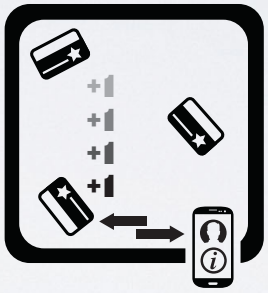
LOBBY

ROOM

INTERACTIONS OUTSIDE HOTEL

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

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



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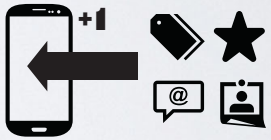


Prompted by app to tag places visited, ratings & social media for points — added to in-app database of recommendations.

BOOKING | CHECK-IN | MEETUP | RETURN

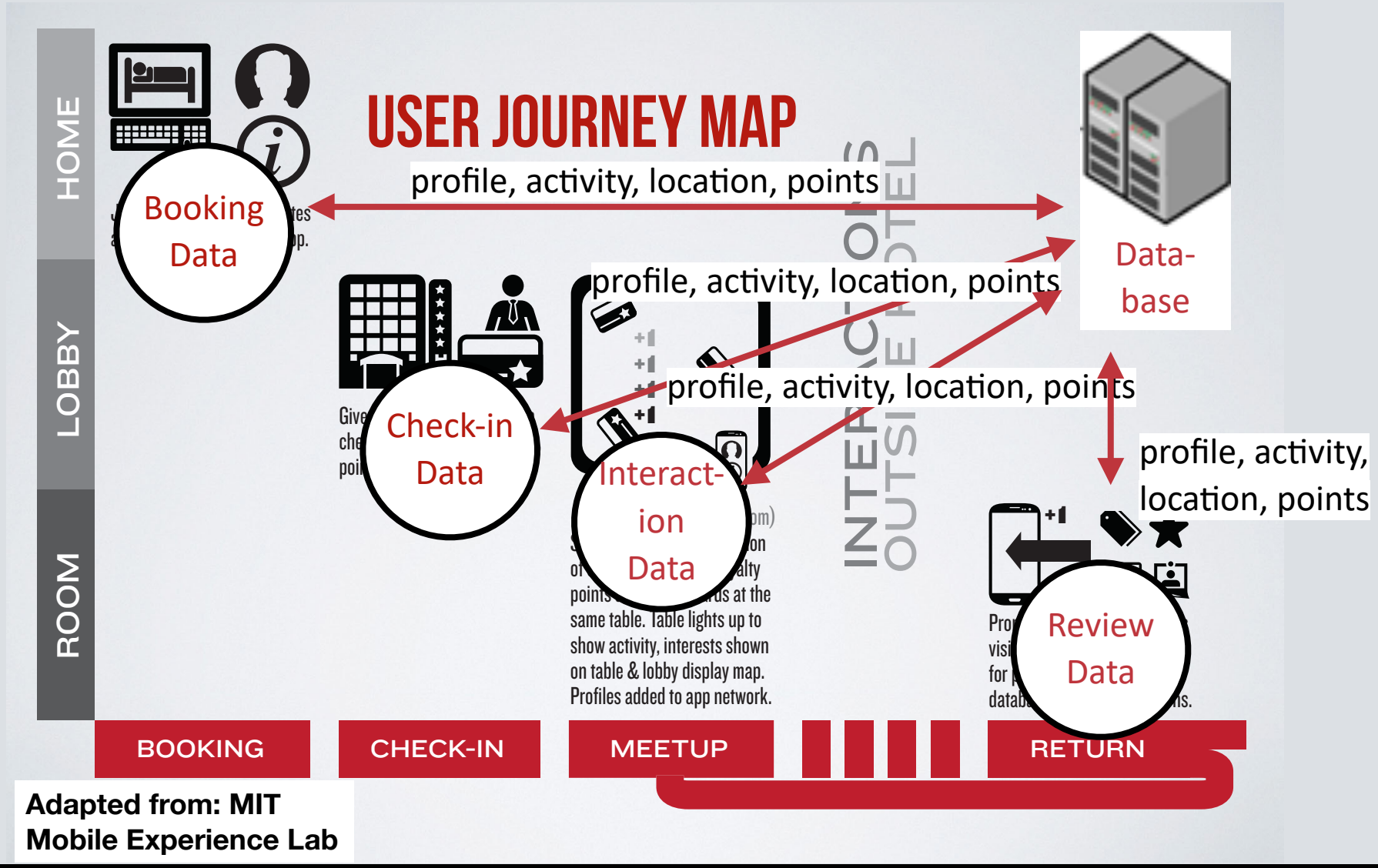
Source: MIT Mobile Experience Lab

Throughout the journey, what customer's pain points did the MIT team have to address?

Which hotel provides best deal?	What new places not to be missed?	What hotel services to be enjoyed?	Interesting people to meet?
Important things to get done	Opening hours of hot destinations	Directions to get to the destinations	Bargains and discounts available

Throughout the journey, what data points did the MIT team have to plan for?

Hotel booking information and packages	Information of nearby destinations	Hotel services and charges	Guest profile information for matching
Group booking information for the guests	App download and activation	Comments and likes of experience	Rating of companion matched



Adapted from: MIT Mobile Experience Lab

“Information architecture (IA) **focuses on organizing, structuring, and labeling content in an effective and sustainable way**. The goal is to help users find information and complete tasks.”

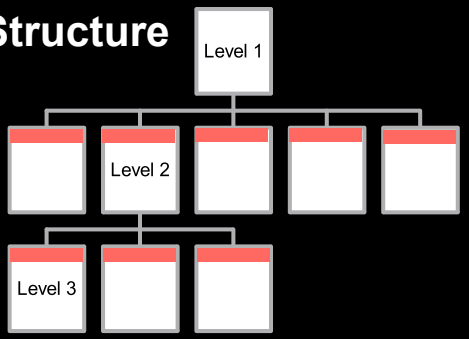
- **https://www.usability.gov**

“…IA informs the content strategy through identifying word choice as well as informing user interface design and interaction design through playing a role in the wireframing and prototyping processes.”

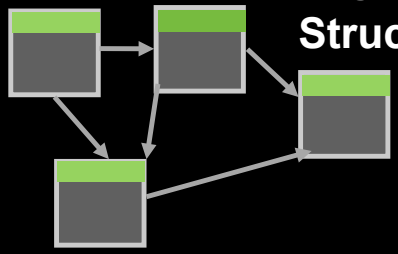
- **https://www.usability.gov**

Information Architecture

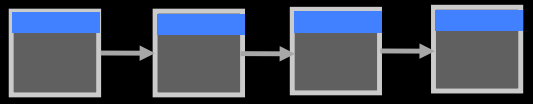
Hierarchical Structure



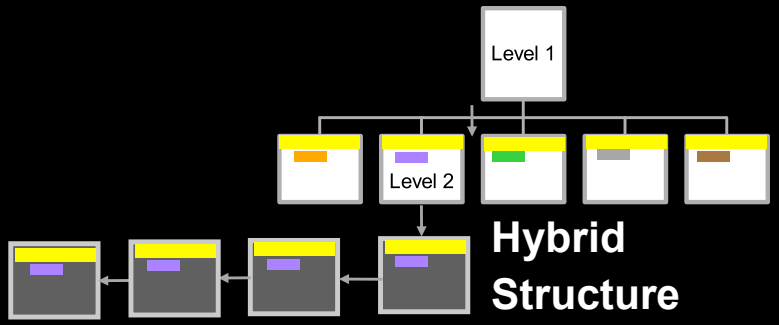
Organic Structure



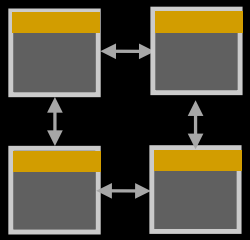
Sequential Structure

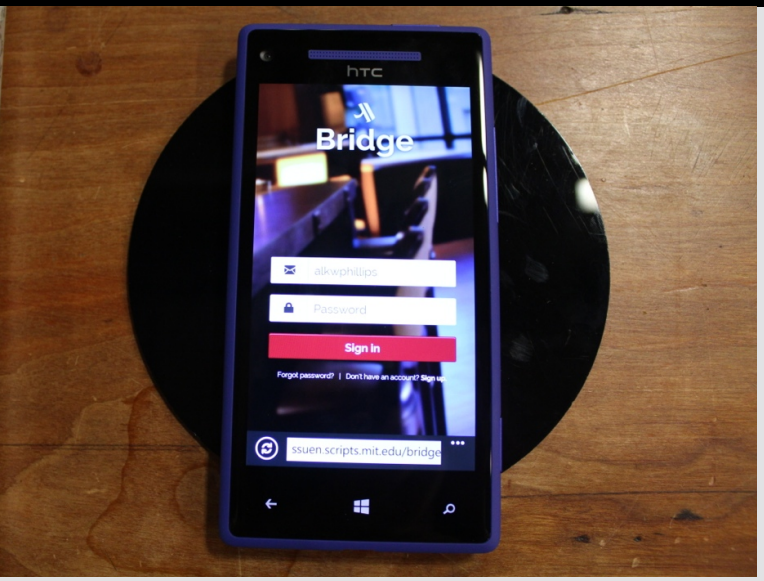


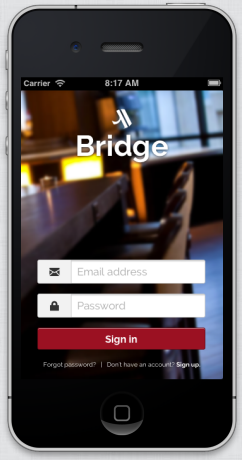
Hybrid Structure

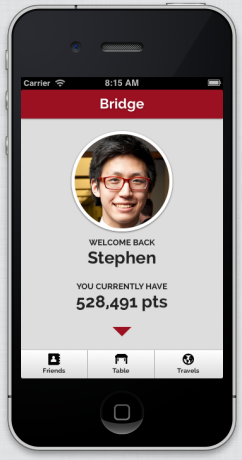


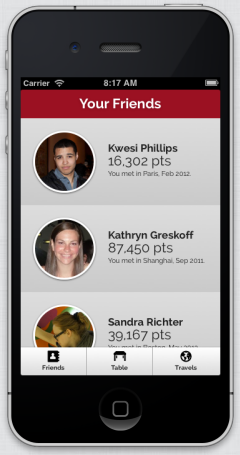
Matrix Structure

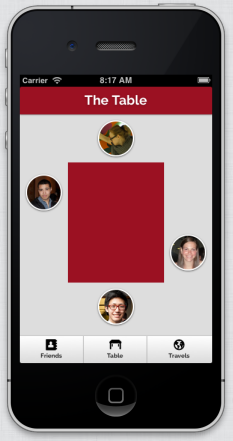






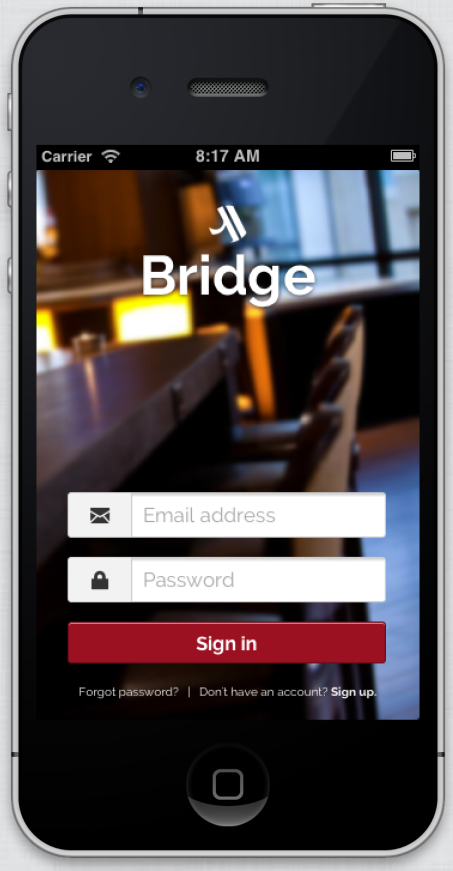


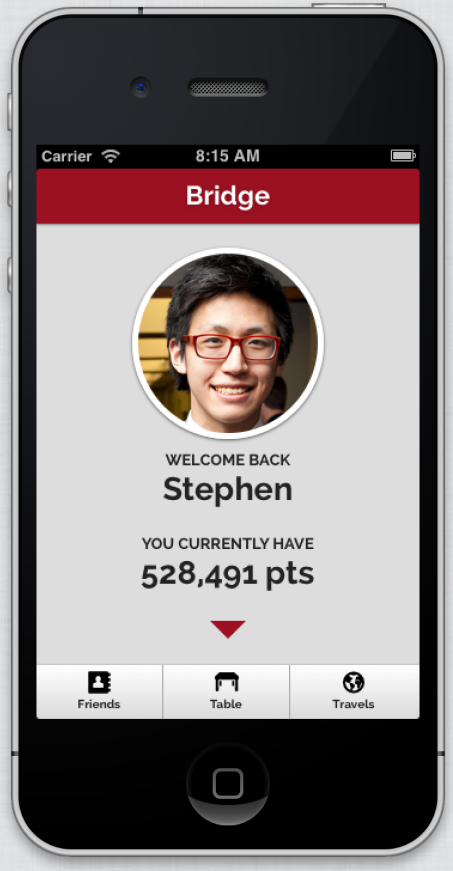


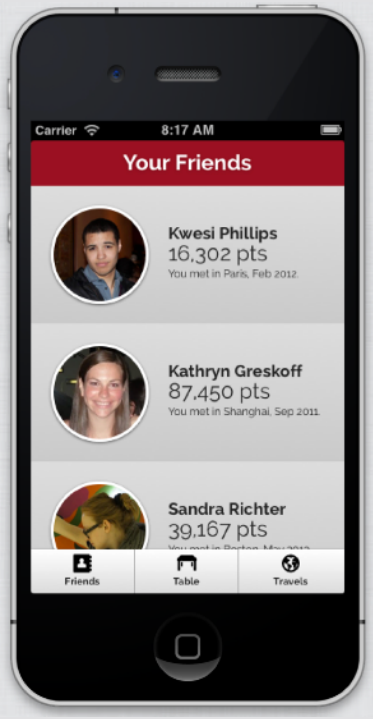


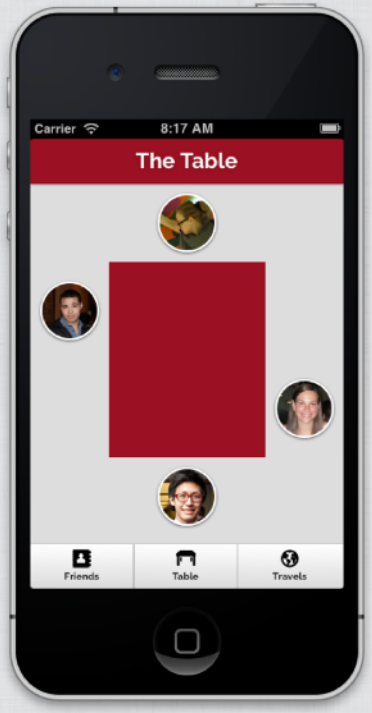
MOCK-UP
DIGITAL EXPERIENCE

Source: MIT Mobile Experience Lab


Carrier
8:17 AM
Bridge
Email address
Password
Sign in
Forgot password? | Don't have an account? Sign up.

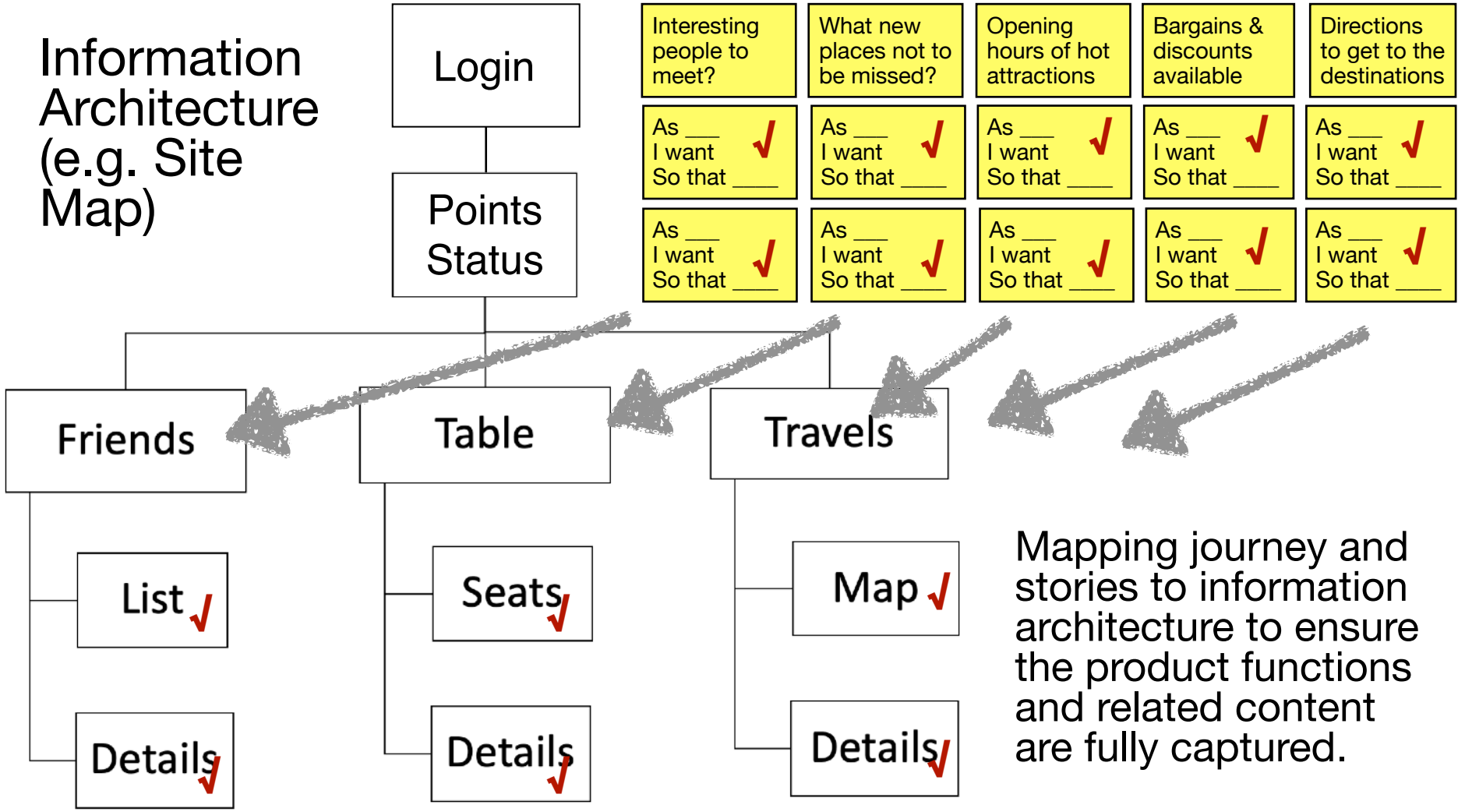

Carrier
8:15 AM
Bridge
WELCOME BACK
Stephen
YOU CURRENTLY HAVE
528,491 pts
Friends
Table
Travels


Carrier
8:17 AM
Your Friends
Kwesi Phillips
16,302 pts
You met in Paris, Feb 2012.
Kathryn Greskoff
87,450 pts
You met in Shanghai, Sep 2011.
Sandra Richter
39,167 pts
Friends
Table
Travels

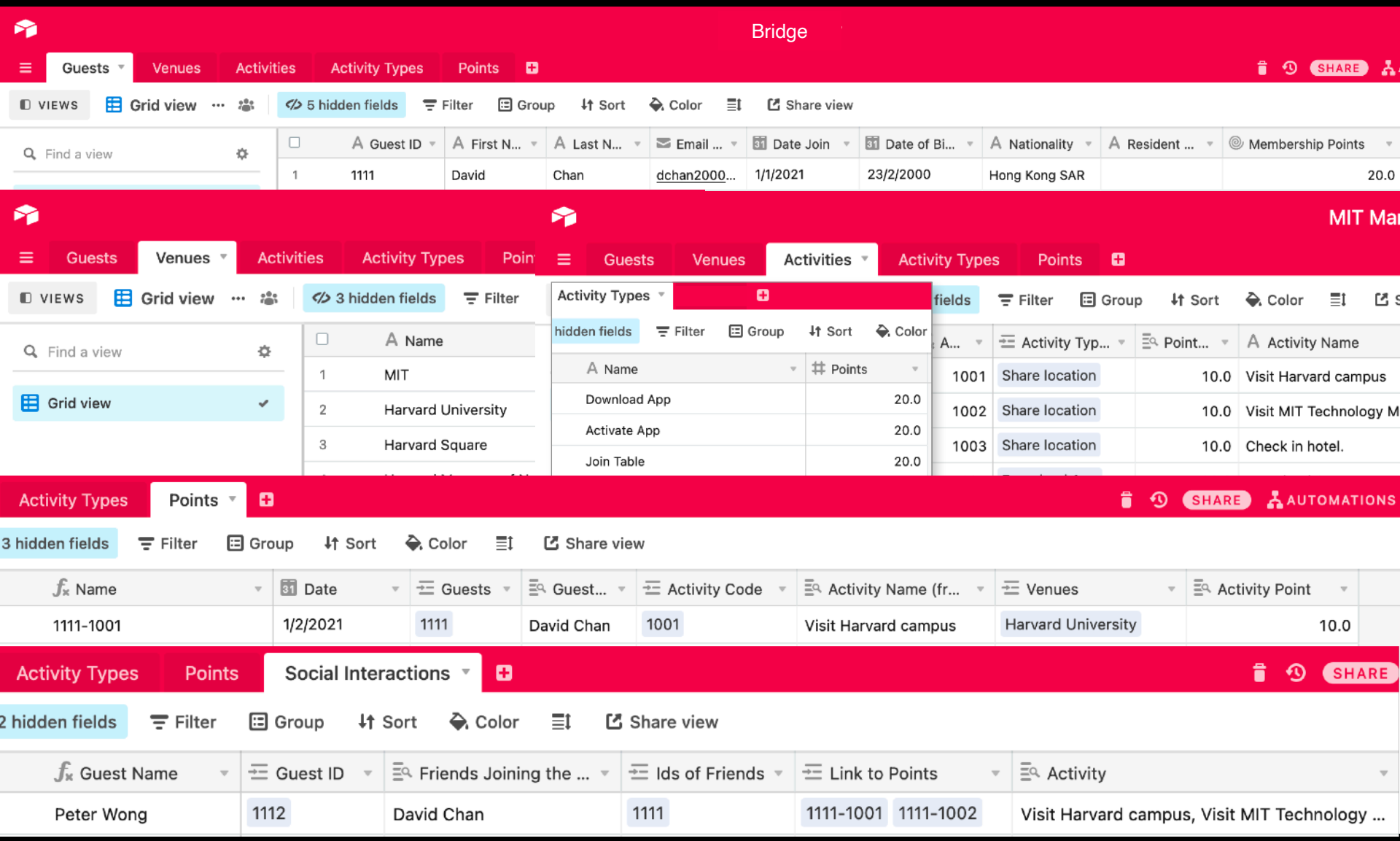

Carrier
8:17 AM
The Table
Friends
Table
Travels


Carrier
8:17 AM
Your Travels
Friends
Table
Travels

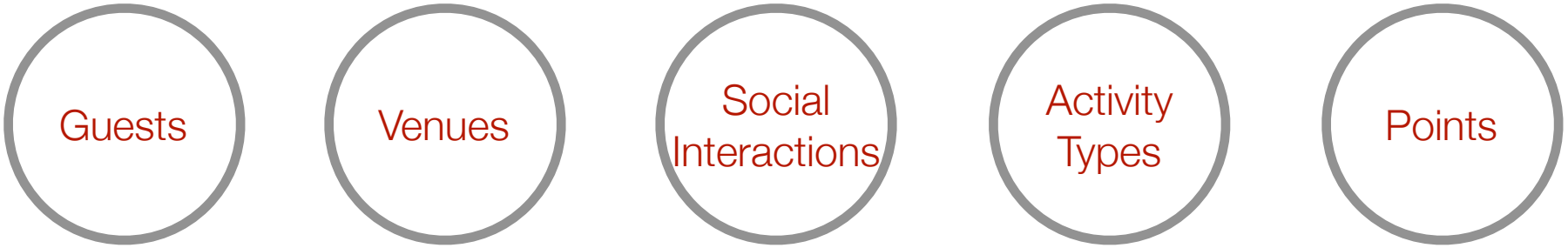
Information Architecture (e.g. Site Map)



Mapping journey and stories to information architecture to ensure the product functions and related content are fully captured.


Bridge
Guests
Venues
Activities
Activity Types
Points
SHARE
VIEWS
Grid view
5 hidden fields
Filter
Group
Sort
Color
Share view
Find a view
Guest ID
First N...
Last N...
Email ...
Date Join
Date of Bi...
Nationality
Resident ...
Membership Points
1
1111
David
Chan
dchan2000...
1/1/2021
23/2/2000
Hong Kong SAR
20.0
3 hidden fields
Name
MIT
Harvard University
Harvard Square
Activity Types
hidden fields
Points
Download App
20.0
Activate App
20.0
Join Table
20.0
Activity Typ...
Point...
Activity Name
1001
Share location
10.0
Visit Harvard campus
1002
Visit MIT Technology M
1003
Check in hotel.
AUTOMATIONS
Date
Guests
Guest...
Activity Code
Activity Name (fr...
Venues
Activity Point
1111-1001
1/2/2021
1111
David Chan
1001
Visit Harvard campus
Harvard University
10.0
Social Interactions
2 hidden fields
Guest Name
Guest ID
Friends Joining the ...
Ids of Friends
Link to Points
Activity
Peter Wong
1112
David Chan
1111
1111-1001
1111-1002
Visit Harvard campus, Visit MIT Technology ...

Data Entities to be Tracked



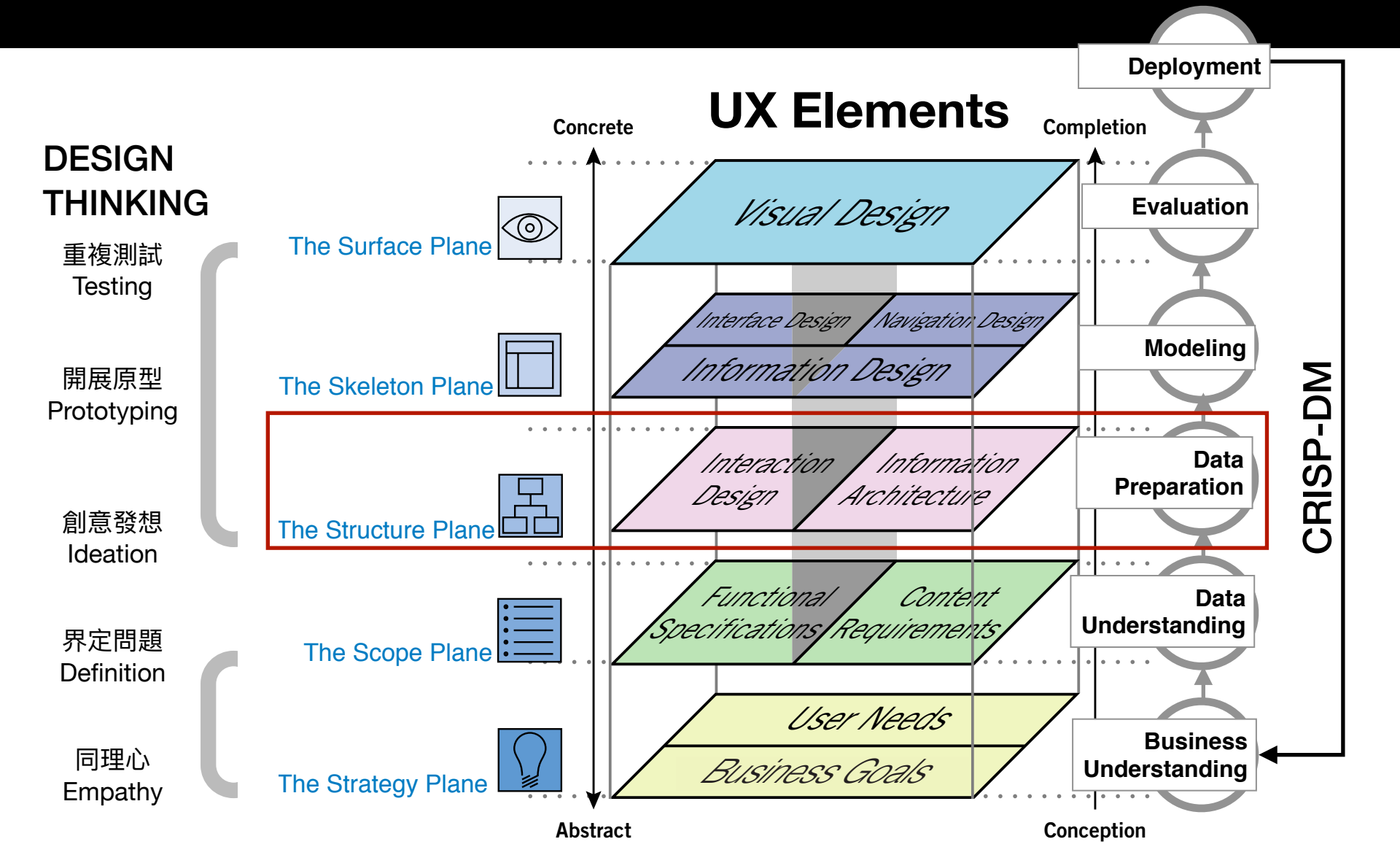
- e.g.
  -1st time guests
  -Returning guests

- 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


DESIGN THINKING
重複測試
Testing
開展原型
Prototyping
創意發想
Ideation
界定問題
Definition
同理心
Empathy
UX Elements
Concrete
Abstract
Completion
Conception
The Surface Plane
The Skeleton Plane
The Structure Plane
The Scope Plane
The Strategy Plane
Visual Design
Interface Design
Navigation Design
Information Design
Interaction Design
Information Architecture
Functional Specifications
Content Requirements
User Needs
Business Goals
Deployment
Evaluation
Modeling
Data Preparation
Data Understanding
Business Understanding
CRISP-DM

Develop Prototypes

Transformation of a hotel into a platform.

- Generate contents through user profiling and interests, destinations tracking, rating and reviews
- Build community stickiness by matching profiles and interests, rewarding ratings and reviews
- Increase membership by implementing a point system to build loyalty and reinforce recurring guest visits and spending

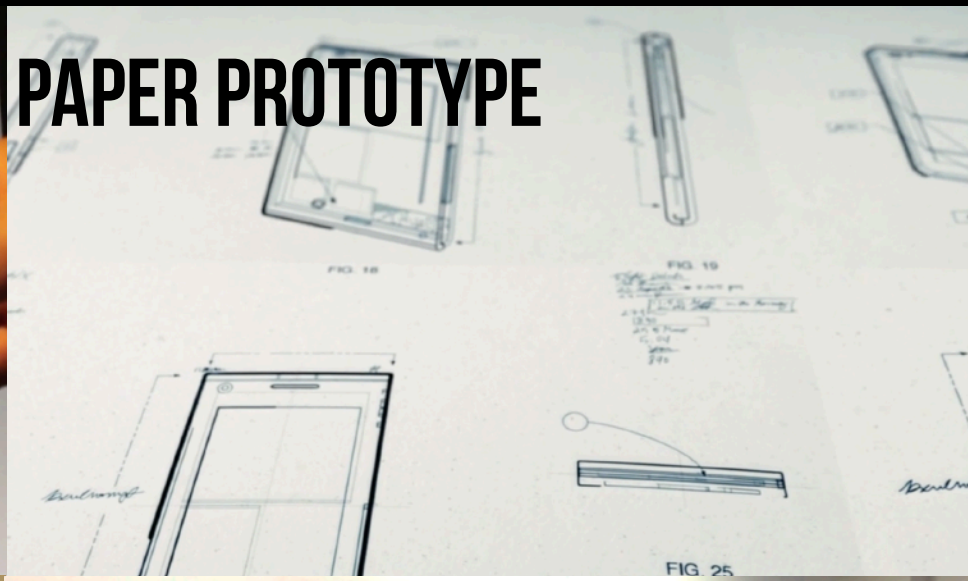
Hypothesis to be tested

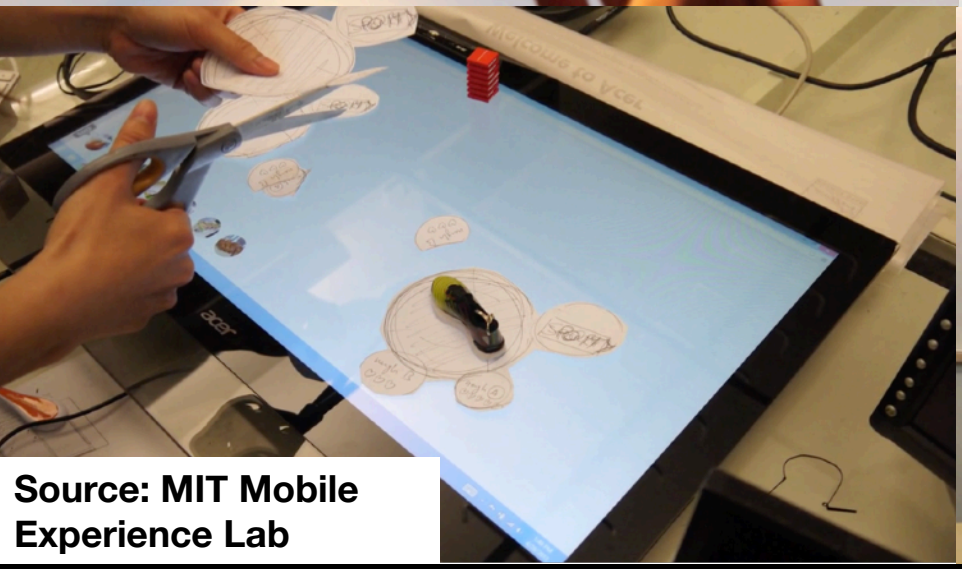
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓
- ✓

Assumptions to be tested

- ✓ Incentive for downloading the Mariott Social App
- ✓ Incentive for activating the app and providing personal profile
- ✓ Hidden switching costs
- ✓ Information reliability and privacy risk
- ✓ Incentive for accepting invitation and matching
- ✓ Risk in accepting invitation and matching
- ✓ Incentives and risk in sharing and commenting
- ✓ Reliability of recommendation system

SKETCH AND PAPER PROTOTYPE

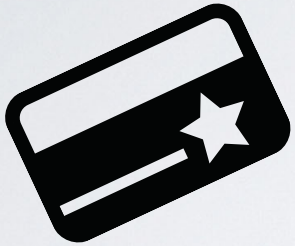




Source: MIT Mobile Experience Lab

Source: MIT Mobile Experience Lab

THE CARD



room key
point counter
status symbol

LOYALTY

THE TABLE

the social hub

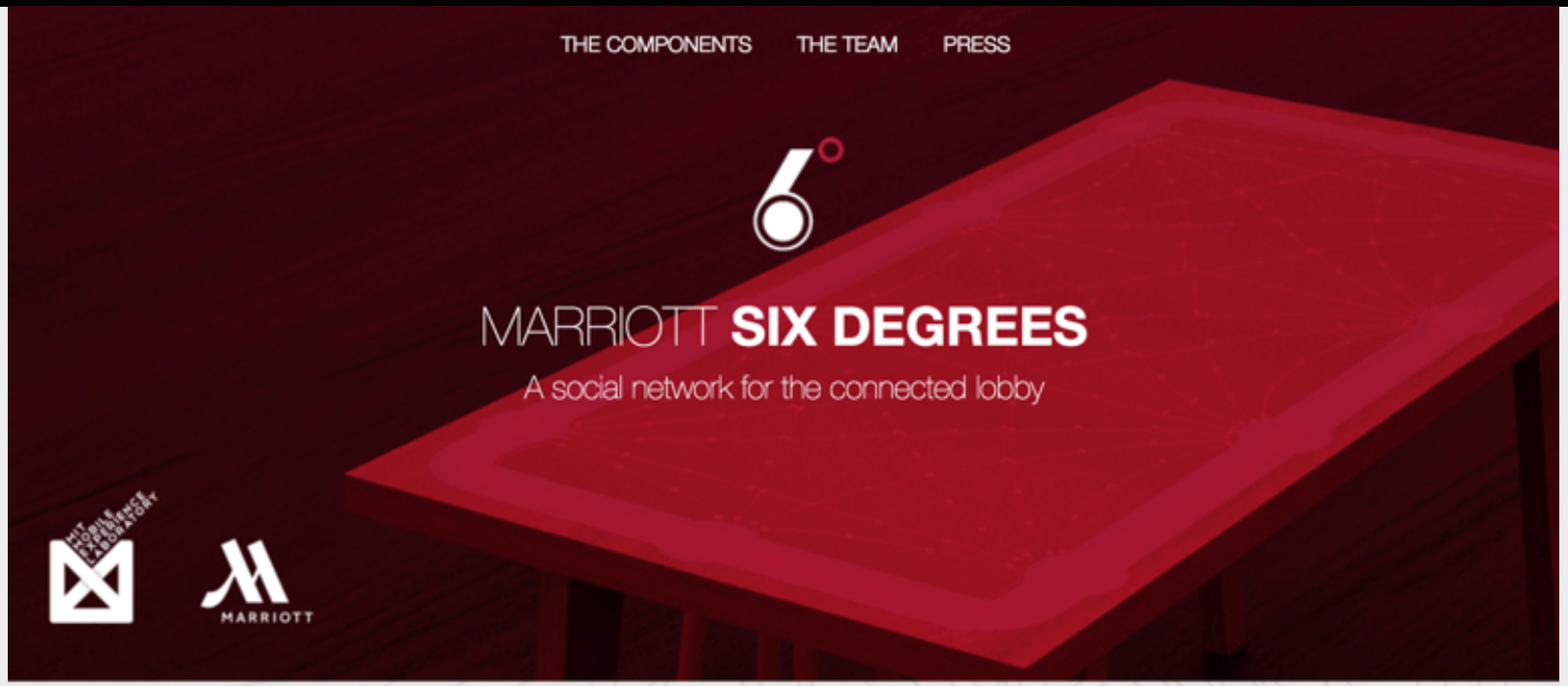
INTERACTION

THE APP

shared memory
social networks
recommendations

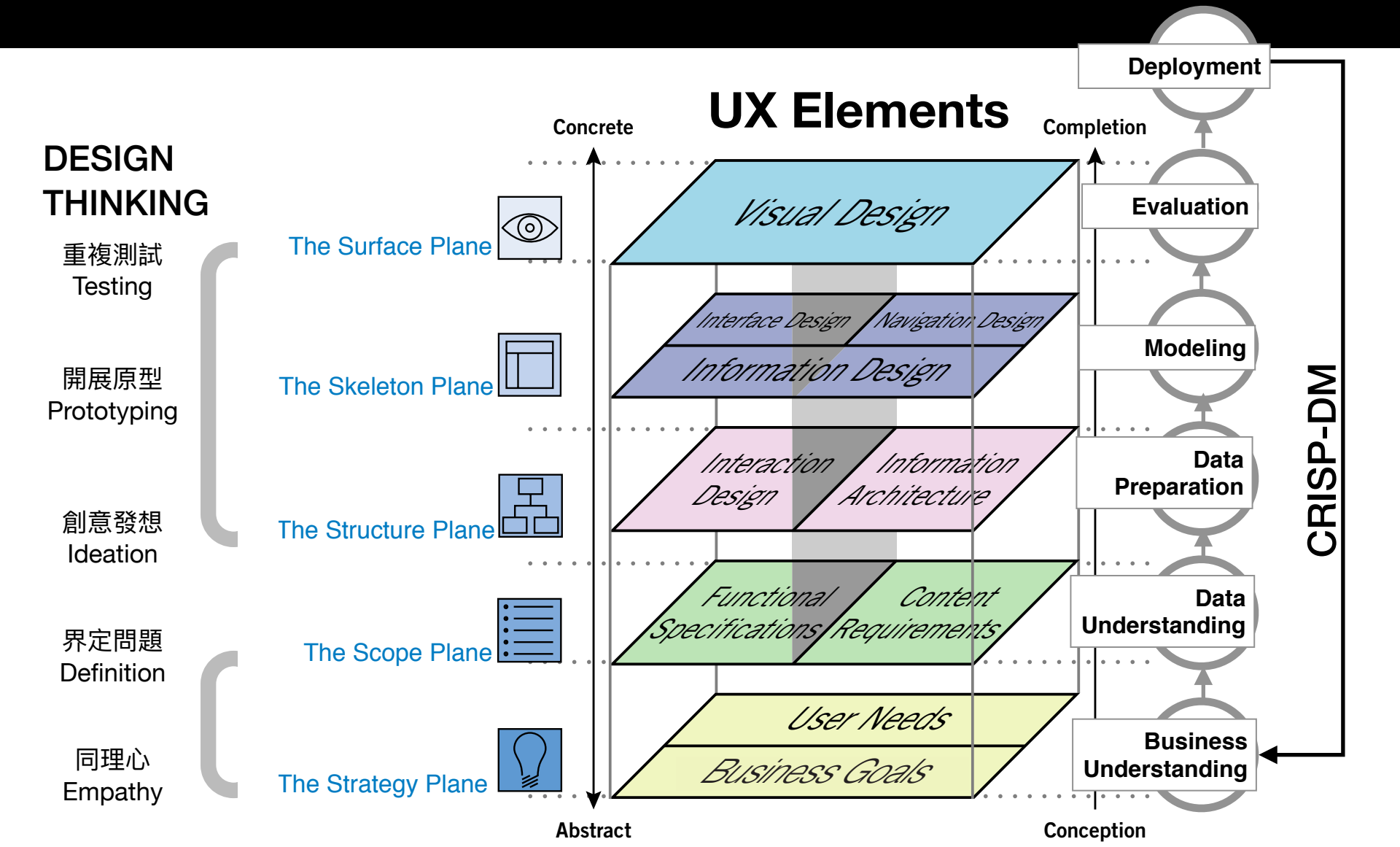
DATA

Source: MIT Mobile Experience Lab



Six Degrees is a prototype social network designed for the hotel lobby by the **MIT Mobile Experience Lab** in collaboration with **Marriott Hotels.**

Through Six Degrees, guests can discover how they are connected to one another, and can socialize with one another in events planned by Marriott. The platform is designed to highlight the connections that already exist between guests, while encouraging new connections to form.



Business Goals

設計思維 Design Thinking	數據發掘 Data Mining	用户體驗元素 Elements of UX	內容重點 Main Points
同理心 Empathy	商業理解 Business Understanding	戰畧層 Strategy Plane	Collect stories from stakeholders for framing and decomposing user and business problems into pain points and data points for meeting user needs and business goals.
界定問題 Definition	數據理解 Data Understanding	範圍層 Scope Plane	Define the scope and problem in terms of functional and content requirements for collecting data to support ongoing system development and future operations.
創意發想 Ideation	準備數據 Data Preparation	結構層 Structure Plane	Design classification schemes for grouping data attributes into data structures and information architectures for data aggregation and preparation.
開展原型 Prototyping	建立模型 Modeling	框架層 Skeleton Plane	Develop physical prototypes and software models/ applications for later testing and evaluation.
重複測試 Testing	評估 Evaluation	表現層 Visual Plane	Evaluate findings through qualitative and quantitative methods to validate visual outcome and interfaces.

Recommended Reading

1. Andreessen, Marc (2011) Why Software is Eating The World. The Wall Street Journal, August 20, 2011 (https://uptakedigital.zendesk.com/hc/en-us/articles/115001167933-Why-Software-Is-Eating-the-World).

2. Buytaert, Dries (2015) No, Data is Eating the World. Recode.net, Jan 7, 2015 (https://www.vox.com/2015/1/7/11557562/no-data-is-eating-the-world).

3. Davenport, Thomas H. and Patil D.J. (2012) Data Scientist: The Sexiest Job of the 21st Century. Harvard Business Review October 2012 Issue. (https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century)

4. Garrett. J. J. (2011) Chap. 2 The Elements of User Experience (http://www.jjg.net/elements/pdf/elements_ch02.pdf)

5. Minah, V., (2020) Data Science and Design Thinking Belong Together (https://www.frogdesign.com/designmind/data-science-and-design-thinking-belong-together)

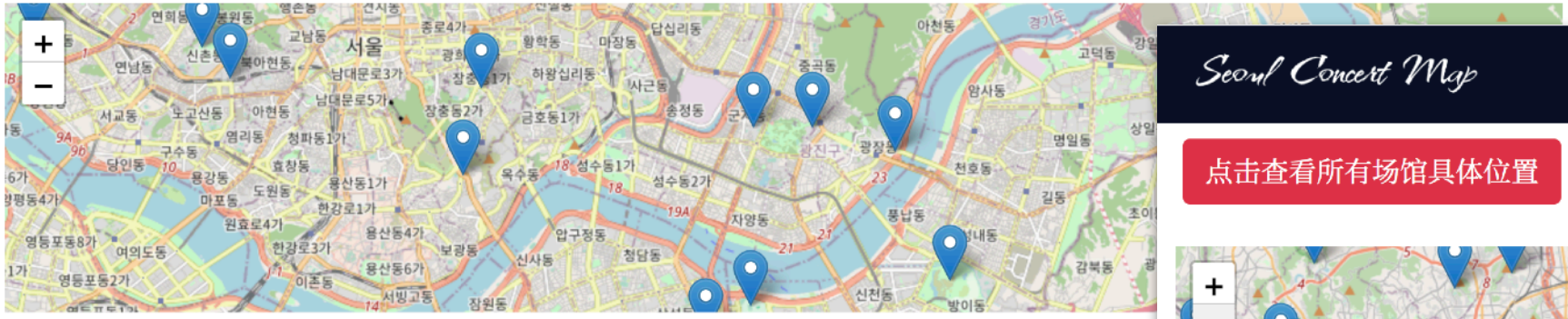
Student's Project as Example

Case Study: Seoul Concert Map

Seoul Concert Map

主页 演出信息 场馆信息 周围推荐 出行贴士 联系我们

点击查看所有场馆具体位置

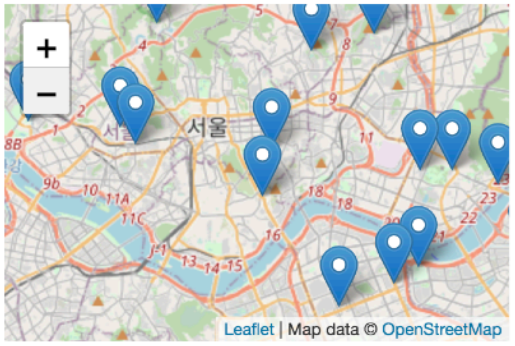


점击查看场馆最多容纳人数

500-1499 100-2999 3000-9999 10000以上

Seoul Concert Map

点击查看所有场馆具体位置



点击查看场馆最多容纳人数

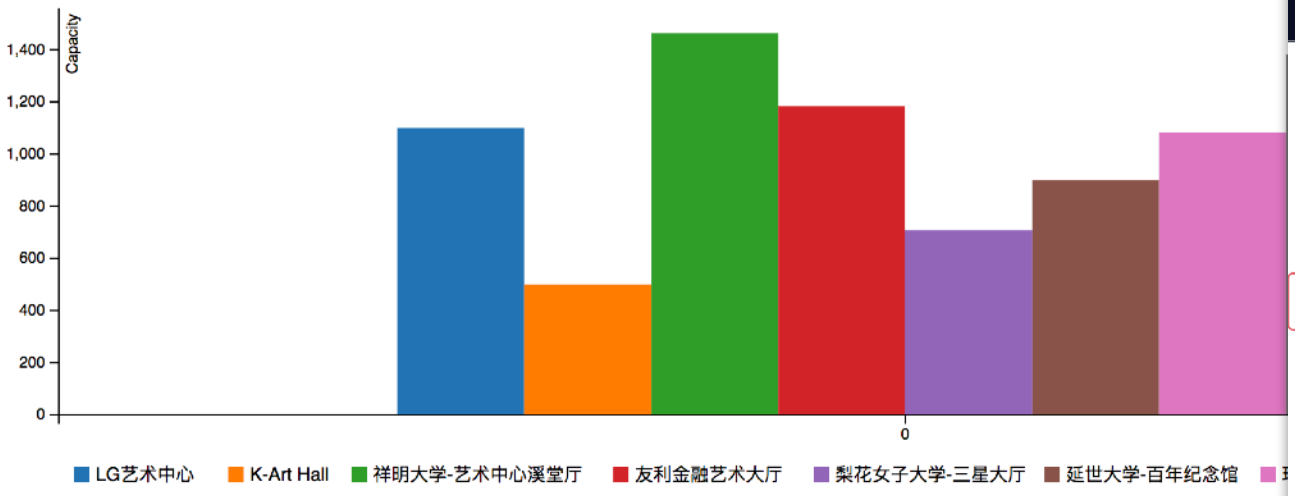
Seoul Concert Map

主页 演出信息 场馆信息 周围推荐 出行贴士 联系我们

Leaflet | Map data © OpenStreetMap

点击查看场馆最多容纳人数

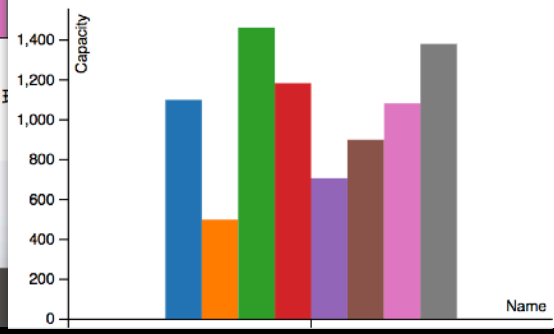
500-1499 100-2999 3000-9999 10000以上



Seoul Concert Map

点击查看场馆最多容纳人数

500-1499 100-2999 3000-9999 10000以上



Seoul Concert Map

主页 演出信息 场馆信息 **周围推荐** 出行贴士 联系我们

一键查看所有推荐去处的具体信息

Hide fields | Filter | Group | Sort | ...

	名称	类型	TripAdvisor...	行政区	地址	交通
1	梨花女子大学	文化场所	1115	西大门区	梨花女大街52	2号线梨大(Ewha Woman
2	庆熙大学	文化场所	123	东大门区	庆熙大路26	1号线回基(Hoegi)站1号出
3	高丽大学	文化场所	53	城北区	安岩路145	6号线安岩(Anam)站1/2号
4	景福宫	文化场所	10421	钟路区	社稷路161	3号线景福宫(Gyeongbok
5	北汉山国立公园	文化场所	1067	城北区	辅国门路262	4号线吉音(Gireum)站2号
6	韩国国立中央博物馆	文化场所	2303	龙山区	西冰库路137	4号线二村(Ichon)站2号出
7	三清阁	文化场所	112	城北区	大使馆路3	5号线光化门(Gwanghwa
8	北村韩屋村	文化场所	5138	钟路区	北村路11街...	3号线安国(Anguk)站
9	洪陵树木园	公园广场	21	东大门区	回基路57国...	6号线高丽大(Goryeodae
10	蠶岛汉江公园	公园广场	24	广津区	峨嵯山路200	2号线建大入口(Konkuk U
11	汝矣岛公园	公园广场	637	永登浦区	汝矣岛洞330	5号线汝矣渡口(Yeoui-na
12	奥林匹克公园	公园广场	695	松坡区	奥林匹克路...	5号线/9号线奥林匹克公园

Seoul Concert Map

	名称	类型
	梨花女子大学	文化场所
2	庆熙大学	文化场所
3	高丽大学	文化场所
4	景福宫	文化场所
5	北汉山国立公园	文化场所
6	韩国国立中央博物馆	文化场所
7	三清阁	文化场所
8	北村韩屋村	文化场所
9	洪陵树木园	公园广场
10	蠶岛汉江公园	公园广场

Introduction

“As a K-pop fan, from my personal experience, current information about Seoul concerts provided to Chinese K-pop fans is fragmented and unclear. There is no Chinese website or account that specifically summarizes and posts such information. Therefore, when people come up with the idea of going to Seoul to watch a concert, they have to spend a lot of time looking around for information from enormous websites, such as venue’s specific location, transportation, ticketing, accommodation, etc. More importantly, until the end, they may not be able to obtain correct and comprehensive information, affecting trips plan.

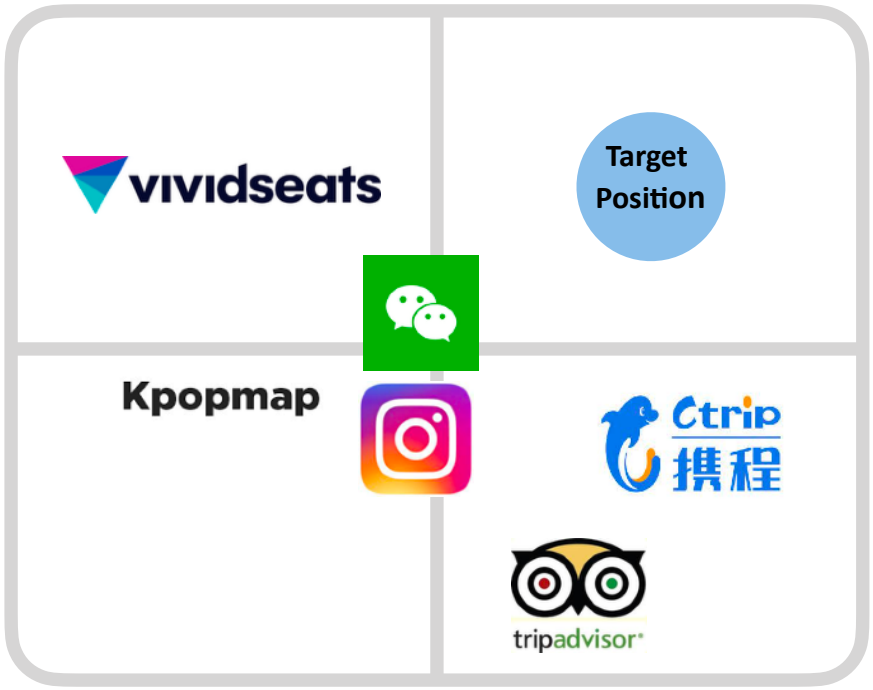
Thus, I want to build a website based on concert venues, providing all valid information of related aspects that people need for their concert journey to Seoul. Main purpose for this website is to help people better plan and arrange their trips, first finding venue conveniently and enjoy concert itself, then having a great time in Seoul.”

Interview Questions:

1. Which websites or information sources will you rely on to obtain concert related information?
2. What do you think this website/app is about when you first see the first screen?
3. Can you show me what you'll click to check information on (see following) from this website or information source?
4. How do you find out one specific concert's information about ticketing?
5. How do you know if you need to bring rain gear on the concert day?
6. How do you choose your accommodation?
7. How do you choose where to go on the concert day?
8. Is the navigation bar clear enough?
9. Is the function of each part clear enough?
10. What part could be improved and how?
11. What content should be added?
12. Is this website helpful if you are going to watch a concert in Seoul?

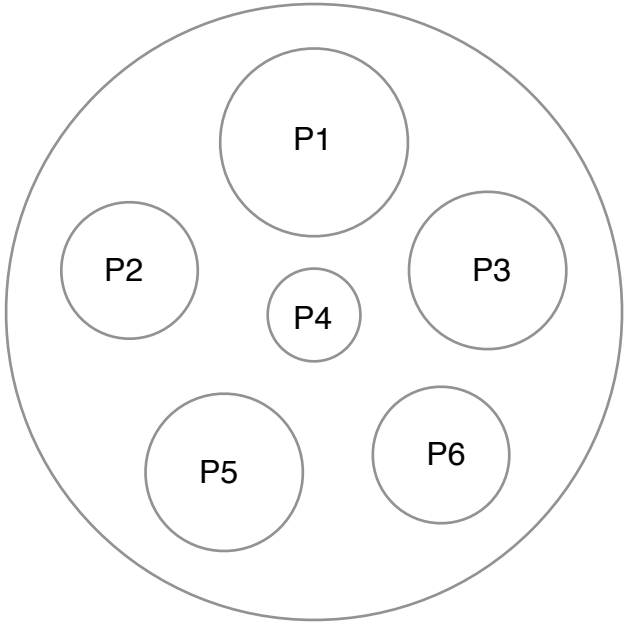
Current Alternatives

Positioning Map



User and Data Research

People who have the need to plan a trip to Korea to attend the concerts of K-Pop idols



P1 To P6 (Persona Types)
e.g. student K-Pop fan,
fan circle lead, trend reporter

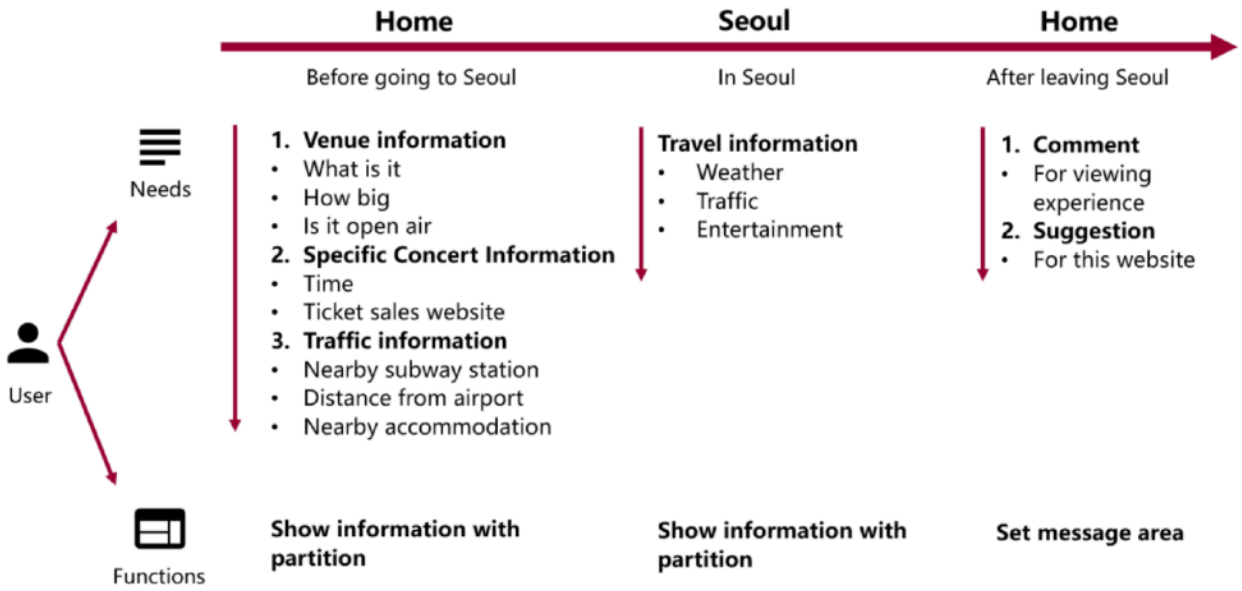
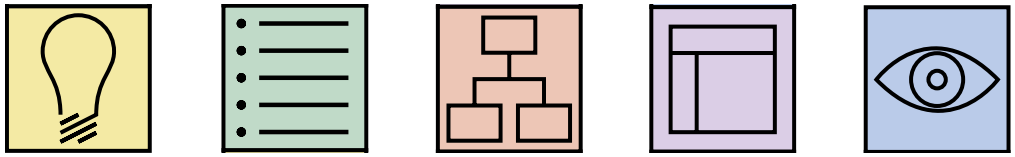


Figure 1. User Journey Map



SCOPE PLANE

Scope - Function and Content Requirements

According to user journey map, this website will mainly provide information needed in the first two phases: before and during the trip.

Venues information for route planning:

- Venues: all venues in Seoul that have a capacity of more than 500 people and have ever held concerts.
- Venues information: outfield and infield appearance, capacity, district, specific location, nearby subway station, directions and time required from Incheon Airport, recommended accommodation area, examples of previous concerts or plans of upcoming concerts.
- Visualization: map view showing specific locations of all venues, bar chart view comparing venue capacity by categories.

Upcoming concerts information for scheduling and booking:

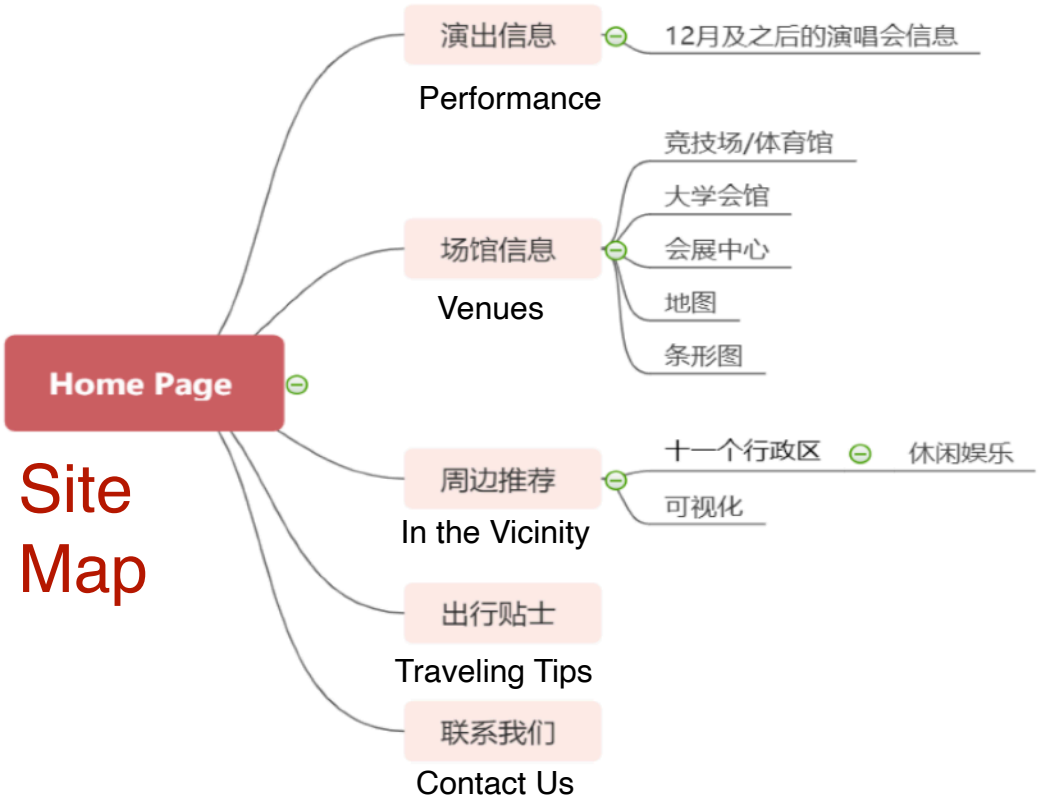
- Date, performer, concert name, ticket price and website, corresponding venue.

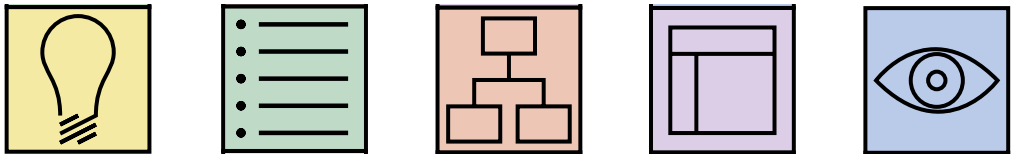
Nearby entertainment information for pre-concert and post-concert activities:

- Distinct, specific location, nearby subway station, corresponding venue, directions and time required from venue, introduction, TripAdvisor comments, opening hours, suggested tour time.
- Additionally, there is also a “Contact Us” section to collect user suggestions and feedback.

Bridging the front-end (view) and the backend (model) with information architecture (controller).

Site Map





STRUCTURE PLANE

Database Schema (Entity Relationship Diagram) for Enabling the Information Architecture

ERD (Entity Relationship Diagram)

Data Research (Data Understanding, Data Preparation and Data Modelling)

Seoul Concert Map

HELP

SEO keywords | ParseHub&OpenRefine-performances | Location | Picture | SHARE | AUTOMATIONS | APPS

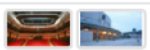
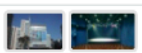
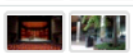
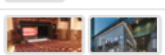
VIEWS | Grid view | Hide fields | Filter | Group | Sort | Color | Share view

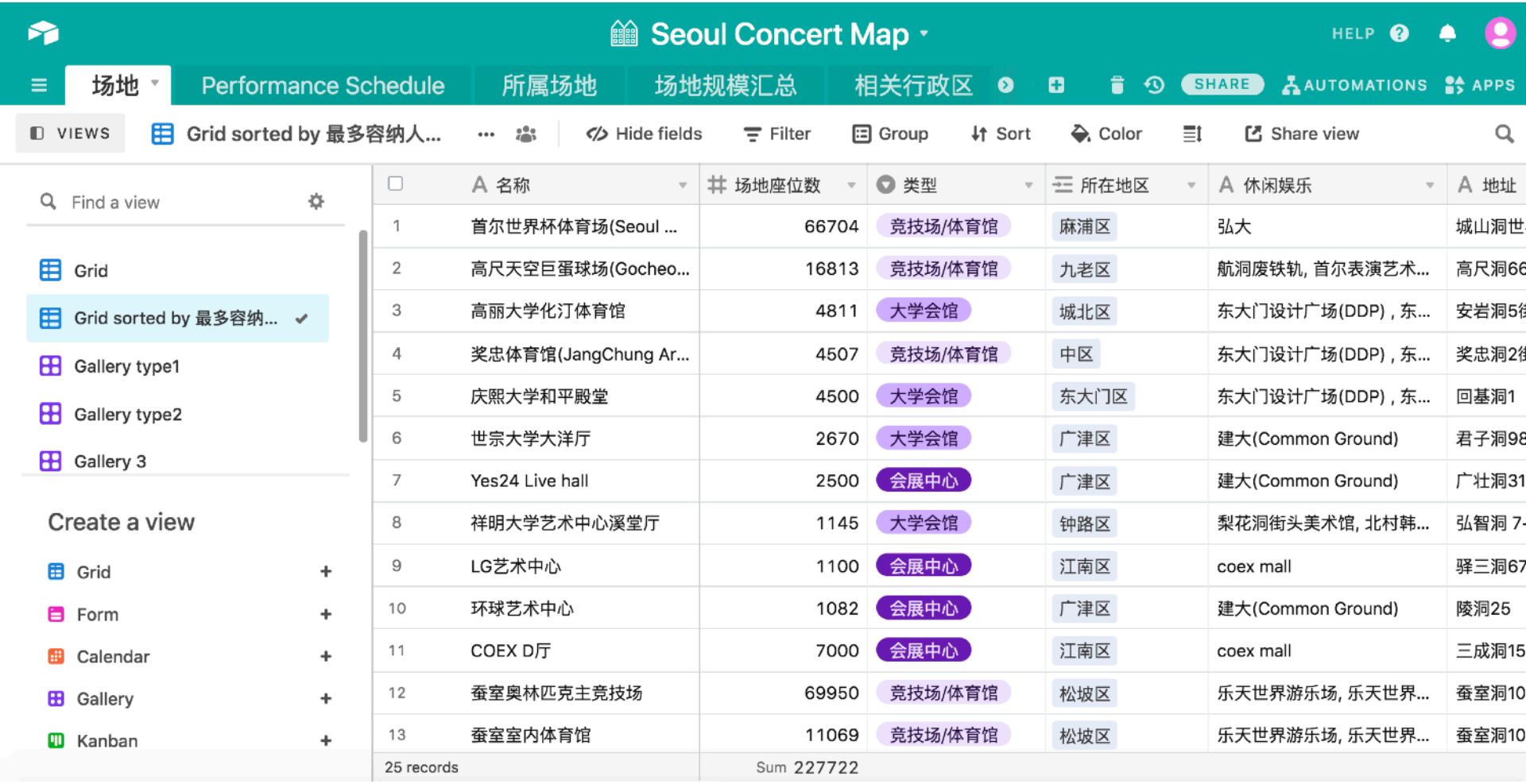
Find a view

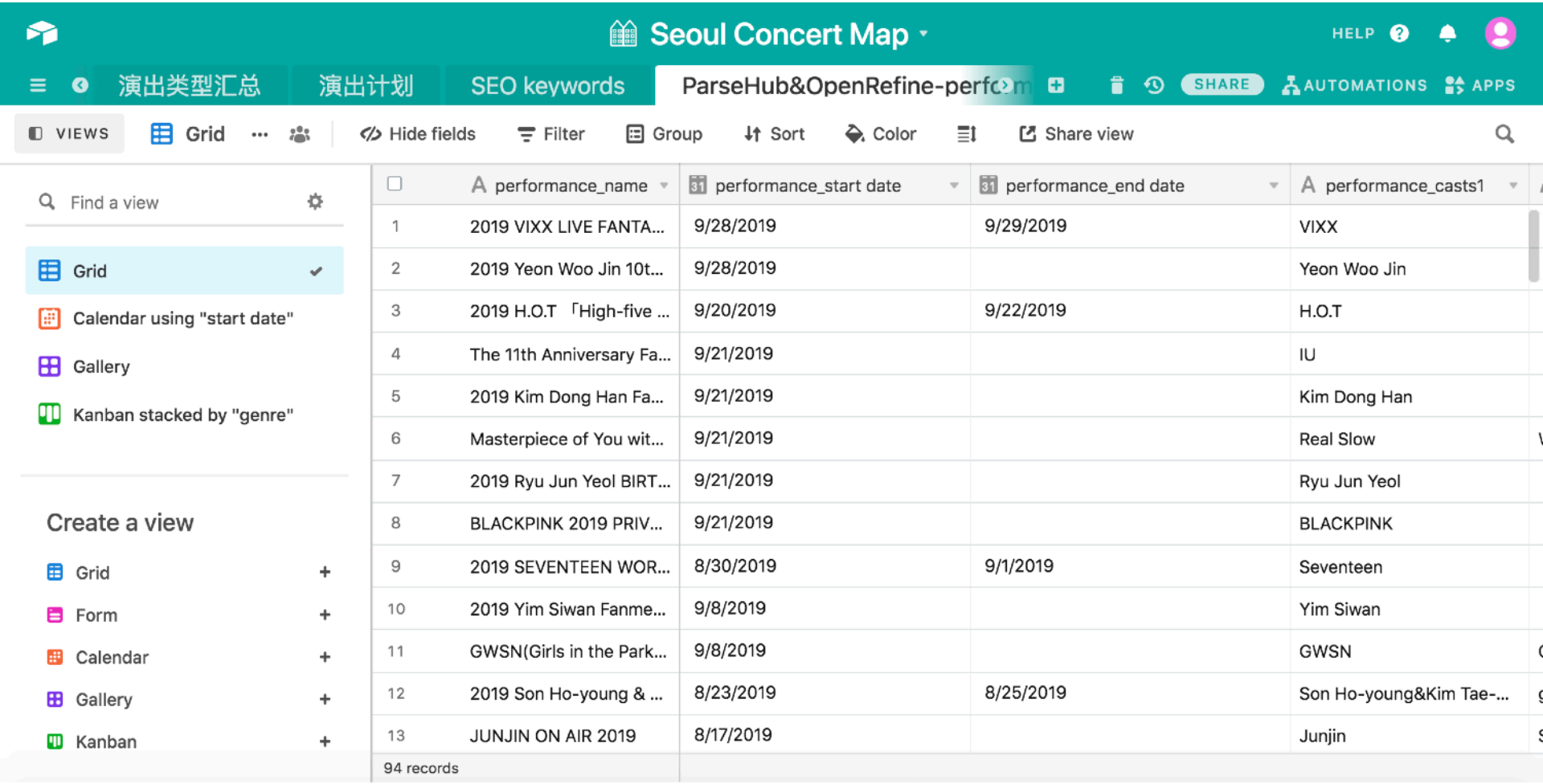
Grid view

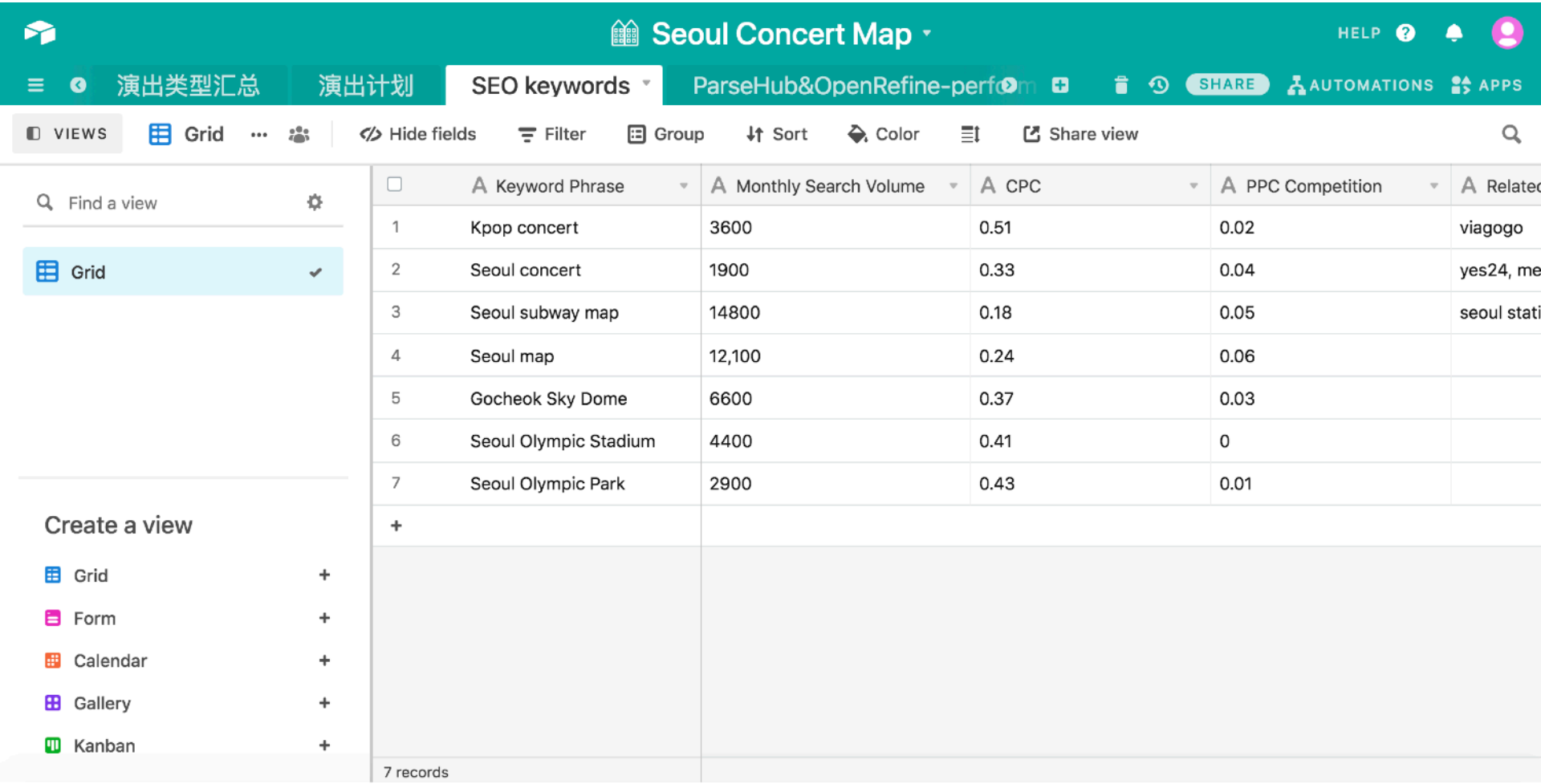
Create a view

- Grid
- Form
- Calendar
- Gallery
- Kanban

	Name	at	Lng	images	img_url
1	首尔世界杯体育场(Seoul ...	37.568222	126.897361		https://dl.airtable.co
2	高尺天空巨蛋球场(Gocheo...	37.498222	126.867250		https://dl.airtable.co
3	奖忠体育馆(JangChung Ar...	37.558056	127.006667		https://dl.airtable.co
4	高丽大学化汀体育馆	37.592916	127.024666		https://dl.airtable.co
5	庆熙大学和平殿堂	37.598943	127.052638		https://dl.airtable.co
6	世宗大学大洋厅	37.550540	127.073203		https://dl.airtable.co
7	祥明大学艺术中心溪堂厅	37.602782	126.955198		https://dl.airtable.co
8	Yes24 Live hall	37.545816	127.108096		https://dl.airtable.co
9	忠武艺术中心大剧场	37.566280	127.014589		https://dl.airtable.co
10	LG艺术中心	37.502166	127.037181		https://dl.airtable.co
11	环球艺术中心	37.550535	127.087630		https://dl.airtable.co
12	COEX Artium Theater	37.510421	127.061536		https://dl.airtable.co
13	纳鲁艺术中心(Naru Arts C...	37.537600	127.070525		https://dl.airtable.co
19 records		Sum 713.447114	Sum 2413.315071		


Seoul Concert Map
HELP
场地
Performance Schedule
所属场地
场地规模汇总
相关行政区
SHARE
AUTOMATIONS
APPS
VIEWS
Grid sorted by 最多容纳人...
Hide fields
Filter
Group
Sort
Color
Share view
Find a view
Grid
Grid sorted by 最多容纳...
Gallery type1
Gallery type2
Gallery 3
Create a view
Grid
Form
Calendar
Gallery
Kanban
名称
场地座位数
类型
所在地区
休闲娱乐
地址
1 首尔世界杯体育场(Seoul ... 66704 竞技场/体育馆 麻浦区 弘大 城山洞世
2 高尺天空巨蛋球场(Gocheo... 16813 竞技场/体育馆 九老区 航洞废铁轨, 首尔表演艺术... 高尺洞66
3 高丽大学化汀体育馆 4811 大学会馆 城北区 东大门设计广场(DDP)，东... 安岩洞5街
4 奖忠体育馆(JangChung Ar... 4507 竞技场/体育馆 中区 东大门设计广场(DDP)，东... 奖忠洞2街
5 庆熙大学和平殿堂 4500 大学会馆 东大门区 东大门设计广场(DDP)，东... 回基洞1
6 世宗大学大洋厅 2670 大学会馆 广津区 建大(Common Ground) 君子洞98
7 Yes24 Live hall 2500 会展中心 广津区 建大(Common Ground) 广壮洞31
8 祥明大学艺术中心溪堂厅 1145 大学会馆 钟路区 梨花洞街头美术馆, 北村韩... 弘智洞 7-
9 LG艺术中心 1100 会展中心 江南区 coex mall 驿三洞67
10 环球艺术中心 1082 会展中心 广津区 建大(Common Ground) 陵洞25
11 COEX D厅 7000 会展中心 江南区 coex mall 三成洞15
12 蚕室奥林匹克主竞技场 69950 竞技场/体育馆 松坡区 乐天世界游乐场, 乐天世界... 蚕室洞10
13 蚕室室内体育馆 11069 竞技场/体育馆 松坡区 乐天世界游乐场, 乐天世界... 蚕室洞10
25 records
Sum 227722


Seoul Concert Map
HELP
演出类型汇总
演出计划
SEO keywords
ParseHub&OpenRefine-perfo
SHARE
AUTOMATIONS
APPS
VIEWS
Grid
Hide fields
Filter
Group
Sort
Color
Share view
Find a view
Grid
Calendar using "start date"
Gallery
Kanban stacked by "genre"
Create a view
Grid
Form
Calendar
Gallery
Kanban
performance_name
performance_start date
performance_end date
performance_casts1
1 2019 VIXX LIVE FANTA... 9/28/2019 9/29/2019 VIXX
2 2019 Yeon Woo Jin 10t... 9/28/2019 Yeon Woo Jin
3 2019 H.O.T 「High-five ... 9/20/2019 9/22/2019 H.O.T
4 The 11th Anniversary Fa... 9/21/2019 IU
5 2019 Kim Dong Han Fa... 9/21/2019 Kim Dong Han
6 Masterpiece of You wit... 9/21/2019 Real Slow
7 2019 Ryu Jun Yeol BIRT... 9/21/2019 Ryu Jun Yeol
8 BLACKPINK 2019 PRIV... 9/21/2019 BLACKPINK
9 2019 SEVENTEEN WOR... 8/30/2019 9/1/2019 Seventeen
10 2019 Yim Siwan Fanme... 9/8/2019 Yim Siwan
11 GWSN(Girls in the Park... 9/8/2019 GWSN
12 2019 Son Ho-young & ... 8/23/2019 8/25/2019 Son Ho-young&Kim Tae-...
13 JUNJIN ON AIR 2019 8/17/2019 Junjin
94 records

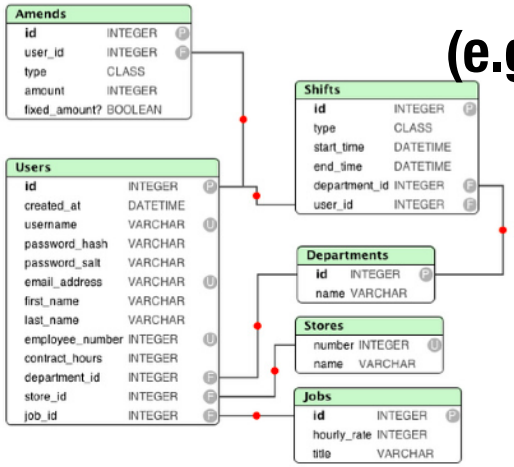

Seoul Concert Map
HELP
演出类型汇总
演出计划
SEO keywords
ParseHub&OpenRefine-perfo
SHARE
AUTOMATIONS
APPS
VIEWS
Grid
Hide fields
Filter
Group
Sort
Color
Share view
Find a view
Grid
Create a view
Grid
Form
Calendar
Gallery
Kanban
Keyword Phrase
Monthly Search Volume
CPC
PPC Competition
Relate
1 Kpop concert 3600 0.51 0.02 viagogo
2 Seoul concert 1900 0.33 0.04 yes24, me
3 Seoul subway map 14800 0.18 0.05 seoul stati
4 Seoul map 12,100 0.24 0.06
5 Gocheok Sky Dome 6600 0.37 0.03
6 Seoul Olympic Stadium 4400 0.41 0
7 Seoul Olympic Park 2900 0.43 0.01
7 records

Source: commons.wikimedia.org

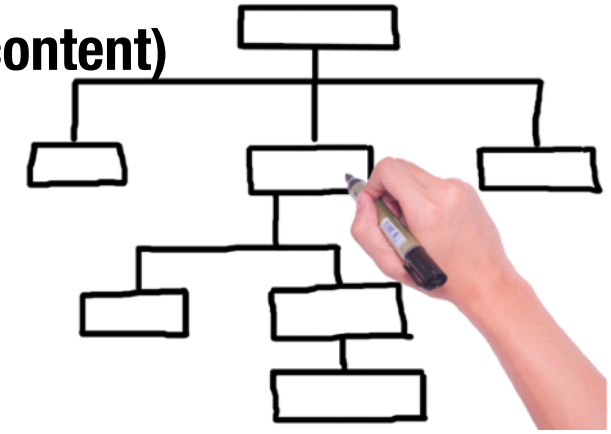
Source: Caius Durling (Flickr)

Source: pexels.com

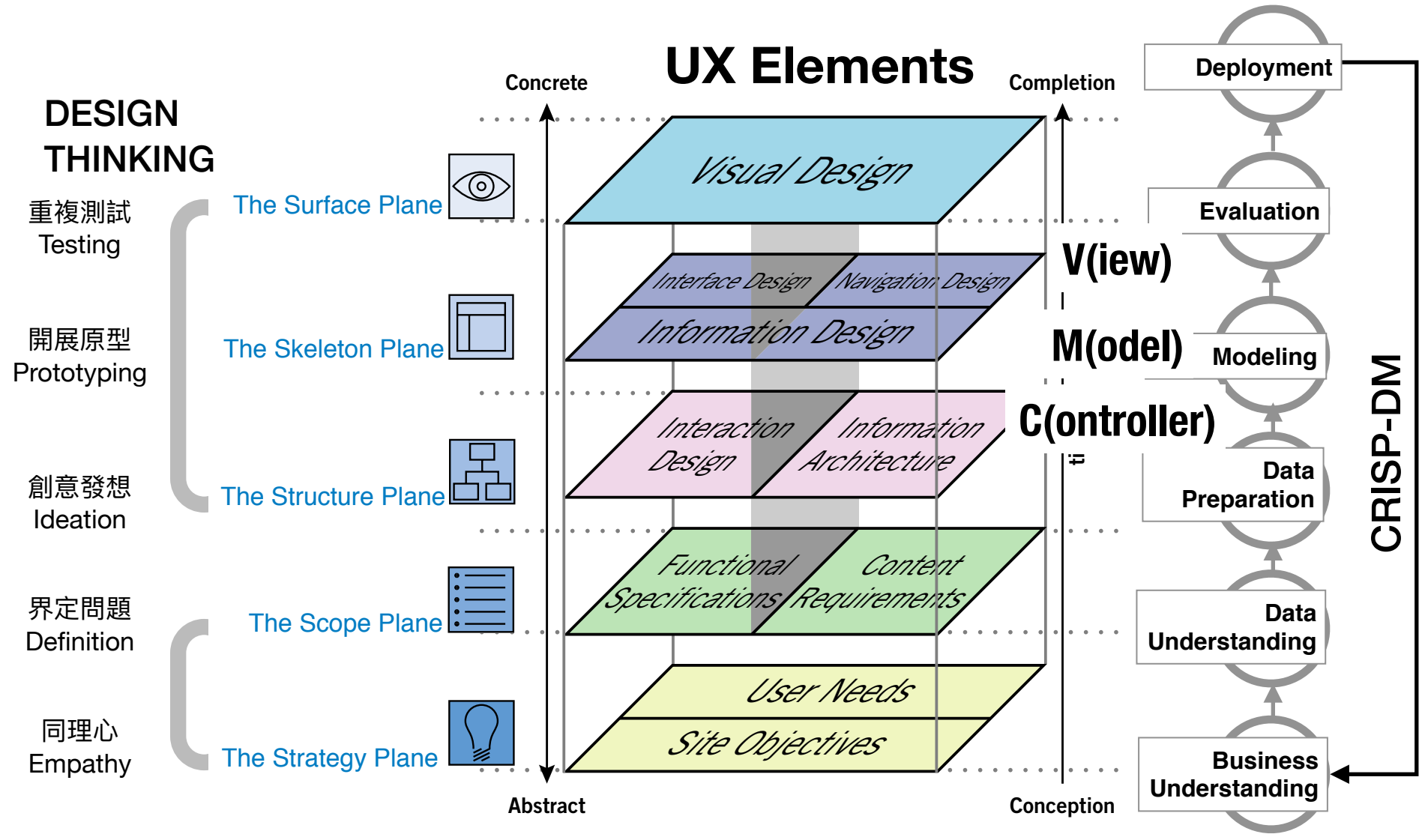
V(iew)
(e.g. user interface, media content)



M(odel)
(e.g. database/tables, relations, and queries)



C(ontroller)
(e.g. sitemap, navigation, routes)


DESIGN THINKING
重複測試 Testing
開展原型 Prototyping
創意發想 Ideation
界定問題 Definition
同理心 Empathy
The Surface Plane
The Skeleton Plane
The Structure Plane
The Scope Plane
The Strategy Plane
UX Elements
Concrete
Abstract
Completion
Conception
Visual Design
Interface Design
Navigation Design
Information Design
Interaction Design
Information Architecture
Functional Specifications
Content Requirements
User Needs
Site Objectives
V(iew)
M(odel)
C(ontroller)
Deployment
Evaluation
Modeling
Data Preparation
Data Understanding
Business Understanding
CRISP-DM

source: https://www.woshipm.com/pmd/3319375.html

source:https://www.woshipm.com/evaluating/4533914.html

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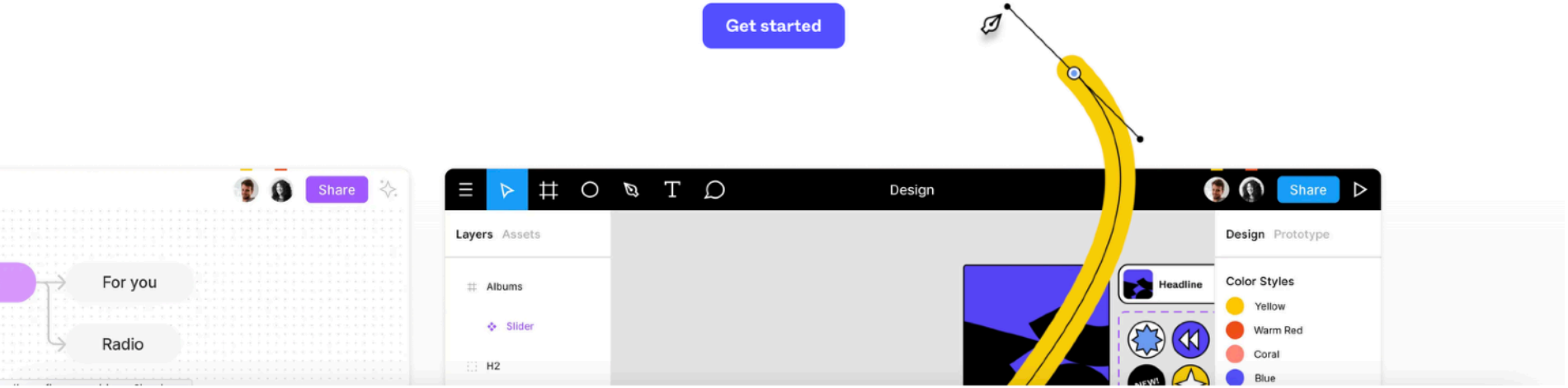

Thank you for your time!