

# eleven - supercase challenge

To the attention of the Data Science  
& Business Analytics students

February 13th, 2023



## Your preferential interlocutors today



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# AGENDA



1. About eleven
2. Case presentations
  - a) The Right Price
  - b) Mind Market Operation
3. General information

eleven is Europe's first ever specialist strategy firm specifically founded to accompany clients' transformation through the AI and digital revolution, thanks to a unique combination of strategy perspective and hands-on approach

## DIGITAL & AI STRATEGY SPECIALIST

*revolution is unlocking new, untapped value creation opportunities*

## STRATEGY X HANDS-ON POSITIONING

*supporting C-level executives and organizations from strategic ignition to project scale-up and*

## A UNIQUE BLEND OF SKILLS

*and data science ones, thanks to its 50+ consultants that master the continuously evolving*

## DISTINCTIVE ENTREPRENEURIAL MINDSET

*us to provide issue-based methodologies centered on your business needs*

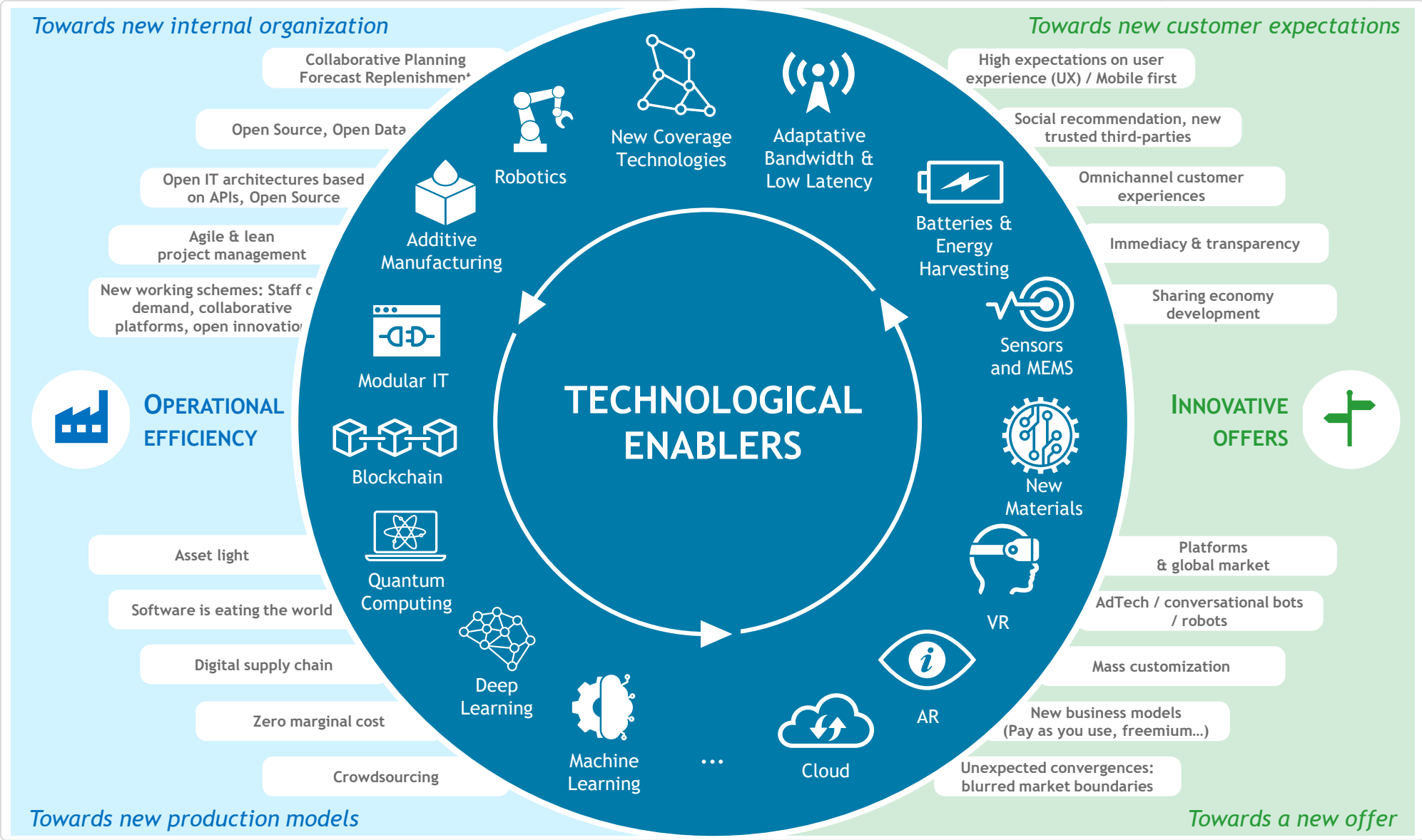
## CSR AT THE CORE OF OUR DNA

*Our approach enables our clients' projects to meet CSR expectations. Both financial and CSR impacts are tracked, proven and reported thanks to our mastering of digital and AI levers*

**eleven**  
strategy • data • digital

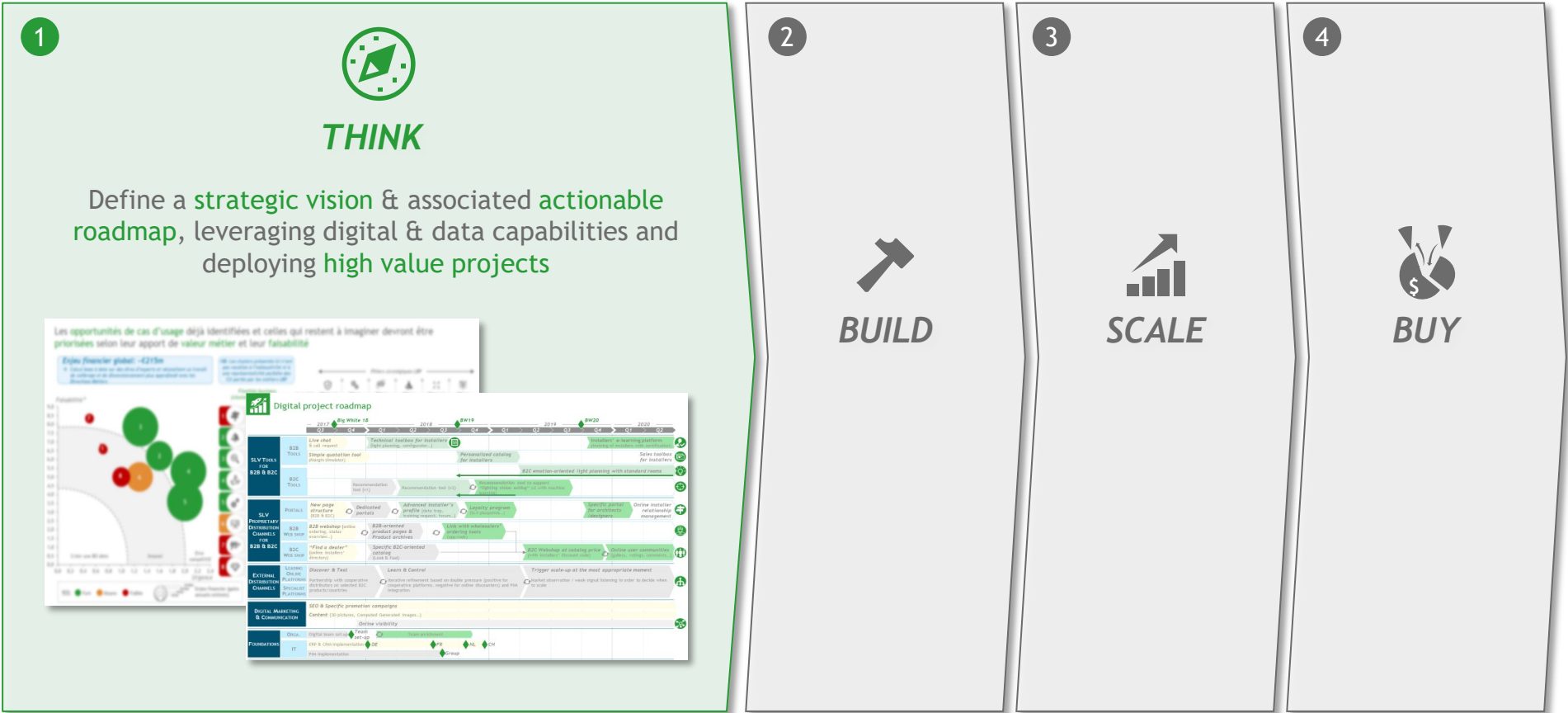
Our projects are built around ongoing major digital & data disruptions, including **new modes of production, consumption and collaboration**, which represent major challenges for existing players

*eleven's 'plate tectonics' of disruptions*



eleven's positioning encompasses an **end-to-end spectrum** enabling to secure the fastest route **from strategy to industrialization**, allowing to identify and accelerate most valuable digital x data initiatives

ELEVEN'S END-TO-END POSITIONING

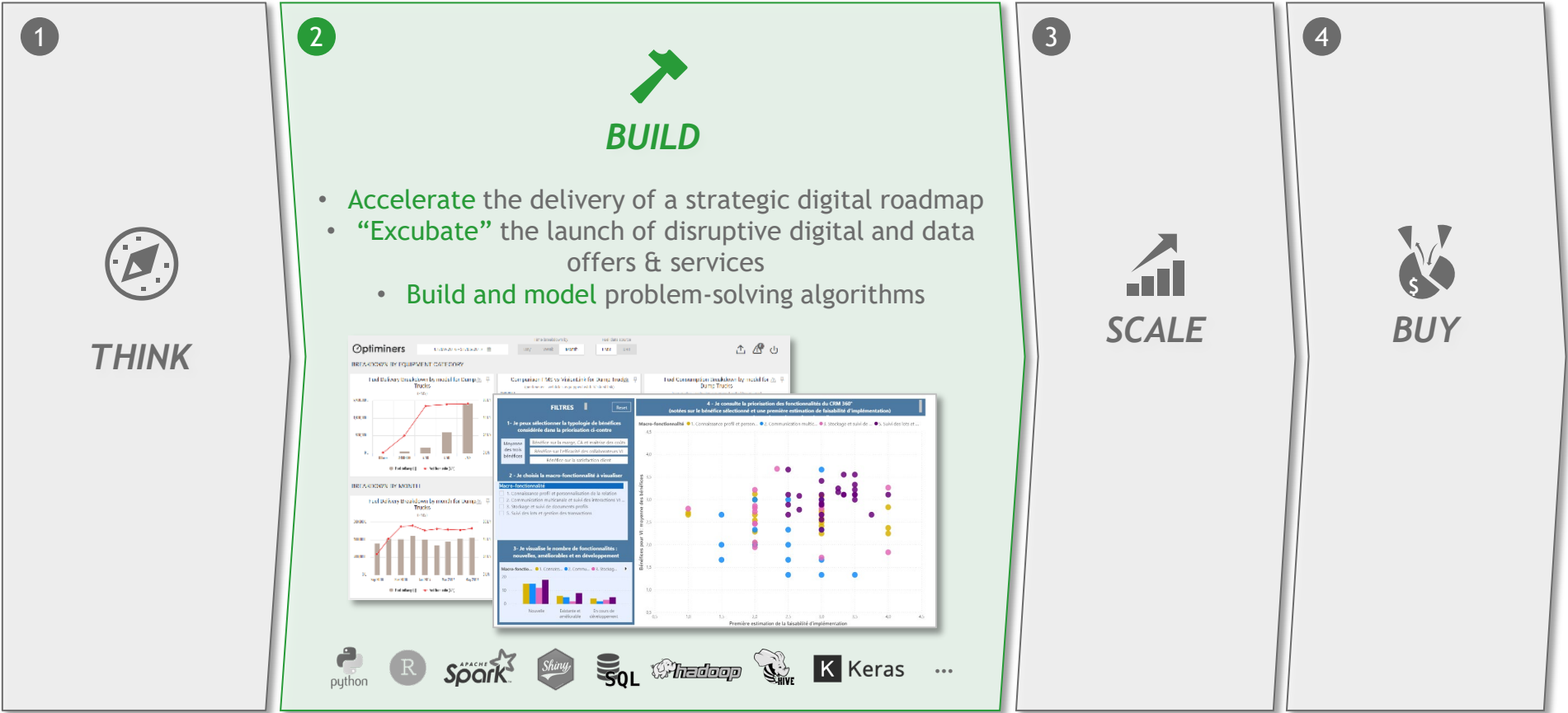


Continuous interactions with client's c-levels, business units and digital & data teams

Proven ability to lead projects and teams **remotely** thanks to the most **advanced digital tools**

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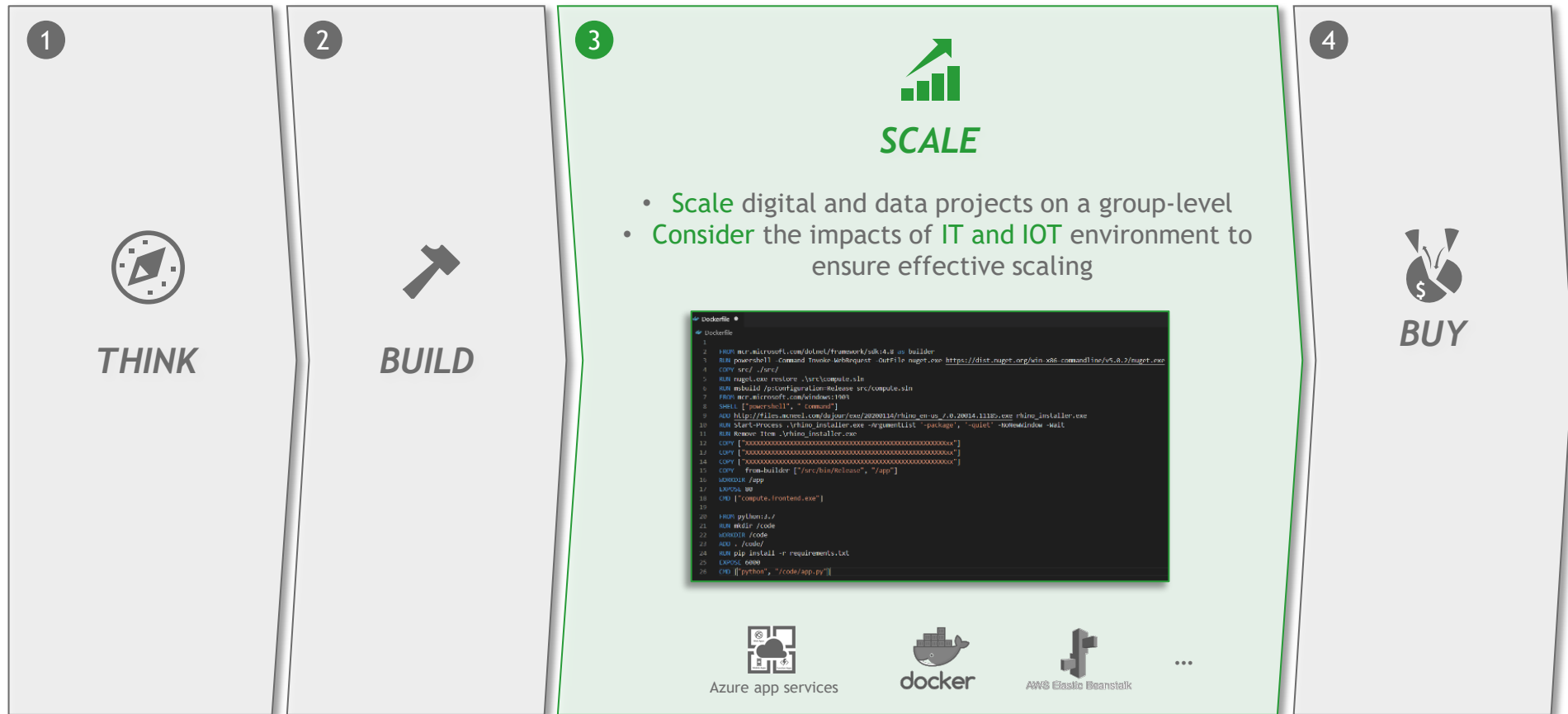


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## ELEVEN'S END-TO-END POSITIONING



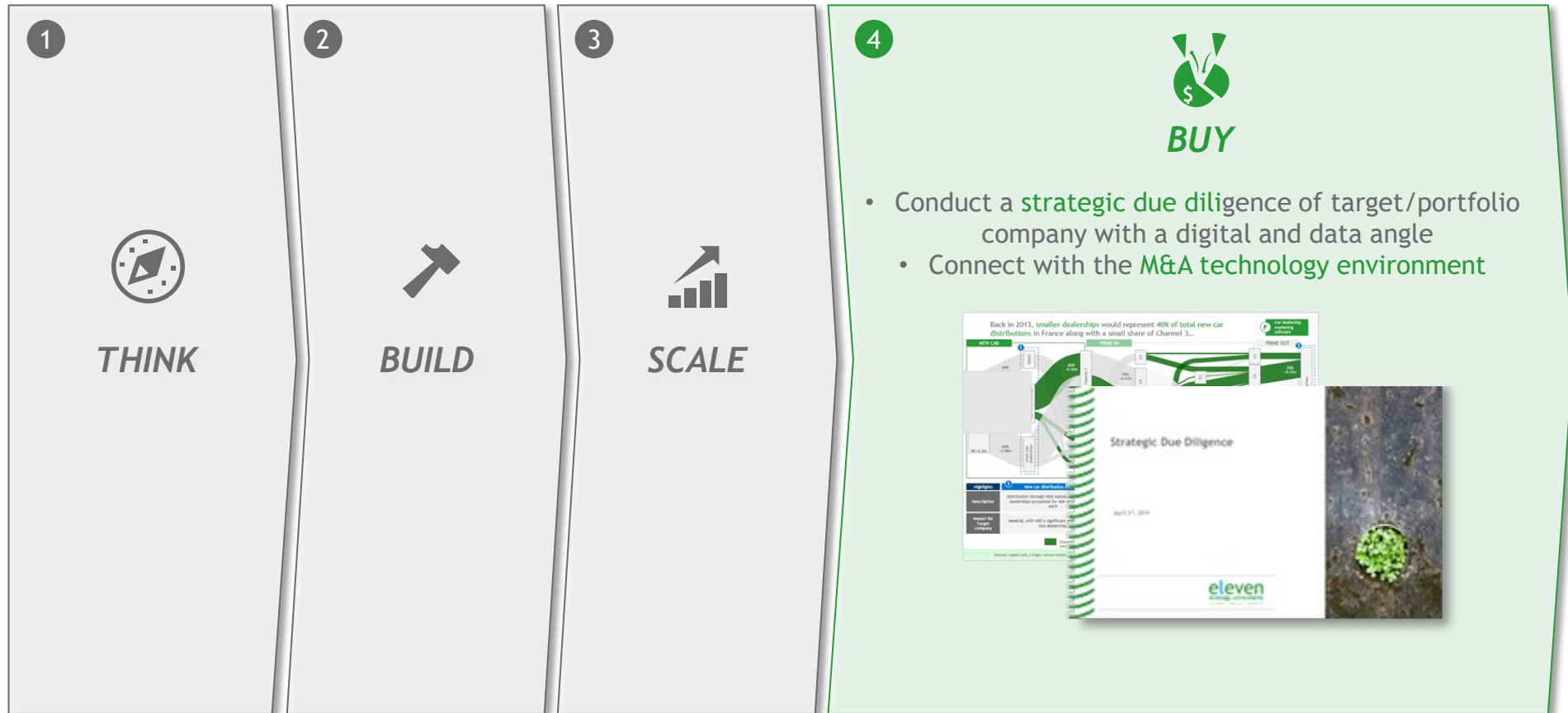
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#### ELEVEN'S END-TO-END POSITIONING



Continuous interactions with client's c-levels, business units and digital & data teams

Proven ability to lead projects and teams **remotely** thanks to the most **advanced digital tools**

eleven serves top large cap clients and leading mid cap players across several key industries as well as leading International large cap and smid cap Private Equity funds

ELEVEN'S KEY REFERENCES

CORPORATE

Large corporates



PRIVATE EQUITY

Large cap



Mid Cap players



SMid cap



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# eleven supercase challenge: work on real-life challenges coming from various industries leveraging your dual expertise in business and data science



## Exercise:

- ✓ Gather with your group of 5/6 people
- ✓ Find out what is the topic of your group among the 2 available
- ✓ On your topic, put yourself in a data consultant's shoes:
  - ✓ What is the context of the company? (value chain, competition, technological trends, etc.)
  - ✓ How could you generate added-value for them using potential of new technological enablers? (time-series, NLP, computer vision, etc.)
  - ✓ What should be the best way to present your first results? (data visualization, 1<sup>st</sup> demo, etc.)
  - ✓ How much should we trust your first results? (accuracy of your model, etc.)
  - ✓ What would be the next steps if you wanted to keep improving your results? (fine tuning, new model, advanced feature engineering, etc.)
- ✓ Synthesize your work in a few slides (up to 15 slides)
- ✓ Upload your work on the Sharepoint (presentation, code, etc: see details at the end of this presentation)
- ✓ Present to the jury and prepare for questions



### The Right Price

How to estimate a property price?



### Mind Market Operation

How to strategize based on customer consumption behaviors ?



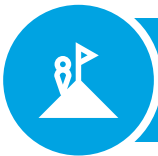
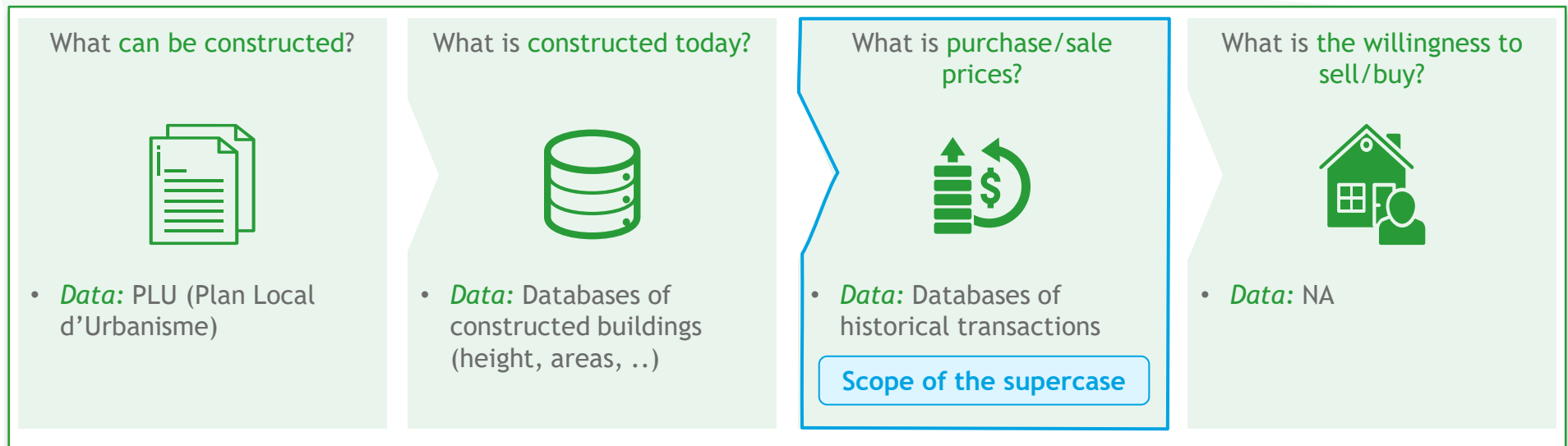
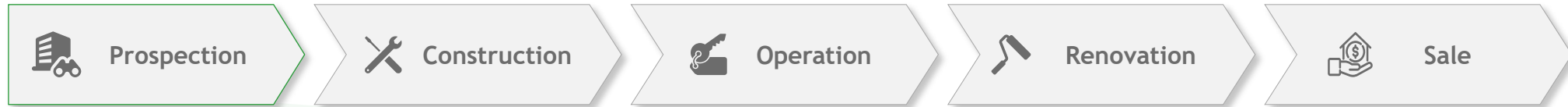
# The Right Price

*improving definition and computation of  
mutability score in Île-de-France*

**Context:** the client, a player in real-estate industry, **wants to build a robust purchase/sale price estimation model**

Value chain of a real estate development project

For illustration purposes



Your missions

- Process the data from historical transactions to **get geolocation information**
- Build **one or several price estimation model** for new construction (exclusively apartments)
- Present the results to your client with the **test dataset** that will be provided to you

**Objectives:** The client wants to **correctly estimate the price** of a land in order to **identify the best opportunities**

## Scope of the case study

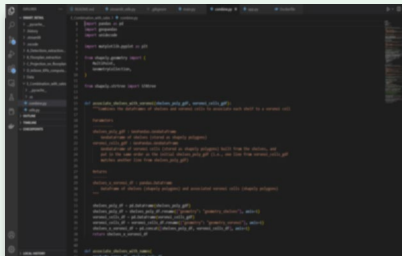
1

How to accurately **predict** the **selling price** of **properties** in a given land parcel?

2

How to **leverage** this information to give strategic recommendations to the client?

## Deliverables



1. The **code** used to build the demo tool



2. A **visual dashboard** to present the results to the client



3. A “client-ready” deck of **PowerPoint slides**



**Data available:** you have access to data from official mutation databases in Île-de-France, non-geo-localized except but for cadastral id, with large and various information on the properties

Note that as in any data science project, the data may require further data engineering before being fully leverageable

datemut	anneemut	moismut	coddep	libnatmut	vefa	valeur fonciere	codtypebien	libtypbien
22/10/2018	2018	10	75	Vente	FALSE	147000.0	121	UN APPARTEMENT
26/10/2015	2015	10	75	Vente	FALSE	95000.0	131	UNE DEPENDANCE
13/06/2019	2019	6	75	Vente	FALSE	1900000.0	152	BATI MIXTE - LOGEMENT
20/04/2017	2017	4	75	Vente	FALSE	1509000.0	121	UN APPARTEMENT
06/03/2015	2015	3	75	Vente	FALSE	28250.0	131	UNE DEPENDANCE
01/08/2017	2017	8	75	Vente	FALSE	500000.0	121	UN APPARTEMENT
03/07/2019	2019	7	75	Vente	FALSE	367000.0	121	UN APPARTEMENT
27/10/2016	2016	10	75	Vente	FALSE	90000.0	121	UN APPARTEMENT
23/11/2018	2018	11	75	Vente	FALSE	135000.0	121	UN APPARTEMENT
26/08/2016	2016	8	75	Vente	FALSE	190000.0	121	UN APPARTEMENT
28/12/2017	2017	12	75	Vente	FALSE	300000.0	14	ACTIVITE
11/06/2014	2014	6	75	Vente	FALSE	730000.0	121	UN APPARTEMENT
02/05/2018	2018	5	75	Vente	FALSE	935000.0	121	UN APPARTEMENT
11/05/2016	2016	5	75	Vente	FALSE	535000.0	121	UN APPARTEMENT
07/10/2016	2016	10	75	Vente	FALSE	339050.0	121	UN APPARTEMENT
11/07/2018	2018	7	75	Vente	FALSE	413438.0	121	UN APPARTEMENT
22/10/2018	2018	10	75	Vente	FALSE	3327000.0	14	ACTIVITE
06/02/2018	2018	2	75	Vente	FALSE	650000.0	122	DEUX APPARTEMENTS
04/09/2018	2018	9	75	Vente	FALSE	375000.0	14	ACTIVITE
09/02/2015	2015	2	75	Vente	FALSE	163000.0	121	UN APPARTEMENT
18/06/2020	2020	6	75	Vente	FALSE	768490.0	121	UN APPARTEMENT
07/06/2017	2017	6	75	Vente	FALSE	15000.0	14	ACTIVITE
13/11/2014	2014	11	75	Vente	FALSE	480000.0	121	UN APPARTEMENT
30/03/2018	2018	3	75	Vente	FALSE	823000.0	121	UN APPARTEMENT
14/09/2015	2015	9	75	Vente	FALSE	250000.0	121	UN APPARTEMENT
16/02/2018	2018	2	75	Vente	FALSE	2873000.0	122	DEUX APPARTEMENTS
11/03/2019	2019	3	75	Vente	FALSE	525000.0	121	UN APPARTEMENT



Mid-term  
nudge

✓ After two days, you could be provided with a geo-localized version of this dataset



**Resources :** You are free to **use any resources** you want, here are some recommendations to help you get started

### Languages



*We highly recommend you use Python even though same kind of results could be achieved with similar tools*

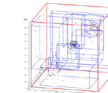
### Relevant libraries



*To develop a wide range of ML models*



*To use geo-localized visualization tools*



*Rtree*

*To use geo-localized advanced ML models*



*Streamlit*

*To efficiently develop a dashboard / front-end*

For information: the process of geo-location is independent from the rest of the challenge

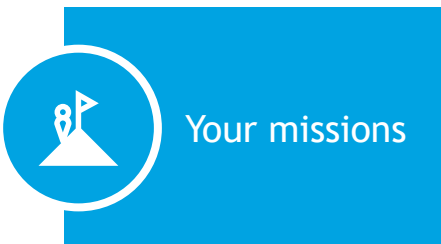
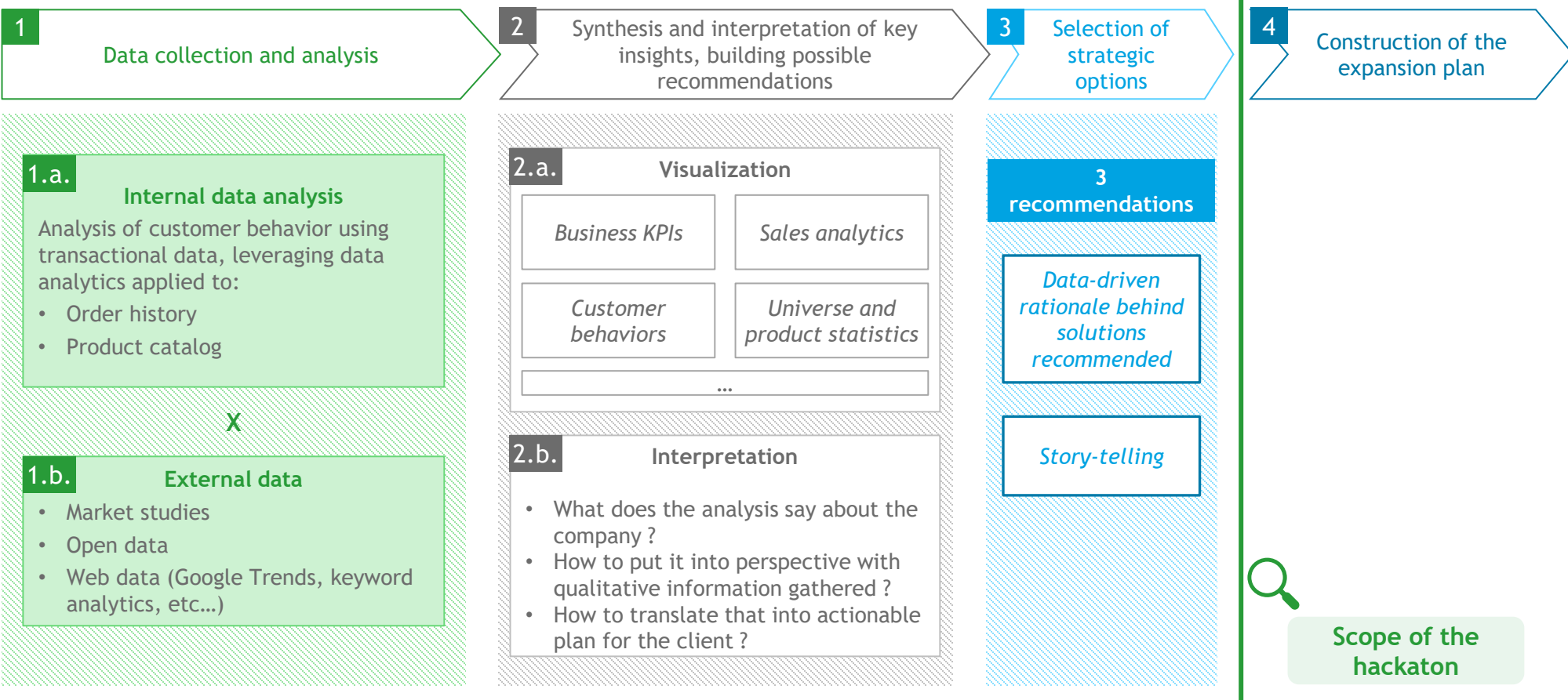




# Mind Market Operation

*defining a diversification strategy based on customer behaviors*

**Context:** the client HomeCo, a player in the **furniture distribution industry**, wants to be a more “**data-driven**” company, making **strategic decisions based on advanced analytics**



- **Analyse transactional data** and understand client’s performance, buying behaviors, underlying trends, etc...
- Build management dashboard with key KPIs and visualizations for the board to understand company’s performance at a glance
- Enrich analysis using **external sources** of data, both **qualitative and quantitative**
- Extract **key insights** from acquired data and **synthesize recommendations** for your client

**Objectives:** The client wants to **understand past years' performance** relative to the market, to define its **strategy for the years to come**

## Scope of the case study

1

How to **visualize** key **analysis** from transactional data and external sources ?

2

How to **leverage** this information to give strategic **recommendations** to the client?

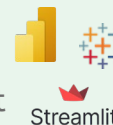
## Deliverables



1. The **code** used to make analysis



2. A **visual dashboard** to present the results to the client



3. A “client-ready” deck of **PowerPoint slides**







Data available: transaction data are every client and product in the database, on several years period

Unique identifier of a customer

Detailed order view

Base Price Product Price

id_customer	enrollement_date	postcode	city	country	order_date	id_order	id_order_detail	id_sale	id_brand	product_id	product_quantity	base_price	unit_price_TTC	discount_name	discount_value	campaign	MULTI	univers_final
ff281d29b0	12/12/2011	31280	dremil laf	France	01/01/2017	e5d1662cd4	eeef281626	d35bf56ac	0	a1f5e02237	1.0	75.0	44.95		0.0		0 Mono	Home & Kitchen
40e6459011	07/05/2016	13120	GARDANN	France	01/01/2017	b5fb7afd3f	cf11fd3e37	dfbddd2f1	0	599c0da757	1.0	108.33	35.94		0.0		0 Mono	Music, Movies & TV Shows
fcc35e53ff	14/04/2011	12850	ONET LE C	France	01/01/2017	fef6385286	c4d5ca320b	e369628fe	0	1e37f34121	1.0	108.33	64.95		0.0		0 Mono	Dining Room Furniture
78f16e45e2	22/06/2015	50012	Bagno A R	Italie	01/01/2017	226ecf0f85	a514a361e8	668f33215	0	3173eb5e2e	1.0	90.16	45.24		0.0		0 Mono	Mattresses
c6bbf3f5bd	03/08/2015	28916	leganes	Espagne	01/01/2017	0922b7e5fc	46a6ae6f13	b8f36d2df	0	333b1eb512	1.0	107.44	57.43		0.0		0 Mono	Storage & Organization
62673f1817	13/01/2016	34070	montpelli	France	01/01/2017	2cf11f1e84	47f4071f9b	dd1970fbC	0	a52ba32d0f	1.0	58.33	39.95		0.0		0 Mono	Arts, Crafts & Sewing
d83a6f3065	03/05/2013	97110	POINTE A	Guadeloup	01/01/2017	b938b3ec0a	f0671a0367	3c550e0c2	0	780d8dee4d	1.0	16.67	6.63		0.0		0 Multi	Lighting Fixtures
d83a6f3065	03/05/2013	97110	POINTE A	Guadeloup	01/01/2017	b938b3ec0a	86372c9eed	3c550e0c2	0	2050edbc69	1.0	41.67	16.63		0.0		0 Multi	Lighting Fixtures
d83a6f3065	03/05/2013	97110	POINTE A	Guadeloup	01/01/2017	b938b3ec0a	9f08342e78	3c550e0c2	0	bce0846c9d	1.0	29.17	7.46		0.0		0 Multi	Lighting Fixtures
1bbebd0ada	27/10/2015	17176	Sant estev	Espagne	01/01/2017	5ea4531ea8	48d92e3db7	0e1422ea7	0	0636d979af	1.0	82.64	30.2		0.0		0 Mono	Mattresses
935a462958	31/07/2015	92310	SEVRES	France	01/01/2017	c5ad012cbe	d882fce580	4ef2f8259	0	447d1fee43	1.0	37.91	21.95		0.0		0 Mono	Software
935a462958	31/07/2015	92310	SEVRES	France	01/01/2017	c5ad012cbe	6e88e1df49	4ef2f8259	0	f3b677a281	1.0	37.91	21.95		0.0		0 Mono	Software
515981d81f	17/04/2012	13451	Marseille	France	01/01/2017	4a20fd2537	256fd19fff	912e79cd1	0	a1ad0d5a1e	1.0	116.67	74.96		0.0		0 Mono	Music, Movies & TV Shows
515981d81f	17/04/2012	13451	Marseille	France	01/01/2017	4a20fd2537	0e7527f224	912e79cd1	0	6dd1269d30	1.0	116.67	74.96		0.0		0 Mono	Music, Movies & TV Shows
967b6ad172	31/12/2016	87400	SAINT-LEC	France	01/01/2017	a234589fc4	f865f02cf8	d550216af	0	b904582195	1.0	87.5	33.95		0.0		0 Mono	Music, Movies & TV Shows
5a39baf057	02/10/2015	69290	SAINT-GEI	France	01/01/2017	686116ab3d	f6e460c64c	3c550e0c2	0	48617ceade	1.0	16.67	6.95	550627c26e	5.0		0 Multi	Lighting Fixtures
5816daa35c	01/01/2017	57050	METZ	France	01/01/2017	f4a3bbe979	4beea2c8a5	853573b5a	0	1e0268aac9	1.0	33.33	19.95		0.0		0 Mono	Dining Room Furniture
8721aed98f	25/03/2014	66120	EGAT	France	01/01/2017	77e1cb520a	ee8ca33756	39cec6d4d	0	a1e048ff00	1.0	25.0	14.5		0.0		0 Mono	Music, Movies & TV Shows
8721aed98f	25/03/2014	66120	EGAT	France	01/01/2017	77e1cb520a	5fa600bc37	39cec6d4d	0	7eddbede2e	2.0	25.0	14.5		0.0		0 Mono	Music, Movies & TV Shows
5816daa35c	01/01/2017	57050	METZ	France	01/01/2017	b2c691d794	154e513990	853573b5a	0	1e0268aac9	1.0	33.33	19.95		0.0		0 Mono	Dining Room Furniture
e48d078a8c	22/11/2015	14019	Villanova	Italie	01/01/2017	a5c80e2448	fb3fab080c	ca886eb9e	1979	4d1c3061b6	1.0	13.11	8.08		0.0		0 Multi	Dining Room Furniture
e48d078a8c	22/11/2015	14019	Villanova	Italie	01/01/2017	a5c80e2448	d2dfbd4e02	ca886eb9e	1979	802329c848	1.0	16.39	10.12		0.0		0 Multi	Dining Room Furniture
e48d078a8c	22/11/2015	14019	Villanova	Italie	01/01/2017	a5c80e2448	ba9ffebaa2	ca886eb9e	1979	0574a44dc9	1.0	20.49	12.71		0.0		0 Multi	Dining Room Furniture
e48d078a8c	22/11/2015	14019	Villanova	Italie	01/01/2017	a5c80e2448	3f45e0a920	e64c9ec33	0	9b3737b4df	1.0	81.97	40.62		0.0		0 Mono	Health & Household



Attention Point

- Our client is a **reseller**: the “base price” of the product sold is in the “**base\_price**” column, and the “new price” at which the item is sold is in the “**unit\_price\_TTC**”
- We **can't** totally trust the “**base\_price**” column since it's a **partial** and **biased** information computed by the reseller



**Data available:** you also have access to a product database which link every product id with a price

Recommended  
retail price

id_sale	id_product	PVC	Prix XXX
d363681435	f07b7035fa	160	79,99
d363681435	7ac0f62ef1	95	29,99
d363681435	aa407508d1	140	45,99
d363681435	c7cf40aef9	300	118,99
d363681435	1783b3086c	280	89,99
d363681435	30c17dcf34	140	50,99
d363681435	c4de77e748	200	61,99
d363681435	bbdde73bf7	180	43,99
d363681435	c8f0a6bf49	85	26,99
d363681435	7626c22ccb	180	51,99
d363681435	235aefb318	50	24,99
d363681435	129114f802	50	10,99
d363681435	e5c018c241	45	17,99
d363681435	dfbc0115fb	130	47,99
d363681435	0af148472d	55	12,99
d363681435	72f2c5f247	45	9,99
d363681435	ca40ac2867	100	20,99
d363681435	b6f85520b1	80	20,99
d363681435	12e2d8d069	60	20,99
d363681435	423a0ababe	65	15,99
d363681435	5a8fb05c3f	80	24,99
d363681435	a7e420c382	65	15,99
d363681435	fd3264ef91	95	39,99
d363681435	30d1b7bac8	42	12,99
d363681435	50f1d1c784	80	30,99

**Resources :** You are free to **use any resources** you want, here are some recommendations to help you get started

### Languages



*We highly recommend you use Python even though same kind of results could be achieved with similar tools (with R for instance)*

### Relevant libraries



*To develop a wide range of ML models*



*To efficiently manipulate and analyze large datasets*



*To easily plot interactive graphs*



**Streamlit**

*To efficiently develop a dashboard / front-end*

### For information: the origin source of the data



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Schedule for the five days: the timing may be short, do not hesitate to split the work between the members of the team



	Monday 13 <sup>th</sup>	Tuesday 14 <sup>th</sup>	Wednesday 15 <sup>th</sup>	Thursday 16 <sup>th</sup>	Friday 17 <sup>th</sup>
AM session	 <b>9.00 am Kick-off session</b> <i>Auditorium Michelin - Eiffel</i>	 <b>Free working session</b> <i>Classrooms</i>	 <b>Free working session</b> <i>Classrooms</i>	 <b>Free working session</b> <i>Classrooms</i>	 <b>9.00 am &gt; 1.00 pm Pitches session</b> <p>Pitches will take place in front of a 3 people jury: 2 technical profiles and 1 business profile</p>
PM session	 <b>Free working session</b> <i>Classrooms</i>	<b>Q&amp;A - tech</b>	<b>Q&amp;A - tech</b>	<b>Q&amp;A - business</b>	 <b>3.00 pm Closing session</b> <p>The best team of each topic will pitch in front of the whole class</p>
	<div>2.00pm - The Right Price</div> <div>3:00pm - Mind Market Operation</div>	<div>2.00pm - The Right Price</div> <div>2.00pm - Mind Market Operation</div>	<div>2.00pm - The Right Price</div> <div>3.30pm - Mind Market Operation</div>	<div>2.00pm - The Right Price</div> <div>3.00pm - Mind Market Operation</div>	

# The Slack workplace

For this challenge, we opened a **Slack workplace** for you to ask your questions when eleven consultants are not on campus

On this workplace, you will find three channels:

- 1) **général**: for all questions and information related to the organization of the challenge
- 2) **TheRightPrice**: for all questions specifically related to *TheRightPrice* case
- 3) **Mind Market Operation**: for all questions specifically related to *Mind Market Operation* case

Additional information may also be pinned in these channels (schedules, classroom numbers, etc.)

*Please use the right channel to ensure fluidity of the interactions*

*Before asking something, also make sure that the requested information has not been given already ;)*

You may download the slack application on your device or access it via your usual browser



[bit.ly/3HWK417](https://bit.ly/3HWK417)

# Download instructions & submission process

## How to download datasets ?

You can **download datasets** and potential additional information at the following links:

- **Case #1: TRP** - [get your files here](#)

 Nom ▾	Modifié ▾	Modifié par ▾
 Data non localisée	vendredi à 08:50	Marco CAMPAGNA
 Test set	vendredi à 08:50	Marco CAMPAGNA
 lexique_variables.csv	vendredi à 08:50	Marco CAMPAGNA
 lexique_variables.xlsx	vendredi à 08:50	Marco CAMPAGNA

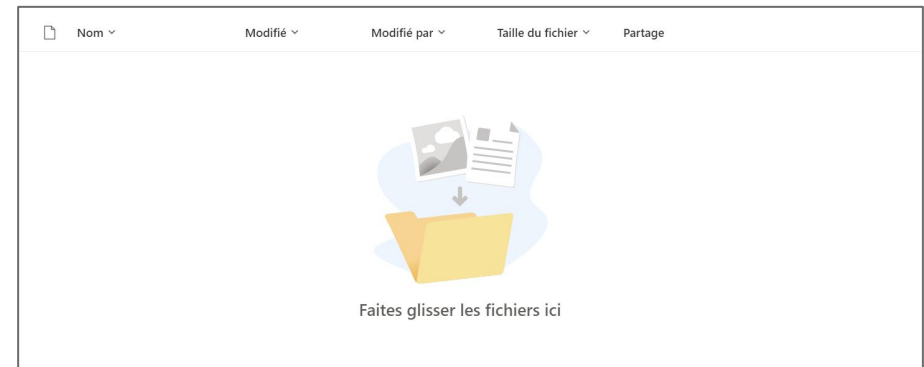
*Note: geo-localized data will not be shared before the 2 first days*

- **Case #2: MMO** - [get your files here](#)

 Nom ▾	Modifié ▾	Modifié par ▾
 ANALYTICS.zip	Il y a quelques secondes	Marco CAMPAGNA

## How to submit your works ?

Each team will receive a **link by email** with a **Sharepoint folder** to submit their assignment (both Presentation + Code)



### Notes:

- You can organize your folder as you wish.
- You can keep old files that should not be submitted to the jury in a *0\_Archives* folder

## Final presentation details and best practices:

On **Friday 17<sup>th</sup>**, you will have to present your work in front of a **jury** during a **closed-door session**

The modalities of the presentation will be as follow:

- **10min group pitch** based on a PowerPoint presentation
- **~10min Q&A session** with the jury
- **~5min debrief** from the jury

For each supercase, a winner will be announced. The three winners will then **present their work to the other students** (same modalities with questions from the students)

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The presentation must be **as professional as possible**. Here are some advices and best practices that may be useful:



- **Structure your presentation:** start by stating the problem that you want to solve, then present the way you tackled it, and finally describe your solution. The “story” of the presentation should be natural and easy to follow
- **Be concise and precise:** focus on the most important messages, as you only have 20 minutes to present the work achieved for the entire week. You should limit the number of slides you present (you can still add appendices if needed)
- **Be organized as a team:** split up the speaking time between the team members beforehand to make it smoother
- **Be honest:** tell where you encountered issues or challenges
- **C-suite level:** you should convince both the CEO and the CTO/CDO of the company

## Evaluation criteria:

Although different in their essence, the cases will be graded based on **similar criteria**.

NB: any **provided code will be tested** in order to ensure its good functioning.

*\*The contribution of each criteria may not reflect the actual value in a final mission restitution*

Topic		Description	Contribution to the final grade*
Engagement		The <b>engagement</b> of the team during the exercise (how far you've gone, how autonomous you have been, how much you have asked questions when stuck, etc.)	2 points
Business aspect	Presentation quality	The <b>quality of your final presentation</b> : how professional it looks ( <b>slide quality</b> ), how clear and complete it is ( <b>storytelling</b> ), how pertinent your answers are, etc.	3 points
	Business methodology	The <b>creativity</b> and <b>relevance</b> of the <b>methodology</b> (i.e. scientific approach) you choose regarding the problem you try to solve, and the data provided, the <b>business sense</b> behind your <b>methodology</b> and the <b>pragmatism</b> of your <b>presentation</b>	6 points
Technical aspect	Technical choices	The explanation of your <b>technical choices</b> and your <b>ability</b> to <b>present them</b> in non-technical terms	3 points
	Model efficiency or Analysis relevance	The <b>performance</b> of your model (specific to each case), the <b>relevance</b> for the <b>problem in question</b> , the <b>quality</b> of the <b>analysis</b> led	5 points
	Code good practices	Your code must be <b>well structured</b> , <b>easy</b> to <b>run</b> and <b>easy</b> to <b>understand</b> with clear readme and requirements.	1 point

Please note that all groups will be graded at the end of the week

Enjoy the challenge!