

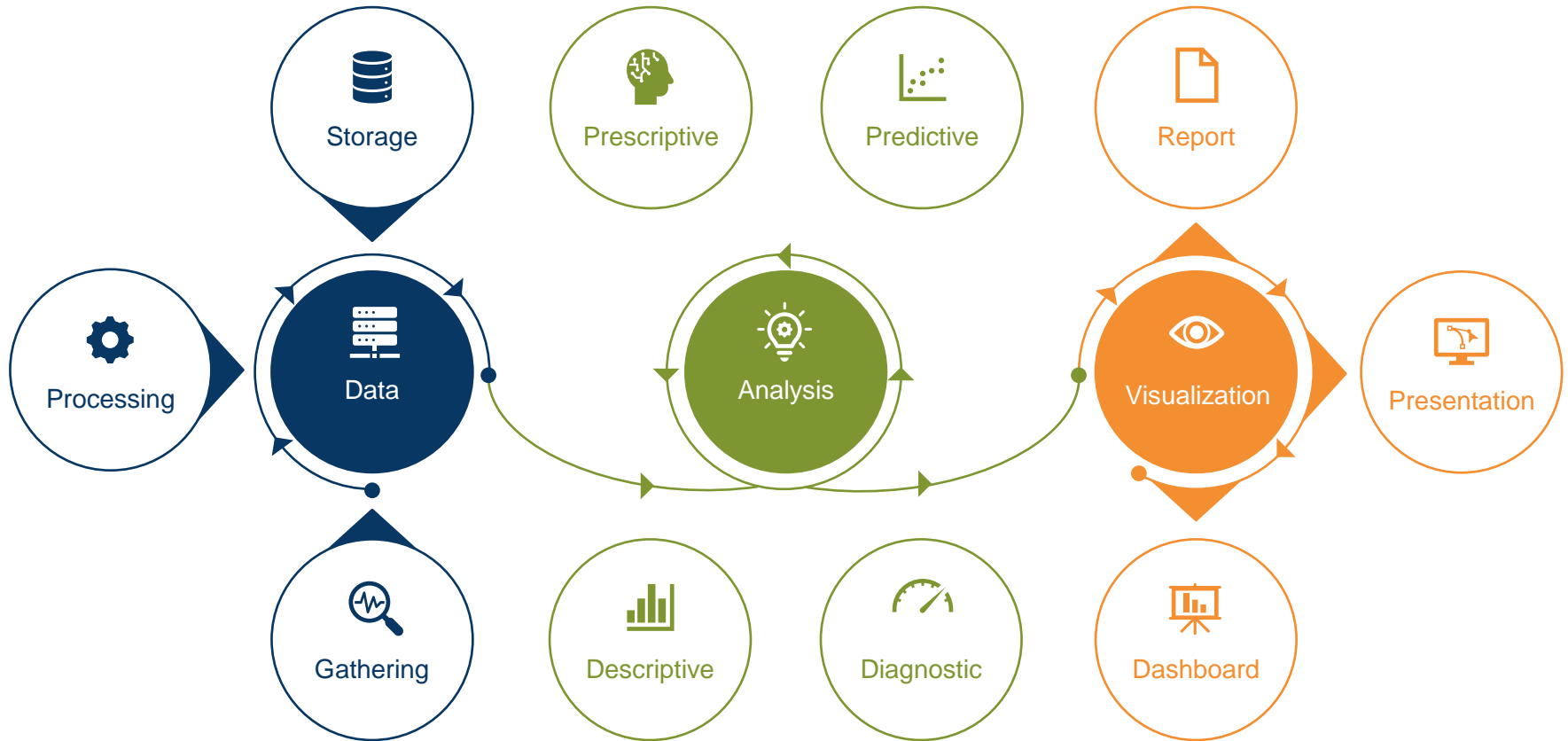


# Data Analytics

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Case Study

# Introduction | Illustrative Data Analytics Process



# Introduction | Case Description

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In order to illustrate the various steps and methods involved in a typical data analytics process, we present the following case study. The aim is to provide an example of how different tools are utilized and what insights can be derived through these analyses.



We conducted an analysis on a selection of Switzerland's largest furniture stores. Wineus has successfully closed several transactions within this sector, collaborating with various stakeholders. To maintain anonymity, we randomly selected a furniture store as our exemplary client for our analysis (called "Furniture AG") and anonymized all data.



The analysis involves comparing the population coverage and market potential of catchment areas for different furniture stores, identifying optimal acquisition targets for Furniture AG, calculating the optimal store network and conducting a competitive analysis for each grid point in Switzerland.



We defined the catchment area of furniture store branches as a 40-minute car travel time, considering that private vehicle transport is likely the primary mode of furniture transportation. This 40-minute travel time is considered a realistic duration for customers to travel when purchasing furniture.

**1.6%**

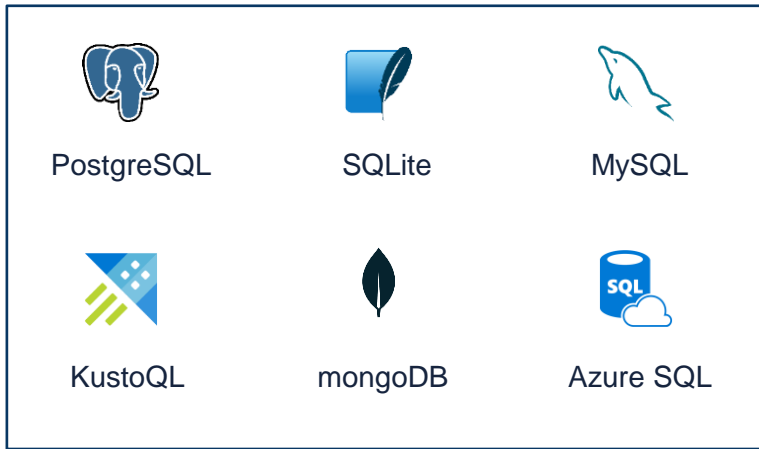
Market potential is determined based on taxable income at the municipal level, assuming that individuals allocate 1.6% of their taxable income towards furniture and furnishings expenditures. This calculation yields a total market potential for the furniture and furnishings market in Switzerland of CHF 4.7 billion.



It's important to note that all data used in this case study are publicly available and obtained at no cost. Detailed information regarding data sources and data processing steps can be found on the subsequent slides, along with a presentation of the tools utilized in each step, displayed in the upper right corner.

# Introduction | Selection of Tools used

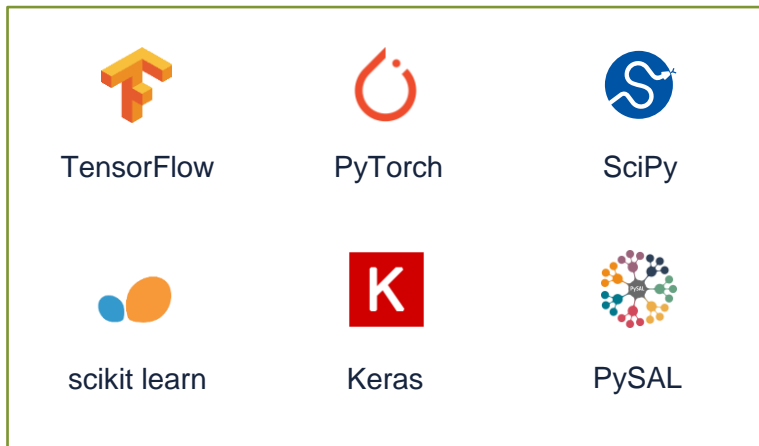
## Data storage and retrieval



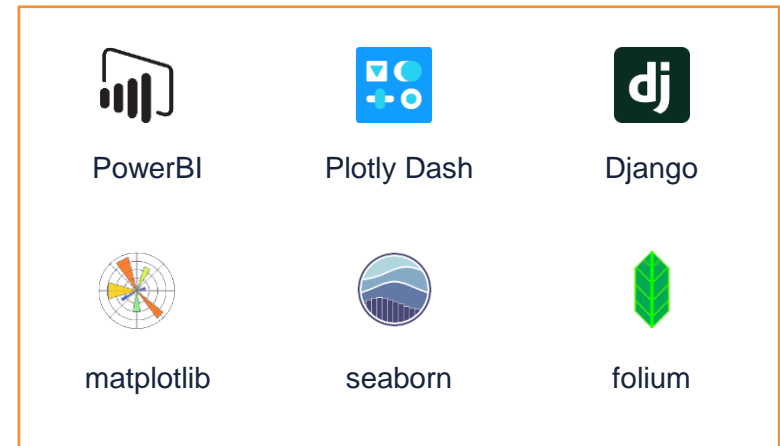
## Programming



## Machine Learning



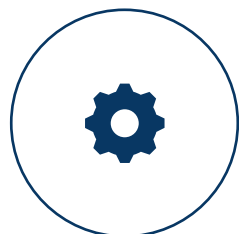
## Visualization





## Gathering

- A variety of data sources were tapped into, employing diverse procurement methods
- Some datasets could be easily imported directly into spreadsheets, others required alternative approaches
- To obtain the necessary raw data, we accessed data from official Swiss authorities and utilized various API services
- The data basis is as of the reporting date 31.12.2021



## Processing

- The raw-format data underwent several essential transformative steps, including aggregation, standardization of coordinate systems and geographic data processing
- The procedures enabled efficient data storage and the creation of functional connections
- In this particular case, we used the Python programming language for data processing

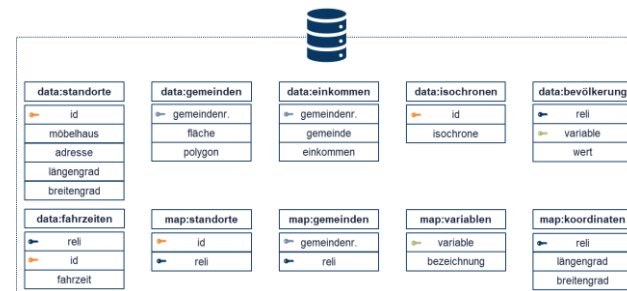


## Storage

- Following the meticulous processing phase, the data is securely stored within a database, with interconnections (keys) established between data tables.
- This approach helps eliminate redundancies and minimizes the required storage space.
- In this case, POSTGRES was chosen as the database platform.

	Addresses of biggest furniture stores
	Population data from Bundesamt für Statistik
	Income data from Eidgenössische Steuerverwaltung
	Swiss municipalities from Bundesamt Landestopographie
	Polygons for each store with 40 minutes driving time
	Driving times & distances for each grid point

247	Furniture store addresses
27m	Population data points
6'666	Income data points
2'862	Municipal polygons
247	Isochrone polygons
172m	Travel time and distance combinations





9  
stores

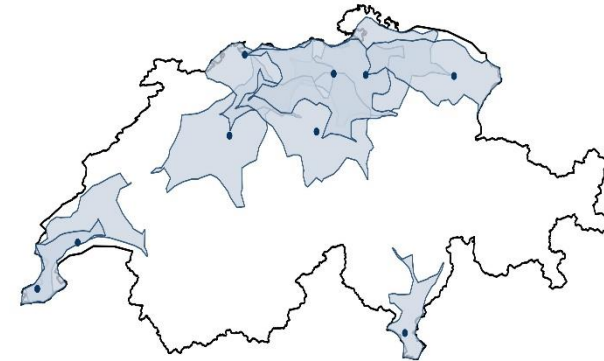
7.0m  
population covered

32 min  
Ø driving time to nearest store

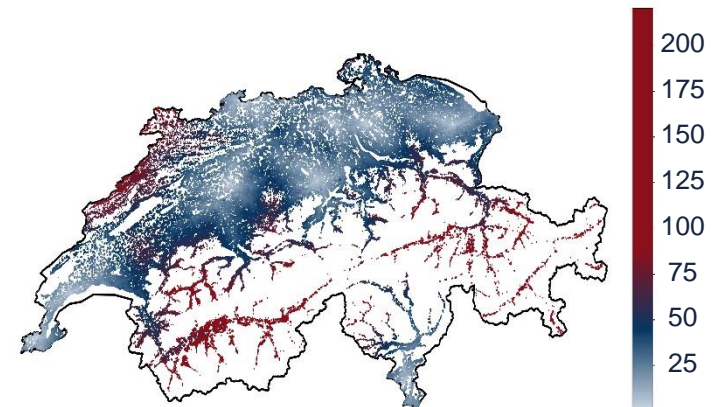
CHF 4.0b  
market potential covered

## What is Furniture AG's current coverage?

- Furniture AG has nine stores marked as blue dots on the upper map.
- With a maximum travel time of 40 minutes, these stores cover approximately 80% of the Swiss population, equivalent to 7.0 million people.
- Some catchment areas of these stores, indicated by the blue areas on the upper map, exhibit significant overlap and, in certain cases, multiple overlaps.
- The existing store network of Furniture AG covers a market potential of CHF 4.0 billion, representing 84% of the overall market potential.
- On average, one can reach the nearest Furniture AG store within 32 minutes.
- As expected, driving times are longer for people in alpine areas or in regions with lower population density, as shown by the red areas on the map below.

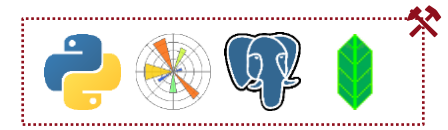


40-minute isochrones of the stores



Driving time to nearest store (in minutes)

Furniture AG covers a population of 7.0m (80%) and a market potential of CHF 4.0b (84%) with its store network.



238

competitor stores

95%

max. coverage rate

67

max. number of stores

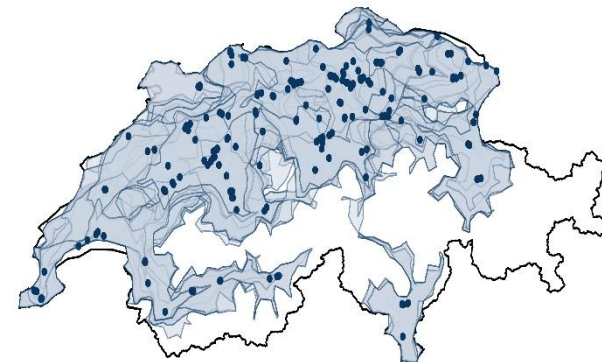
CHF 4.6b

max. market potential covered

## What is the current coverage of the competition?

- As indicated in the table, some competitors display significantly higher coverage rates and more store locations than Furniture AG.
- Notably, Target 1 leads the field with a coverage rate of 95%, serving a vast population through its 24 stores and capturing a market potential of CHF 4.6 billion.
- Some competitors are pursuing a strategy that involves several smaller stores spread throughout Switzerland.
- The strategic placement of the stores plays a crucial role, particularly with respect to their proximity to highways, which significantly extends their catchment area.
- Some competitors provide greater coverage in regions such as Valais, the Jura region, the canton of Grisons and specific areas of Western Switzerland compared to Furniture AG.

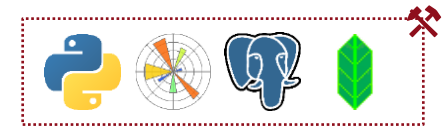
Competitors	Stores	Coverage
Target 1	24	95%
Target 2	38	93%
Target 3	22	93%
Target 4	18	92%
Target 5	23	91%
Target 6	67	89%
Target 7	29	82%
Target 8	7	72%
Target 9	8	61%
Target 10	2	29%



Competitor stores with 40-minute isochrones

Some competitors achieve coverage rates as high as 95% and maintain a more expansive network of furniture stores.





8.7m

Swiss population

2'222

Swiss communities

3.8m

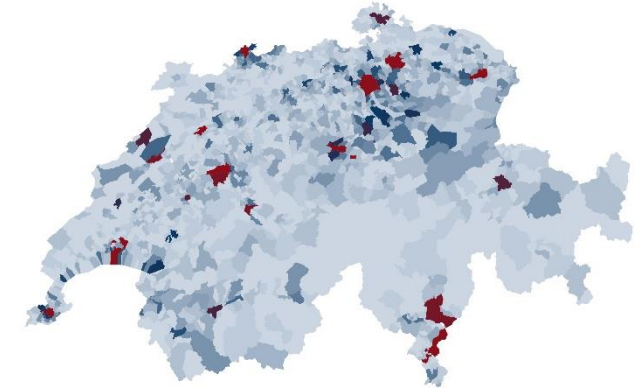
taxpayer

74k

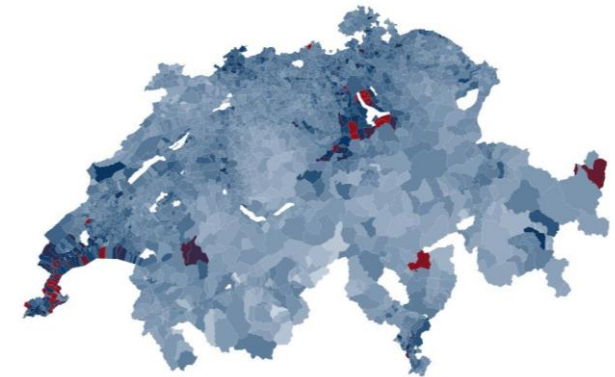
Ø taxable income

## Why is Furniture AG present at these locations?

- Furniture AG's catchment area encompasses the most densely populated regions, highlighted in red on the population graph.
- A significant portion of municipalities exhibiting the highest purchasing power, denoted by red areas on the income graph, falls within Furniture AG's catchment area.
- In municipalities covered by Furniture AG, the taxable income is nearly 10% higher than the Swiss national average.
- By estimating furniture expenditures at approximately 1.6% of household spendings and considering taxable income data from the Eidgenössische Steuerverwaltung, the overall market potential amounts to CHF 4.7 billion.
- Out of a total of 3.8 million taxpayers, 2.5 million are employed, while 1.2 million are retirees or not actively employed.



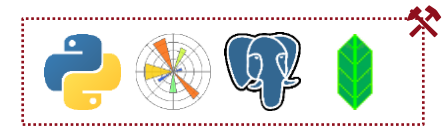
Population by municipality



Taxable income by municipality

The store locations can to some degree be attributed to demographic factors and income distribution.





**+67**  
locations

**+22%**  
population covered

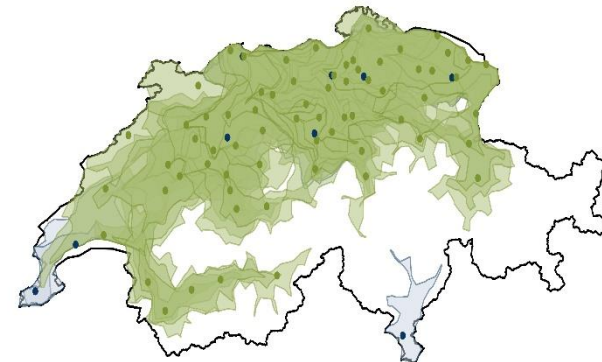
**-18 min**  
Ø travel time to nearest store

**+18%**  
market potential covered

## What happens when Furniture AG acquires a competitor?

- To effectively expand its client and market potential through competitor acquisition, the optimal choice for Furniture AG would be to acquire Target 6.
- This remains true even when applying a purchase price multiple of 1x estimated sales.
- When examining the catchment areas of Furniture AG, it's evident that the store network of Target 6 displays the smallest overlap, thus presenting the greatest potential for complementarity.
- Following the acquisition of Target 6, a total of 8.6 million Swiss residents would have access to a Furniture AG store within a 40-minute drive.
- Target 10, on the other hand, presents the least additional potential, as it only has two stores in locations similar to Furniture AG.

Competitor	Population	Market Potential	~Sales
Target 6	1.57m	714m	175m
Target 5	1.35m	622m	307m
Target 1	1.33m	607m	204m
Target 2	1.17m	547m	386m
Target 3	1.11m	508m	321m
Target 4	1.08m	502m	550m
Target 7	0.94m	442m	436m
Target 8	0.41m	190m	175m
Target 9	0.36m	168m	50m
Target 10	7 k	5m	40m



Combined Furniture AG (blue) and Target 6 (green) store network

Acquiring Target 6 maximizes both the population reached and the market potential covered.

# Prescriptive Analysis



9  
locations

+10%  
population covered

-5 min  
Ø driving time

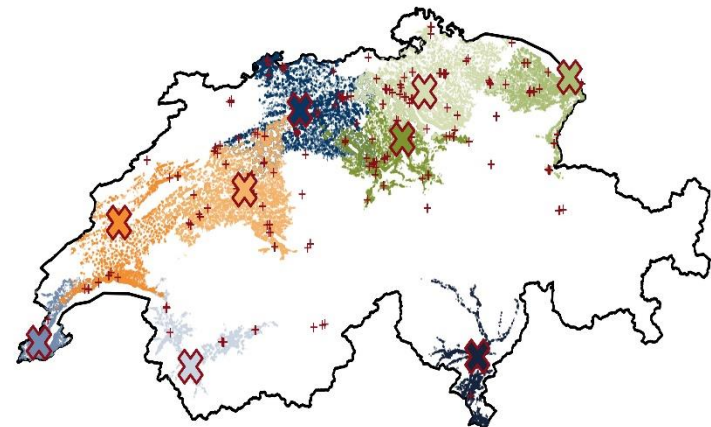
+8%  
market potential covered

Where would the stores need to be placed to achieve optimal coverage?

- To determine the most effective branch placement, we employed the "Maximum Covering Location Problem" algorithm. This approach aims to maximize the coverage of a population within a specified distance by strategically situating a fixed number of facilities.
- We used average taxable income as the primary weighting criterion to assign higher significance to locations with a population possessing greater purchasing power.
- By selecting the locations listed on the right, we are able to maximize the coverage of Furniture AG's market potential.
- With these store locations, Furniture AG covers a population of 7.7 million people and a market potential of CHF 4.3 billion. This represents an improvement over the base case in which Furniture AG reached 7 million people with a market potential of CHF 4.0 billion.

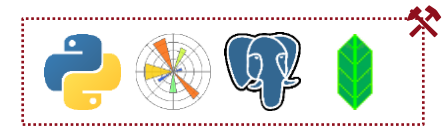
n = 247 selection from n locations

- |  |                        |  |                      |
|--|------------------------|--|----------------------|
|  | Target 3 – San Antonio |  | Target 6 – Cham      |
|  | Target 1 – Egerkingen  |  | Target 6 – Thal      |
|  | Target 1 – Vernier     |  | Target 5 – Dietlikon |
|  | Target 6 – Martigny    |  | Target 5 – Montagny  |
|  |                        |  | Target 7 – Bern      |



Optimal locations and their coverage area

For optimal coverage with 9 stores (income as a weighting factor), Furniture AG should select the listed locations.



11 min

∅ travel time to nearest store

121k

people without any store access

63k

people with monopoly situation

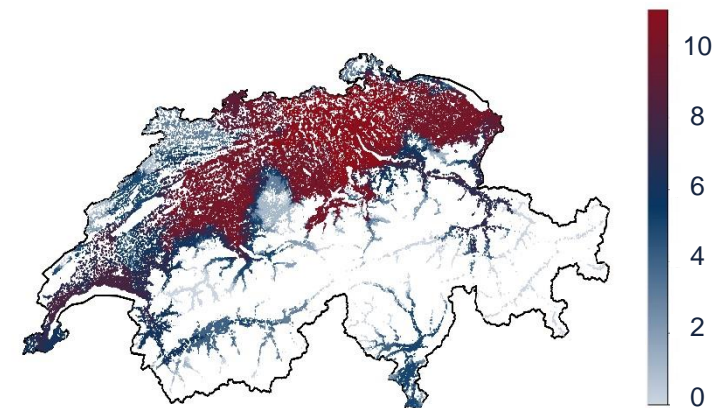
98%

of the population has a choice

## What is the prevailing competitive landscape in the furniture market?

- In the event of a major competitor acquisition, the Competition Commission requires a comprehensive report to assess potential monopoly or oligopoly scenarios.
- Across Switzerland, the average travel time to the nearest furniture store, factoring in population distribution, stands at just 11 minutes.
- Remarkably, more than half of the population has access to 10 out of the 11 analyzed companies within a 40-minute travel radius.
- Furniture AG does not hold a monopoly position. Individuals with a 40-minute travel radius to a Furniture AG store also have the option to reach at least one competitor's store within the same travel time.
- If Furniture AG were to acquire Target 3, it would expose 30'306 people to a new monopoly situation. In the event of Furniture AG merging with any other target, the monopoly situation remains unchanged.

Competitors	Persons faced with monopoly situation
Target 6	53'164
Target 7	7'484
Target 3	1'342
Target 4	277
Target 1	209
Target 5	207
Target 7	45
Target 2	3



Number of furniture stores reachable within 40 minutes



The takeover of a competitor by Furniture AG exacerbates the monopoly situation only with Target 3.



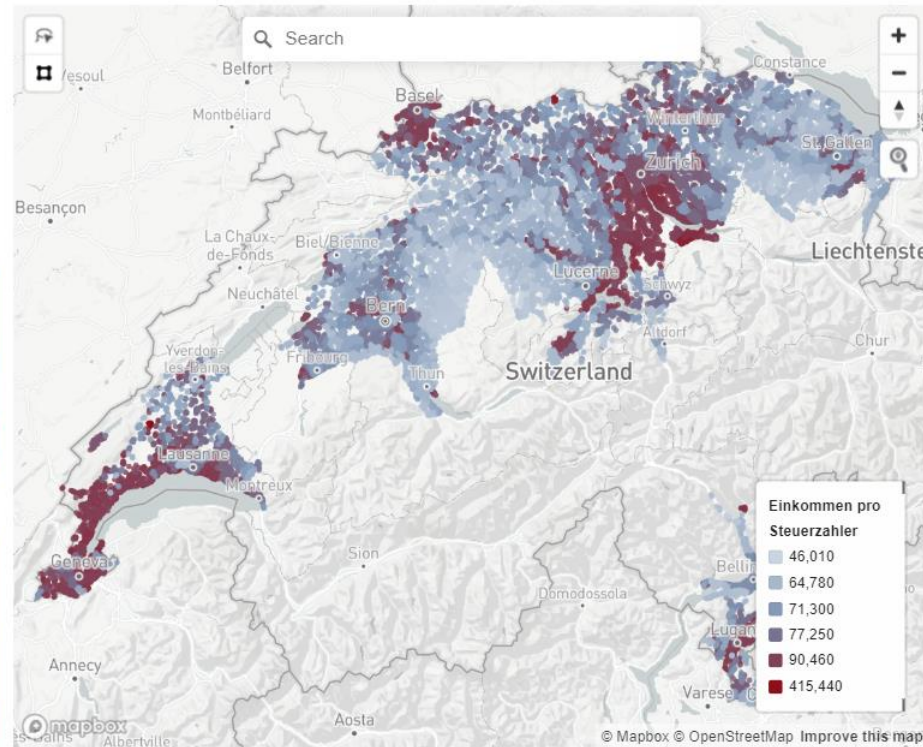
- Bevölkerung
- Potenzial
- Kunde
- Target 1
- Target 10
- Target 2
- Target 3
- Target 4
- Target 5
- Target 6
- Target 7
- Target 8
- Target 9



Nach Kanton



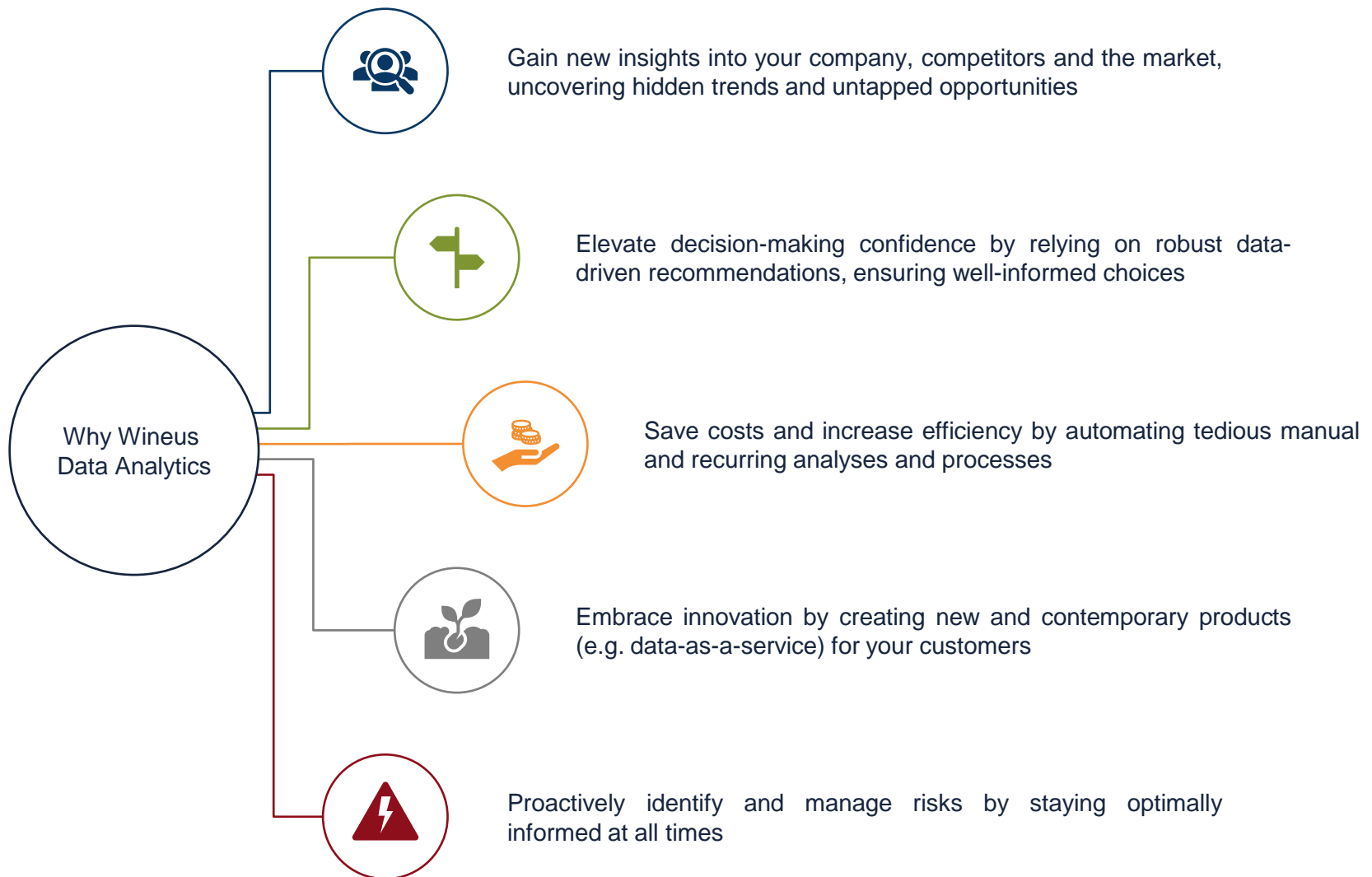
Nach Standort



# Case Study Summary

Furniture AG	<b>7.0m</b> population	Furniture AG currently covers 7.0m inhabitants (80%) of Switzerland with it's nine stores.	<b>CHF 4.0b</b> market potential	Furniture AG covers a market potential of CHF 4.0b (85%) with these stores.
Competition	<b>8.3m</b> population	The competitor (Target 1) with the highest coverage rate can serve 8.3m residents (95%) with 24 sites.	<b>CHF 4.6b</b> market potential	The competitor (Target 1) with the highest coverage rate can serve a market potential of CHF 4.6b (95%) with 24 locations.
Acquisition	<b>+18%</b> market potential	The acquisition of Target 6 increases the market potential covered by a 18%.	<b>-18 min</b> Ø driving time	The acquisition of Target 6's store network reduces the average driving time to the nearest store from 32 to 14 minutes.
Optimization	<b>+8%</b> market potential	If Furniture AG were to optimally place it's nine stores, the covered market potential would increase by 8%.	<b>-5 min</b> Ø driving time	If the Furniture AG were to optimally place it's nine stores, the average driving time would be reduced by 5 minutes.
Monopoly	<b>121k</b> people	Within the specified 40-minute travel time, 121k Swiss residents do not have access to any of the 247 furniture store branches analyzed.	<b>63k</b> people	63k people can't choose between different providers and thus face a monopoly situation.

# Selection of Reasons for the Use of Wineus Data Analytics



# Contacts

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