Infomineo Data Analytics Services

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DATA ANALYTICS USE CASES EXAMPLES

1. **A Comprehensive Dashboard of Key HR Metrics and Performance Indicators**
2. **Assessing Candidates' Experience through Sentiment Analysis**
3. **Web Scraping Tool for Second-Hand Car Sales**
4. **Mapping Banking Services: An Analysis of Branch Locations and Demographics**

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A Comprehensive Dashboard of Key HR Metrics and Performance Indicators

CASE STUDY

Client Challenge

The client wanted to have an automated Human Resource Dashboard to track, analyze and report on HR KPIs.

The firm was looking for:

- **Effective and quick** solution
- **Smooth integration** with its existing ERPs
- **Lower cost** than subscribing to a dedicated HR Dashboard tool

Our Solution

The company decided to use **Infomineo' Data Analytics service as a solution** to cover**:**

- **Data Quality & Consistency problems** between the various Data sources
- **Dashboard creation** reflecting the HR Team's needs
- **Ad-hoc deliverables :** Dictionaries, Creation of Metadata, Data Quality onboarding

Outcome

The client benefited from Infomineo Data Analytics service on multiple fronts:

A stable and reliable data corrected in the ERPs :

- **Manual files** were **not used anymore**
- **Data Quality improved by 75%** *for critical data elements*

An organizational efficiency: **1 FTE** from the HR department could be **reallocated to other tasks**

A company wide transformation: the client started its **Data Transformation,** and tasked Infomineo to work with the client's **Finance Team to create their Financial dashboard**

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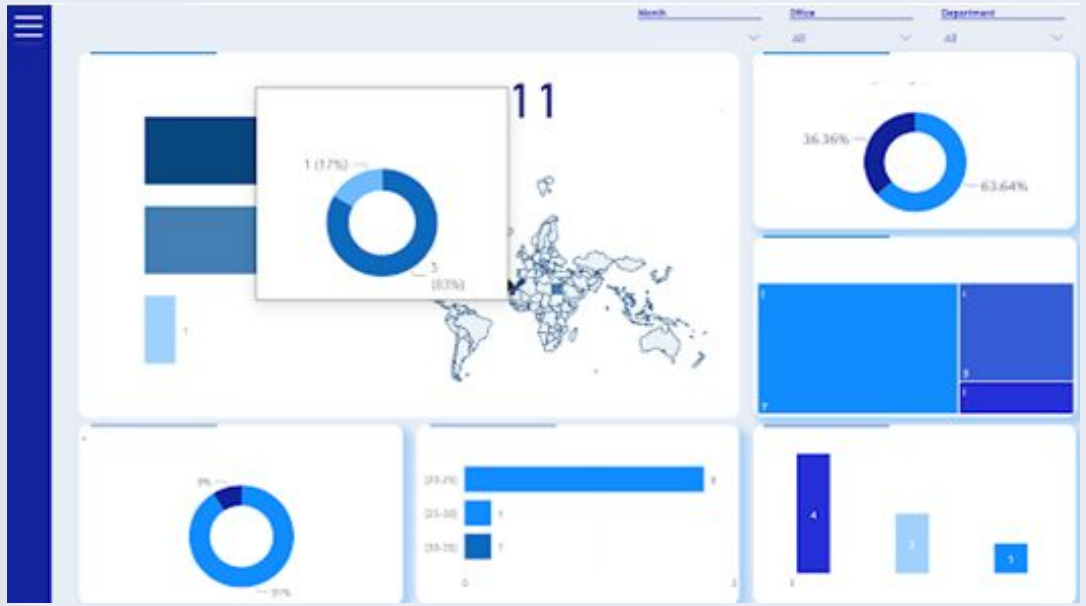
A Comprehensive Dashboard of Key Metrics and Performance Indicators

Achievements

- A **data model** has been elaborated considering that **5 tools** were identified to contain the Data source needed
- **14 source reports** have been created and their extractions' have been automatized using APIs
- **Data Quality Checks** have been automatized given business rules
- The Report created contained **3 main sections** : Administrative, Professional Development, Recruitment
- **A full-fledged report with 30 Dashboards, 150+ graphs** and **50+ KPIs**



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Assessing Candidates' Experience through Sentiment Analysis

CASE STUDY

Client Challenge

The client collects large amounts of candidates' feedback data during the recruitment process and was looking for ways to analyze the data received through a survey.

The firm was looking for:

- Automated tool to **analyse candidate feedback** as opposed to doing it manually
- Generate relevant insights from the analysed data to improve the candidate recruitment experience

Our Solution

Infomineo' s Data Analytics team addressed the client's challenges by:

- Conducting sentiment analysis using the **state-of-the-art language model Roberta** to analyze candidate feedback and **extract the overall sentiment**
- Using **AI-powered text summarization** through **Open AI's GPT-3** to extract key insights from candidate comments, focusing on areas of concern such as discrimination and unprofessionalism and showing the specific comments.
- **Creating a Dashboard :** Allowing for easy filtering of feedback and candidate sentiment

Outcome

- The analysis provided the client with a **comprehensive overview of candidate sentiments**, enabling them to identify areas of strength and areas for improvement in the recruitment process.
- In addition, the results of the analysis enabled the client to re-evaluate its recruitment procedures and **make data-driven decisions to improve the candidate experience at the global, regional, country and departmental level**.
- The results also helped the client **develop new perspectives on the power of AI-powered tools** in streamlining and enhancing the analysis of large datasets

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Assessing Candidate Experience through Sentiment Analysis

Distinguishing Positive and Negative Feedback from candidates' comments

Leveraging pre-trained Roberta Model

- Candidates' feedback cleaning and pre-processing to ensure optimal input for the model.
- Using "sentiment-Roberta-large model" as is for a start model.

Fine-tuning the model to client-needs

- Identifying limitations in the pre-trained model's
- Manual labelling of a representative sample of candidates' feedback data
- Fine-tuning the model using the labeled data to better handle nuances and provide more accurate sentiment analysis results.

End to end solution deployed

- Integrating the fine-tuned model with the ETL pipeline, automating sentiment analysis on incoming data
- Dashboarding in Power BI for dynamic visualization of key insights, trends, and actionable feedback categories

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Assessing Candidate Experience through Sentiment Analysis

Highlighting Critical Insights: Advanced Text Summarization and GPT-3 Driven Categorization

Creating Embeddings for Candidate Comments

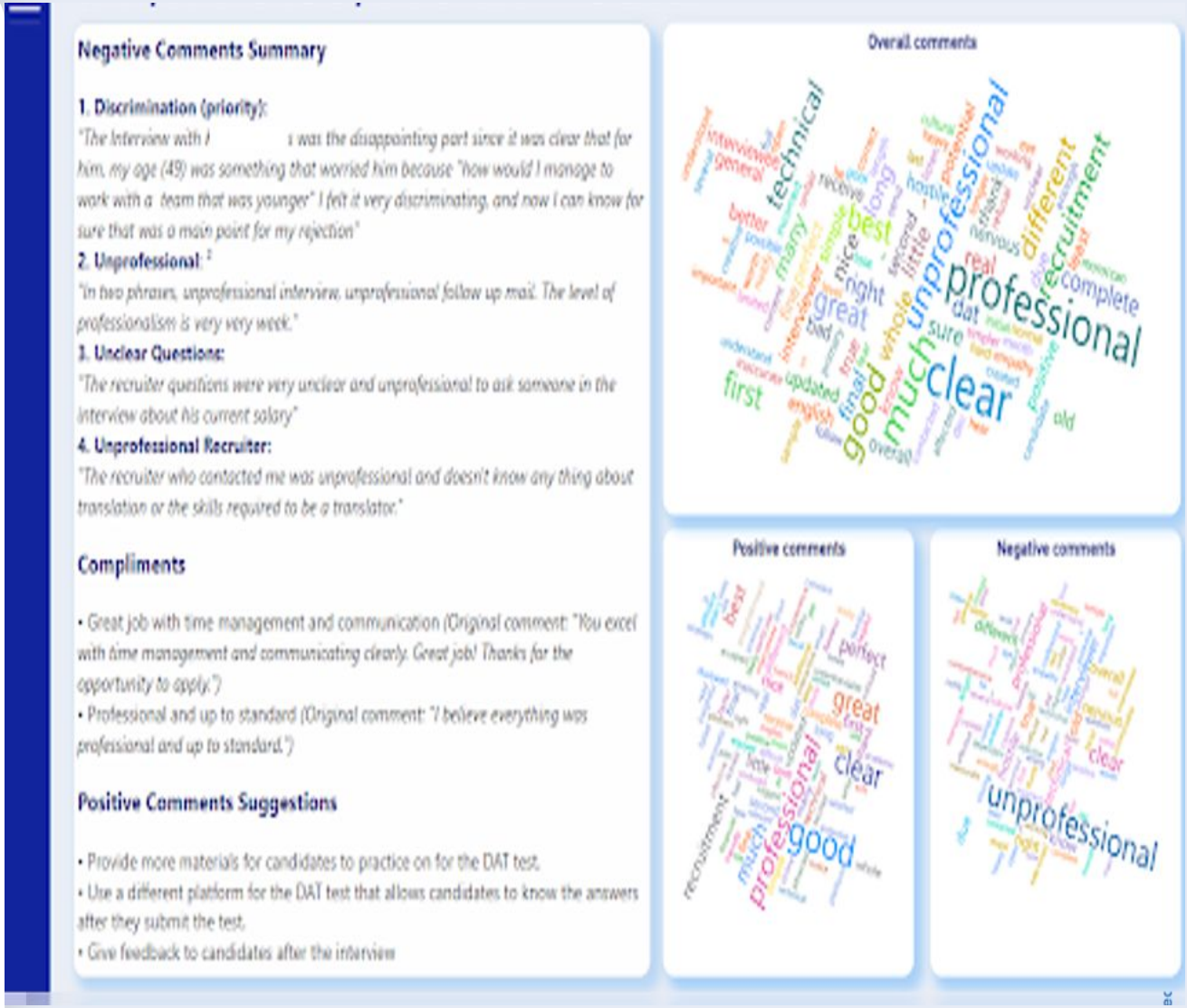
- Tokenizing candidate comments custom NLP techniques and open-source tools
- Generating high-dimensional vector representations (embeddings) for each comment via OpenAI's Embeddings API to enhance performance.

Exploiting OpenAI's GPT-3 API for Text Summarization

- Utilizing GPT-3 model, to perform targeted text summarization
- Providing the model with trained embeddings and specific summarization objectives for precise insight extraction

Prioritizing and Categorizing Comments

- Instructing GPT-3 to prioritize comments related to topics specified by the client : Discrimination, Rudeness, Suggested Improvements
- Applying custom filters and thresholds to fine-tune the categorization and selection of comments



Negative Comments Summary

1. Discrimination (priority):

"The interview with I was the disappointing part since it was clear that for him, my age (49) was something that worried him because "how would I manage to work with a team that was younger" I felt it very discriminating, and now I can know for sure that was a main point for my rejection"

2. Unprofessional:

"In two phrases, unprofessional interview, unprofessional follow up mail. The level of professionalism is very very week."

3. Unclear Questions:

"The recruiter questions were very unclear and unprofessional to ask someone in the interview about his current salary"

4. Unprofessional Recruiter:

"The recruiter who contacted me was unprofessional and doesn't know any thing about translation or the skills required to be a translator."

Compliments

- Great job with time management and communication (Original comment: "You excel with time management and communicating clearly. Great job! Thanks for the opportunity to apply.")
- Professional and up to standard (Original comment: "I believe everything was professional and up to standard.")

Positive Comments Suggestions

- Provide more materials for candidates to practice on for the DAT test.
- Use a different platform for the DAT test that allows candidates to know the answers after they submit the test.
- Give feedback to candidates after the interview

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Web Scraping Tool for Second-Hand Car Sales

CASE STUDY

Client Challenge

To analyze the secondhand automobile market in Morocco the client needed access to relevant and accurate data . The client chose to use data of the country's leading C2C e-commerce platform.

The firm was looking for:

- An efficient and consistent way to regularly collect data from an e-commerce website which operates in Morocco
- Create a database with the data collected daily to avoid bias of unsold items

Our Solution

Infomineo' s Data Analytics team addressed the client's need by:

1. Establishing data collection requirements
2. Developing a data collection plan
3. Designing a graphical user interface (GUI)
4. Cleaning and preprocessing the data
5. Allow an easy sharing of the code

Outcome

- A full-fledged webscraping tool, operable through a user interface was delivered to the client.
- The solution enabled the client to extract listings from the e-commerce platform, across all cities and categories, using specific keywords.
- The client gained time on the data collection process and created its own database of secondhand car sales.

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Web Scraping Tool for Second-Hand Car Sales

Establish data collection requirements

- Selection of **15+** core data elements that allow the client to carry out its analysis : city, type, price, gearbox, fiscal horsepower, fuel, ad link, ad date, geographical sector, model, origin, condition, mileage, first-hand, number of doors, year-model.

Develop a data collection plan

- Design a systematic plan to collect data from the chosen e-commerce platform using a home-made Web Scrapping Tool.
- Systematic data collection and storage: cars' listings are pulled daily for the whole country to build this database.

Design a graphical user interface (GUI)

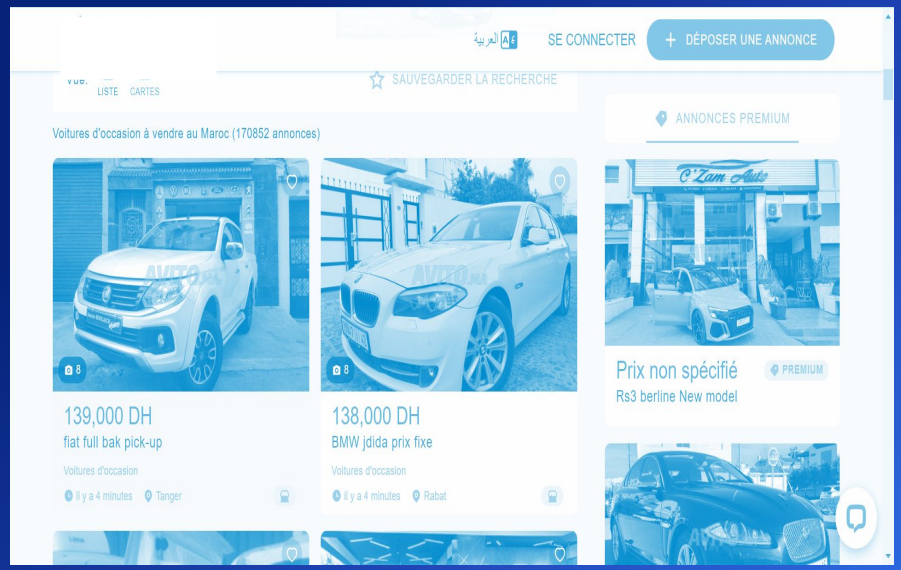
The GUI has been developed in order to allow the client to select specific car brands/models and collect data on demand.

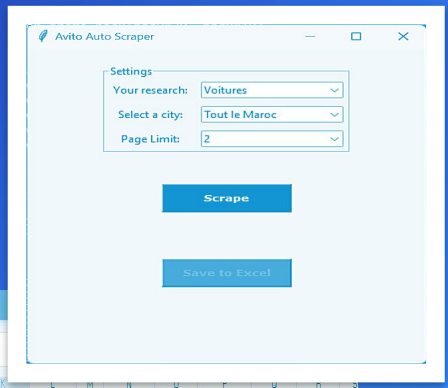
Clean and preprocess the data:

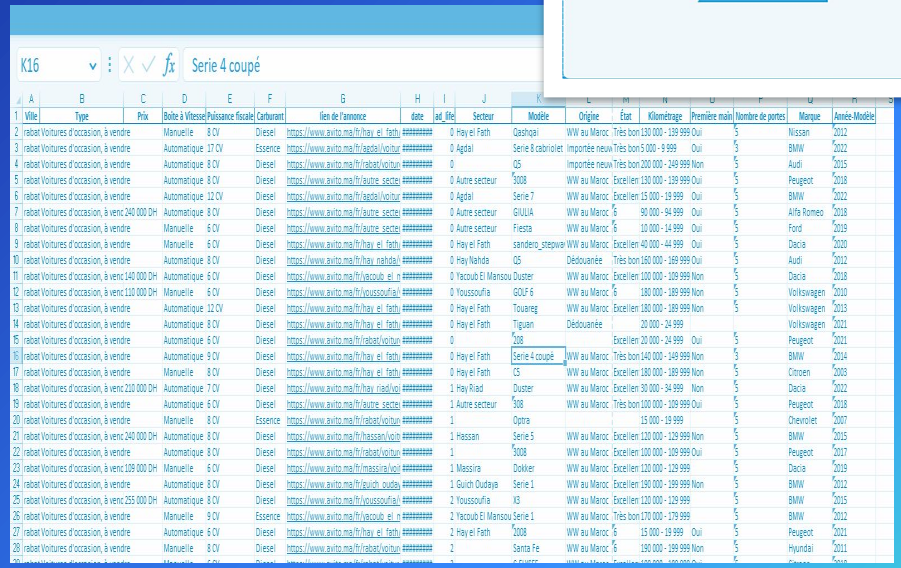
Once the data collected, clean and preprocess is used to ensure its quality and usability. This involves removing duplicates, correcting inconsistencies, and converting data formats.

Allow an easy share of the code

Adding the code in the official repository for Python packages







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Mapping Banking Services: An Analysis of Branch Locations and Demographics

CASE STUDY

Client Challenge

To analyze the banking sector in Casablanca the client needed to visualize the banking network of the major banks of Morocco and to map this network with other demographic data.

The firm was looking for:

- A streamlined and standardized approach for gathering data on banking agency locations, socio-demographic characteristics, and restaurant information.
- Be able to visualize it on a geospatial map. This would enable easy identification and analysis of trends across the different data categories

Our Solution

Infomineo' s Data Analytics team addressed the client's need by:

1. Identifying Necessary Data and Establishing Collection Criteria
2. Use fuzzy – matching to compare data from the different sources
3. Geocode the location data and visualize it on a geospatial map.
4. Compare the agencies' locations with socio-economic & demographic data.

Outcome

- A heatmap of all major banks' branches across the country.
- This heatmap was further enriched by overlaying the city's districts, allowing for easy access to important district-level information such as population and unemployment rate.
- Another map more granular has been developed, offering a more specific and localized view of the city's neighborhoods for the price per square meter.
- Finally for each branch location, an enhanced map with all the relevant data including proxies for traffic signs

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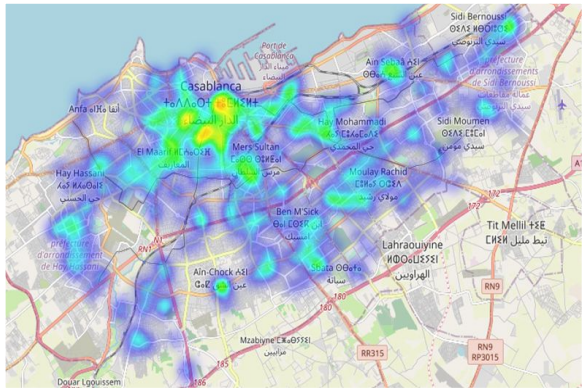
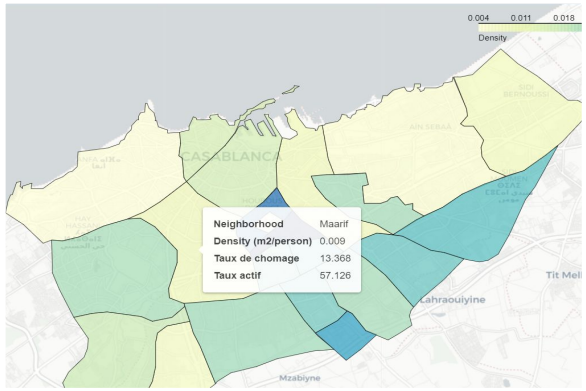
Mapping Banking Services: An Analysis of Branch Locations and Demographics

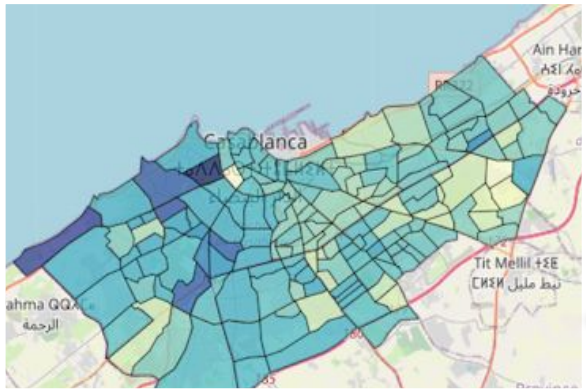
Heatmap of banking agencies in Casablanca



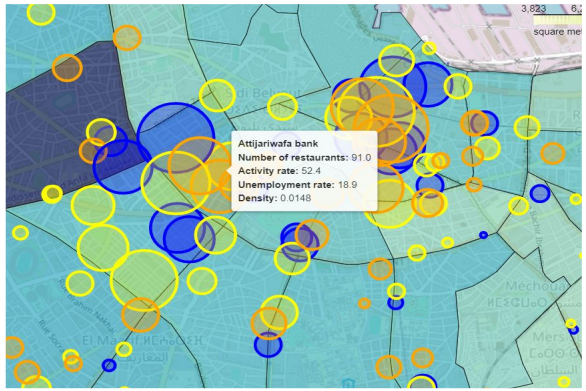
Districts' Socio-demographic data



Neighborhood average price per square meter



Enhanced Map with all information collected



Attijariwafa Bank Banque Populaire Bank of Africa

Methodology

- Branch locations were collected through Google API
- The **Socio-demographic** data is collected from Haut Commissariat au Plan (HCP) website, where the city is divided into **20 districts.** Districts were represented by polygons, and all information is available as GeoJson and GeoDataFrame.
- The city map was divided **into 162 micro zones** to provide a more localized and detailed view of each neighborhood. The **average price per square meter for each micro zone** was calculated by collecting data from the largest "for-sale-by-owner" (FSBO) website, "Mubawab," through web scraping. To aggregate the data, "Mubawab" fuzzy matching was used on the micro zones' names.
- To capture traffic signs two different proxies were developed within each branch's proximity (circles with a 300m radius)
  - **The number of restaurants** was collected using Google API.
  - **The number of built constructions** from the ESA WorldCover program that aims to produce a high-resolution land cover map of the entire Earth's surface.

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