FRACTAL MIND
Enhancing Experiences

GAME-BASED MAPPING OF TOURISM SERVICE OPPORTUNITY

REACH-2020-READYMADE-PLAY&GO_2.2

REACH

THE PLATFORM

GAME-BASED MAPPING OF TOURISM SERVICE OPPORTUNITY

⟶ VISUAL ANALYTICS

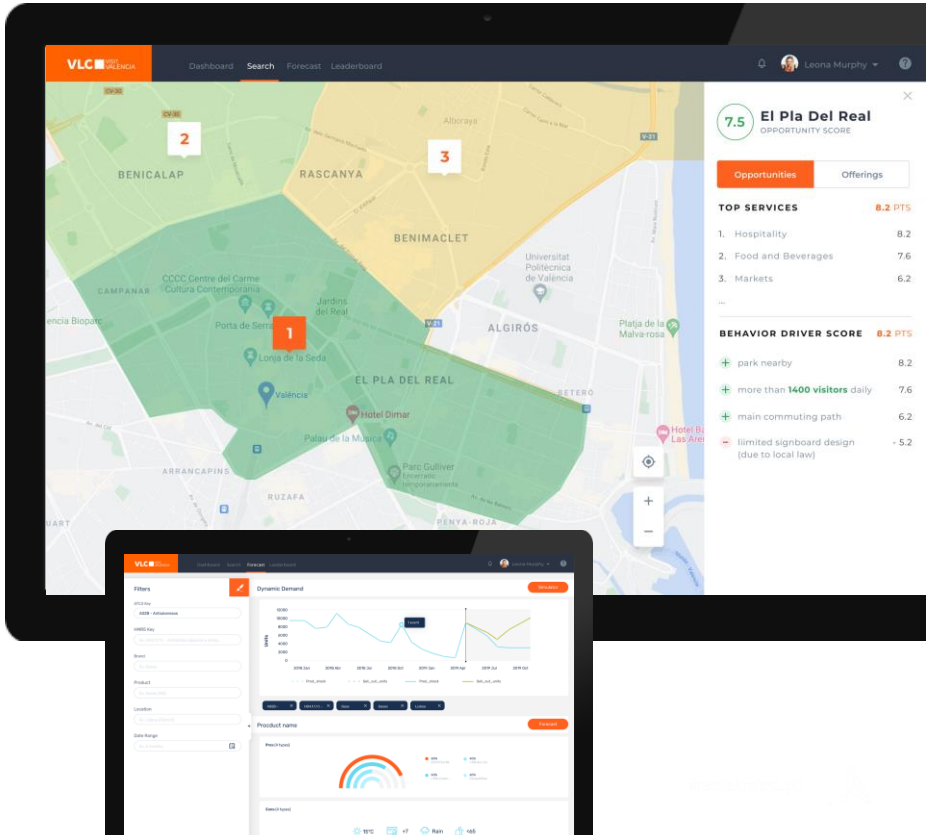
- Web-based for universal use
- Provide human relevance from data
- Network potential for resilient service offering

⟶ DYNAMIC SERVICE FORECASTING

- Accurate forecasting with multiple data sources (tourist footfall, demographics, meteorological, etc)
- Detailed forecast drivers based on tourist behavior
- Real-time simulation of business scenarios

⟶ GAME-INSPIRED UX/UI

- Game design visual guidelines to maximize usability and engagement
- Present real time added value - snapshot
- Enable holistic “big picture” analysis



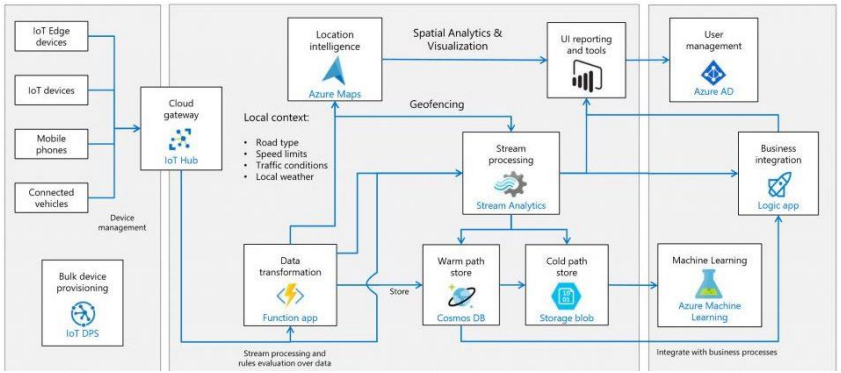
DATA FLOW AND TRANSFORMATION

INPUT DATA

Play&go experience

- Geo spatial data
- Socio and economic
- Weather forecasts
- Arrivals & departures
- Tourist expenditure
- Local service offerings
- ...

DATA PROCESSING



A version of this preliminary data pipeline, will be adopted pending on availability, accessibility and relevance of data from Provider and Municipality of Valencia

OUTPUT DATA

- Tourist Profiling
- Points of Interest, fluxes and densities
- Tourist Demand Analysis
- Service Opportunity Scoring
- Geo spatial Supply Simulations

THE TECH

TECH ARQUITECTURE

INPUT DATA

Play&go experience

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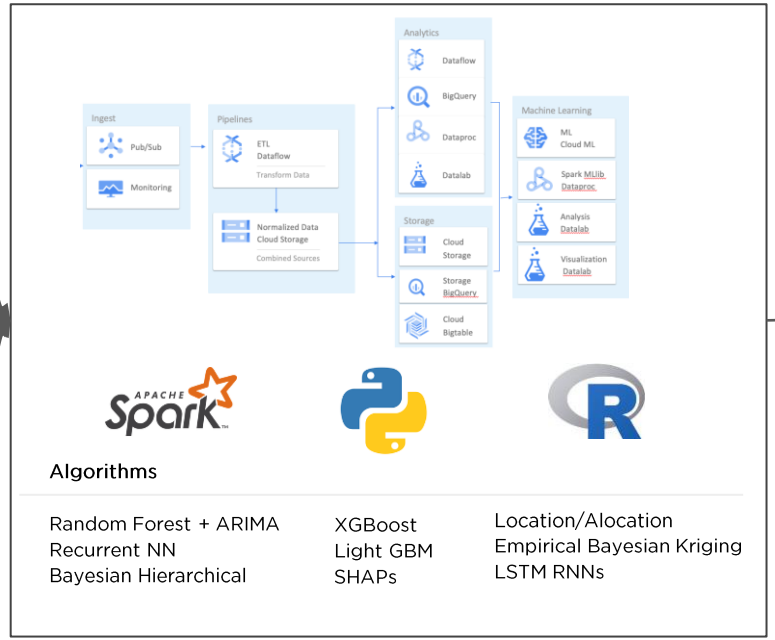
DATA PROCESSING & MODELING



DATA PRODUCTS

- PRIVATE API
- ANALYTICAL MODELS
- PUBLIC API

HASHING + TWO-FACTOR AUTHENTICATION + SSO

PRESENTATION LAYER

- Points of Interest, fluxes and densities
- Tourist Profiling
- Tourist Demand Analysis
- Service Opportunity Scoring
- Geo spatial Supply Simulations

DIRECT ACCESS

- TOURISM BOUREAU WEB DASHBOARD
- REPORTS
- EXTERNAL API
- DATA EXPORT

DATA ACCESS

THE TECH

ALGORITHMS AND TOOLS

DATA PRE-PROCESSING

- Geospatial polygon attribution
- Route stream aggregation
- Geospatial density
- Time based density flows

DATA ENRICHMENT

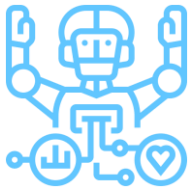
- Contextual datasets: geo spatial data, socio economic information, weather forecasts, tourist arrivals, departures and expenditure, existing service offerings.

TRAINING AND VALIDATION

- Empirical Bayesian Kringing and Location-Allocation
- Random Forests, ARIMAs, Recurrent Neural Networks, Bayesian Hierarchical, XGBoost and LightGBM.

FORECAST DRIVERS

- XGBoost family is fast, scalable and low on error, both for prediction and variable explainability.
- Bayesian optimization for hyper parametrization.



SIMULATION & CROSS EFFECTS

- Point of interest cross effects modeled using Long Short-Term Memory recurrent neural networks, as well as through nearest neighbor dissimilarity
- Variable contribution to attractiveness (geospatial, characteristics, group behavior)

RESULT

- Micro segments of tourists and their preferences.
- Forecast service demand with low uncertainty.
- Understand tourist behavior drivers.
- Simulate alternative service offering and estimate impact.

THE TECH

SCALABILITY AND FLEXIBILITY

NEXT ITERATION

- Fully functional data pipeline
- Ready for localized data
- Refresh model training

STREAMLINE DATA PROCESSING

- Automate data transition layer (cleaning and enrichment)
- Near plug and play

NEW GEOGRAPHIES

- Replace contextual datasets in existing data pipeline
- Refresh model training

SCALABLE INFRASTRUCTURE

- Testing different cloud infrastructures (Google Cloud and AWS)
- On demand scale is required

DATA SECURITY AND LEGAL COMPLIANCE

ACCESS TO DATA

- Web access uses HTTPS and requires password hashing
- Will include 2 step authentication and single sign-on.

IdAM FRAMEWORK

- Baseline implementation with room for customization

SECURITY ON DATA TRANSACTIONS

- All data is encrypted, while rested and in transit.
- Communications between systems requires SSL/TLS.

DATA OWNERSHIP & GDPR

- Proprietary datasets will always require GDPR compliance assurance by data providers.
- Working towards ISO 27001 certification

QUALITY ASSURANCE AND RISK MANAGEMENT

QUALITY ASSURANCE

CHALLENGES

- Challenges during integration due to different sources and levels of granularity
- Municipality data
- Scraping for data enrichment of points of interest, commerce and hospitality

STRATEGIES

- Four hands programming approach.
- Heuristic validation of locale to data.
- New features to accommodate tourist's fluxes, time demand, length of stay, cross effects of points of interest.

RISK MANAGEMENT

- User data already anonymized by data provider
- Point of interest validation and enrichment through different sources (municipality vs provider vs google maps)
- Point of interest clustering and association. Nearest neighbor dissimilarity

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TRIBE GLOBAL

Thanks!