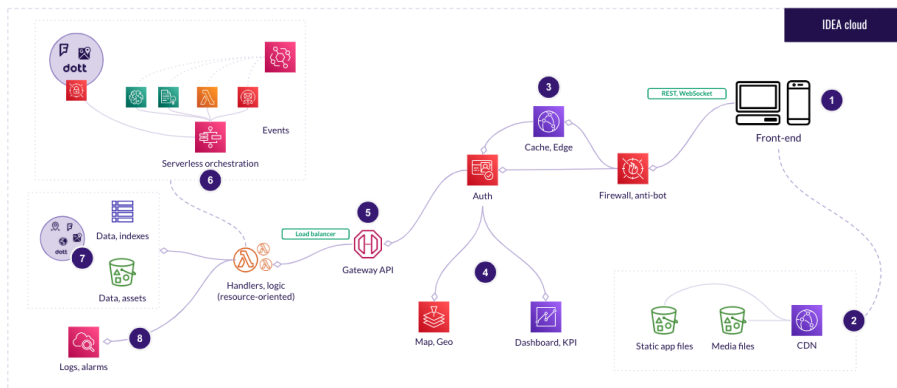


Technical Specification Double-side Page

- 1. TECHNICAL SCOPE:** Summarize the solution developed during the EXPERIMENT phase: how have you finally addressed the challenge/Theme Challenges and tackled with its requirements and data. Include a diagram.

We built a trusted, easy-to-use tool for Data providers (Play&Go Experience and Dott) to exchange data with our platform. This procedure can ingest data from Excel spreadsheets, S3 Buckets and APIs via end-to-end secured connections. During the upload, the data from the AR city tours and mobility promotions, are uniquely identified with Foursquare and Google's APIs. We used location coordinates from ESRI, approximate range from Foursquare API, and fuzzy strings search to match the exact locations in different databases. Our data model is built by a combination of the most complete information from this pool of databases. As a result, we achieved the incredible 95% correct resolution of the total data from Play&Go.

Plus, the POInt&Go Base subscription enables Data Provider to retrieve up to five Google comments for POI, the Premium one up to 1000 comments. During the data processing,



POInt&Go analyses comments from each source with a robust NLP algorithm with multi-language support. This functionality is essential since a considerable percentage of Play&Go's comments are in the Catalan language, a dialect that general-purpose models do not always recognise. These techniques have been used over the **10k Virtual Reality impressions collected annually by Play&Go Experience**. The MVP uses data anonymisation and machine learning techniques on Dott's data. The company shares with POInt&Go statistics on promotional agreements with their customers. Such information may include contact details, emails or company client locations from over 15 international destinations. Geo-location and anonymization techniques have been used to map the density and effectiveness of their promotions without revealing sensitive information to third parties. The entire architecture is built with a cloud-native, serverless approach. **Amazon Web Services, earlier in June, agreed with ITER IDEA 30,000 € to support POInt&Go development.**

- 2. ALGORITHMS, TOOLS AND CONCLUSIONS:** Detail the algorithms and tools finally selected to accomplish the challenge/Theme Challenges. Summarize the main results that you have obtained during the EXPERIMENT phase: data, insights, conclusions and the main contributions to solve the challenge/Theme Challenges.

- Event-driven microservices and serverless orchestration. Even for computationally intensive operations, such as massive data import, via asynchronous lambda functions. This enabled us to meet sustainability and Carbon Footprints limits.
- Location technology. We successfully adopted mixed strategies to resolve over 95% of POIs resolution, harmonising features from Foursquare and Google API, ESRI, and fuzzy search.
- Anonymisation techniques: We adopted location technologies to anonymise potential sensitive information when sharing it with stakeholders. This makes it impossible to recover the original data, but with the ability to not lose location info.
- AI-enhanced processing. Insights, when facing the entire dataset, we experienced a different kind of data: misspelt, expressed in dialect (e.g. ~20% were in Catalan), Mixed sentiment (e.g. two separate entities in the same sentence with opposite emotion). This nature requires continuous monitoring of the performance (and accuracy), favouring more robust pre-trained systems to avoid model deterioration and decrease in accuracy over time. For such a challenge, we involved features from Amazon Comprehend, such as NLP multi-lingual targeted sentiment support and Entity Recognition, to run both on Play&Go Experience's and social platform's comments.
- Clustering techniques: We used clustering algorithms to reconstruct the most frequent tracks identified by users during the experiences promoted by Play&Go Experience.

3. **SCALABILITY AND FLEXIBILITY OF THE SOLUTION:** Explain how the solution copes with the challenge/Theme Challenges requirements and how can it be adapted to other similar problems. What work is still pending to create a real/stable product if any? What TRL level is it in?

The solution can integrate data sources and new providers with a few lines of code. The solution defines the related widgets and KPIs for each provider and makes them smoothly reusable. In this MVP, the following KPIs have been created:

- Number of check-ins and comments, sentiment analysis pie charts.
- Foursquare and Google, number of comments and sentiment analysis pie-chart.
- Relevance of the POIs
- Perception Variance between induced perceptions and social ones.
- Performance of the Play&Go Experience's apps on popular and unpopular POIs.
- Track Analysis: most appreciated tracks,
- Events comparisons on each KPI.
- Number of promotions active in the areas.
- Number of redeemed promotional codes.

All of these metrics above are now available for other providers to adopt. Given the city-based data providers, we already reach 16 cities. When adding a new city, it will be enough for them to simply upload a new dataset to populate all points of interest and recalculate their widgets. Speaking about scalability, the same metrics developed for the first two Data Providers are available to other competitors who may not be present in certain cities. In these circumstances, the entry obstacles for these new adopters will be reduced, allowing us to reach new cities. Finally, the app has been translated into Spanish, Italian and English to meet the needs of the first partners.

The product will fully-integrate monitor systems, such as access logs ("log trail" for governance and auditing) or decentralised ledger, to make the number of accesses a set of measurable KPIs to satisfy our future roadmap. By now, we have identified technology and products at TRL5.

4. **DATA GOVERNANCE AND LEGAL COMPLIANCE:** Describe the security level of the solution, i.e. how authentication, authorization policies, encryption or other approaches are used to keep data secure. Explain how the solution is compliant with the current data legislations concerning security and privacy (e.g. GDPR).

POInt&Go is built on several international compliances for risk, security, quality, PII management, etc.: SOC 1/ISAE 3402, SOC 2, SOC 3- FISMA, DIACAP, and FedRAMP - PCI DSS - ISO 9001, ISO 27001, ISO 27017, ISO 27018 - GDPR, FIPS 140-2, and NIST 800-171. Several cloud services have been adopted to maximise security and reliability: such as web firewalls and Secrets Managers to automatically-rotating cryptographic keys and secrets. Each architectural component is built with a least-privilege permissions approach, and the whole flow is monitored with certified auditing tools. Users authenticate securely tested through our service built on Amazon Cognito; their data is stored in modular regions of the AWS cloud in Europe. The app collects only names and emails to guarantee login functionalities; none of this information is used for tracking purposes. No other data processed within the platform is subject to the law of the GDPR Regulation for individuals or companies in Europe. Users have the built-in functionalities to delete their profile and any data. POInt&Go provides encryption in transit and at rest, and dependency-graph automated mechanisms to identify source code and libraries' security risks.

5. **QUALITY ASSURANCE AND RISK MANAGEMENT:** Describe the quality process followed for the final product. Technologically, which problems have you encountered and how you have solved them, and any processes followed that guarantee that the solution fulfills the challenge/Theme Challenges and data provider requirements.

Building on a standard ISO 31000-like approach to risk management, we take a further step with distinctive frameworks that guide the creation of excellent solutions in the cloud. Specifically, we chose the AWS Well-Architected tool to continuously improve the design and development under six pillars: operational excellence, security, reliability, performance efficiency, cost optimisation, and sustainability. Moreover, during the development phase, we managed the project using Agile methodologies and Scrum Framework (weekly Sprint), with strict unit-testing and acceptance criteria. We have had periodic touchpoints with Data Providers to showcase deliverables. These meetings were crucial to design added value features such as Track analysis for Play&Go or specific Widgets on Promotional codes during events, to make the platform more attractive to use in the long term. To increase our possibilities, we conducted interviews with some municipalities and also included their feedback in the roadmap. One technical challenge we faced was the customers' data anonymisation we acquired from data providers streaming data. Specifically, the data useful for the correct positioning of the POI also contained potentially sensitive information on the customer and the partner. We used the AWS Location Service and Foursquare API to approximate the location and randomise the recognition of information. Another significant challenge was the feature scaling on weight points of interest from heterogeneous data source; crucial aspects in order to correctly weight points in case of missing content or incomplete information.

Annex 1. Means for accessing the MVP

Please, indicate in 1 page indicating the means for accessing the MVP for a potential customer (login information, website address, link to a demo video or whatever means are needed to check that the MVP exists and works).

The platform is reachable via browser at <https://point-go.com/>, a testing user can login with:

- Username: help@iter-idea.com
- Password: thfg%hv2@!xvdfrg

Video [link](#).