



User Insight

Optimize digital experiences and improve conversion rates



**The magnifying glass to read your
customers and prospects.**

NEOSPERIENCE

Empathy In Technology

We design digital solutions for companies that want to grow their business and increase their customers' value, introducing Empathy into Technology,

Technologic evolution is shaped around performance optimization, and has generated significant changes in the relationship between brands and customers, sacrificing the value of individual relationships in favor of efficiency.

In order to re-establish a non-mediated relationship with customers, companies have to change their perspective, including empathy in their relationship and sales processes, both online and offline.

Neosperience is offering a range of ready-to-use solutions, to help offering targeted experiences to each customer. This way you can get to know and localize your clients, increasing your brand value and sales margins.

In February 2019, Neosperience has been listed in the Italian Stock Exchange. Neosperience technology allowed to develop several start-ups, renowned for their innovation potential in each one of their fields.

Everyday our professionals work to blend technology with empathy, merging dream, form and use function, to benefit all of our customers.

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USER INSIGHT

Personalized experiences for your customers with AI, across all of your digital touch-points

The enormous amount of information and commercial communications people receive everyday, and the consequent decrease of the “attention span”, make it essential to learn how to catalyze customers interest using personalized offers and experiences.

The Solution

Thanks to User Insight you can collect and analyze data about user browsing behaviors on your website or App, using the most advanced Artificial Intelligence and Machine Learning techniques.

Moreover, you can obtain relevant information about the characteristics of each user, including psychographic traits such as interests, preferences and personality.

This kind of one-to-one acquaintance allows you to increase conversion rates and lower the abandon rates, by providing a customized communication in your website and other digital touch-points, such as newsletters, apps and conversational interfaces (chatbots), with targeted messages based on each user’s needs and unique characteristics.

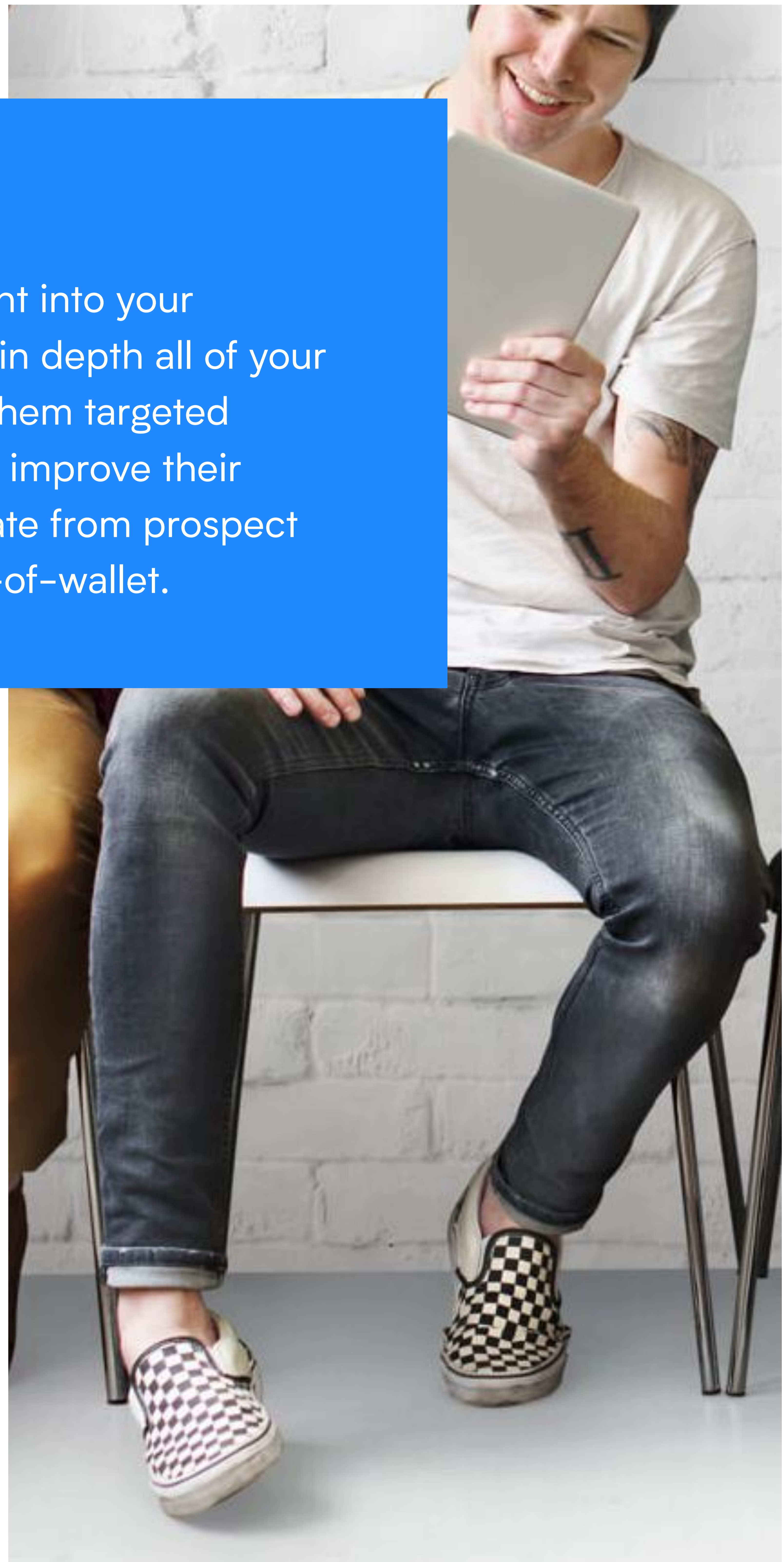
UNIQUE VALUE

User Insight

By easily integrating User Insight into your website or app, you can know in depth all of your customers and users, to offer them targeted products and experiences and improve their engagement and conversion rate from prospect to customer, beside the share-of-wallet.

Competitive advantages

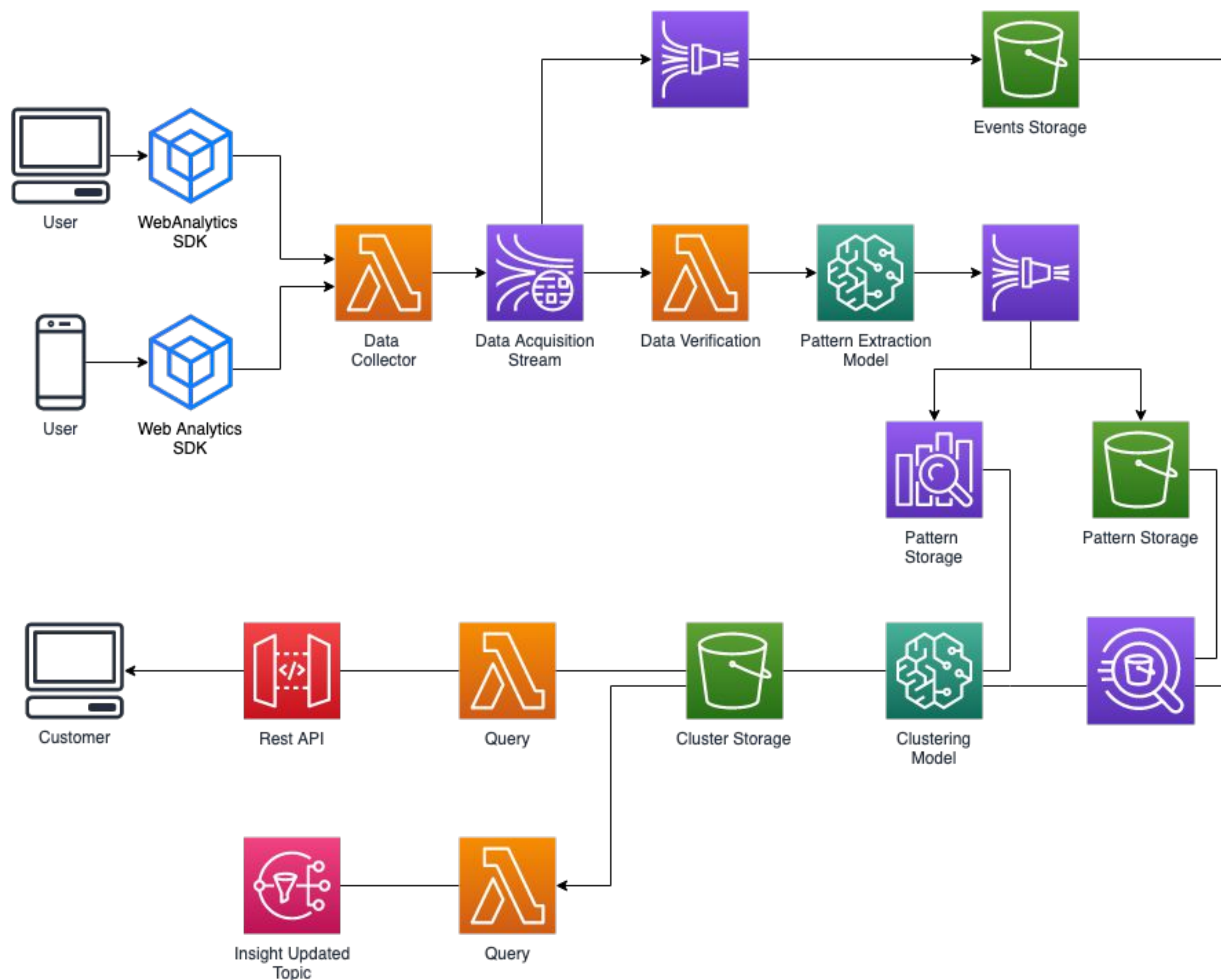
Thanks to User Insight you can analyze all your users interactions and behaviors using Advanced Analytics and Machine Learning techniques. This way, you can obtain and use precious “qualitative” information in real time: not only the preferences about product and content categories, but also inclinations, interests and personality traits that determine choices and purchasing behaviors.



Data Sheet

SOLUTION ARCHITECTURE

User Insight allows to obtain raw data about scrolling and click/tap events happening inside your website or app, and use advanced machine learning models to identify every user's unique behavioral characteristics and psychographic traits.



The founding principle of the Solution, scientifically validated, is the existence of a correlation between the different browsing styles of a digital touchpoint and the users' needs, intentions and personalities. For example, people who prefer to get informed and go into details before making a decision (“high need for cognition”), will browse an e-commerce portal differently than those who decide impulsively or on the basis of a few fundamental elements.

The Solution uses the Behavior feature of Neosperience Cloud, which aims to collect click and scroll events during a user session, using a library installed inside the client touch-point.

These data are aggregated by a backend service and are analyzed by Neosperience Cloud machine learning models.

Client Library

The analysis calculated by User Insight's machine learning models need a data flow associated to the user and related to the click and scroll events. The monitoring of these events takes place similarly to the analytics systems, and needs to include a library, provided by Neosperience, in the digital touchpoint, in order to allow the monitoring.

It is a simple JavaScript library that uses the browser's features to monitor relevant events happening on that page and the related context, in order to send them to the backend.

The integration of this component is an operation that can be carried out easily and autonomously. The library may optionally be included through tag management systems (i.e. Google Tag. Manager).

Data acquisition services

User Insight enables data streams for the acquisition of events transmitted by the users' browsers which are related to the click and scroll actions. These events are issued independently by the client library, which keeps the Document Object Model (DOM) of the page monitored, and generates JSON fragments in the background, sent by a worker to the Neosperience Cloud backend services. The "Interaction" feature used inside the Solution allows to acquire data through a REST endpoint, thus providing a standard interface towards potential clients.

The events are directly augmented on the stream through an ad hoc query by Kinesis Data Analytics (KDA), which allows to generate events with a lower frequency rate, aggregating data sets on a case-by-case basis.

For example, when the client generates a stream containing the "scroll" events on the page with start and end coordinates, such data are stored in a stream and consumed by KDA in real time, applying a mobile window to carry out counting and gathering operations. The result of such elaboration is sent to a new stream containing the overall scroll events within a few second, thus allowing to identify the actual "reading" operation on that page (think about a user scrolling a text while reading its content).

Both these initial processings and raw data are serialized through Kinesis Firehose inside a S3 Bucket that acts as a storage and a source of truth. The data stream is consumed by a lambda function which elaborates data in batch, sending them to the machine learning model Managed by Amazon SageMaker.

Such model applies a properly trained neural network to extract patterns from a series of historical data - sequences determined by a certain typology - and sends the results to a S3 for backup purposes and to an ElasticSearch cluster to make them available for the following analysis phase.

Clustering algorithms – powered both by the data included inside ElasticSearch and by the query result carried out by Athena on the long term archive of the examined patterns – gather the browsing patterns into clusters, based on similarity logics.

Using ElasticSearch allows a response by the system within a few seconds, which is essential to guarantee an initial profiling of the user; whereas the execution of the query analysis on the cross-user patterns (through Athena) allows to refine the information provided in input to the user profile classification model within multiple sessions. Where necessary, it's possible (on a project basis) to provide to the model also metric sources not related to the browsing (such as the results of the third parties business intelligence systems analysis or other machine learning models), allowing the processing of personalized customer profiles.

The insights extracted by the machine learning models are delivered to the library as feedback push (through websocket) and provided to the Customer Neosperience Cloud's management layer, beside being sent to a SNS topic to be easily integrated with third parties systems.

TECHNOLOGY USED

User Insight uses specific technologies to stream manage the data on browsing behaviors, and to carry out the proper data clearing and data augmentation operations. The solution consists of a range of services and a client library for data acquisition and processing.

Client Web

The client library is developed in JavaScript. Even though the core of the project uses the ES7 specifics, the output is filled out using Webpack and Babel, in order to produce a library compatible with all the modern browser. In particular, the library is optimized to take maximum advantage from the IE Edge functions and from the latest versions of Safari, Chrome and Firefox.

Since the library uses the browser's worker to send data in the background without interfering with the user experience, the specific gathering mechanisms previously described maximize the probability to deliver data packages to the backend. In case the connection is intermittent or particularly weak, the browser could autonomously drop some of the packages.

Services

The service component of User Insight uses the Neosperience Cloud Iteration function, inheriting the best practices and infrastructural services, beside the Neosperience Cloud deploy logics. Services are developed. With Serverless technologies on NodeJS stack and benefit from the AWS Lambda and APIGateway support, to guarantee the accesses' safety and scalability.

The Machine Learning models used to build the browsing patterns and their classification, for example according to psychographic metrics, use Amazon SageMaker and the related Docker containers for the deploy in production and the endpoints scalability. The used framework is Tensorflow + Keras to build the neural networks, whereas XGBoost and Means are used as models to classify and cluster the patterns.

The orchestration of the different components is executed through the use of AWS Step Functions. The User Insight Solution is provided as a SaaS service, therefore, such logics are disguised by the REST endpoints exposed by the platform.

SAFETY AND DATA PROCESSING

The data managed by User Insight don't have special reservation requirements, as they don't allow the identification of the user in any way.

Moreover, the system does not memorize any sensitive information about the user (including the IP address of the client), in compliance with the GDPR. A session ID is assigned to each user and properly saved in the browser's local storage, being reassigned at every following session. There is no guarantee about the re-identification of the users between different sessions, as the user could delete the cache and the storage, eliminating the id configured by the library.

The generated ID is univocal to the session and the specific browser, therefore, does not allow any cross-identification of the users, so that the compliance with the regulations is guaranteed.

The data are sent with an encrypted connection and are memorized inside persistency systems which are in turn encrypted inside the AWS Cloud.

INTEGRATIONS WITH THIRD PARTIES

Following the Neosperience Cloud API-first, User insight is easily integrable with third parties systems such as SaaS service, safely used thanks to the strong OAuth2 authentication.

The support for the authentication according to the Basic Authentication workflow allows to use the machine-to-machine credentials, specially suited when the client is a web service instead of a console client (i.e. Web).