Quinnox
accelerate success

Digital Transformation to Digital RE-INVENTION

in the fragrance industry

What’s happening in the fragrance world?

Industry Overview

Market Size

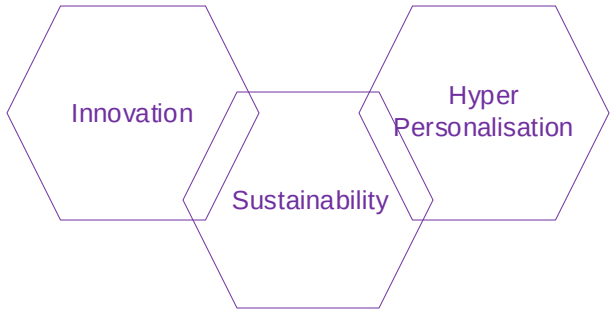
The global fragrance and perfume market size was estimated at USD 61.79 billion in 2023, with a projected growth to USD 84.02 billion by 2028 at a CAGR of 6.34%.

Product Line

Spans across personal care, cosmetics, household products, and various industries.

Essential component in beauty and personal care products, contributing to personal hygiene, confidence, and individuality.

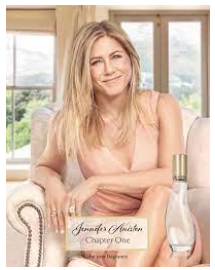
Value Chain Drivers



From Raw Materials Sourcing to Global Distribution

Market Dynamics

Celebrity endorsements, product advertising, and social media trends entice consumers to choose from different variants of fragrances.



Challenges

- Brand counterfeiting
- Stricter regulatory standards for product safety, labeling compliance, and environmental considerations

Outlook

- Expected increase in demand due to expanding distribution network, e-commerce penetration, and rising demand for high-quality products.
- Technology driven innovation positively impact growth
- Generational attributes driving differentiation

Market Watch

Focus on Sustainability

Industry aligning with sustainable initiatives emphasizing eco-friendly packaging and ethically sourced ingredients.

Global Presence

- Asia-Pacific, particularly China, emerging as the fastest-growing market with increasing demand for luxury perfumes.
- Expanding distribution networks and penetration of e-commerce retail driving global reach.

Innovation & Technology

- Ongoing research & development for novel fragrance formulations.
- Integration of technology, such as neuroscience-driven scent recommendations with science backed notes that target stress becoming a new purchase entry point. This will unveil personalized and functional performance with scent.

Next-Gen Sustainability

The sustainable fragrance space will grow as advancements in biotech emerge and drive innovation in ingredients.

Fragrance in the Metaverse

Fragrance goes phygital, from scent profiles that imagine how the internet smells to creating online worlds that link to individual fragrances, merging the digital and physical realms.

Gen AI, Robotic Process Automations, Internet of Things (IoT) etc.

Hyper Personalisation for the Experiential Generation

“Fragrances have the power to evoke memories, emotions and enhance our moods”

- Gen Z can see right through inauthentic products. Having them actively involved in the creation of fragrance is essential.
- Being transparent about ingredients and creating fragrances that provide value while remaining authentic is very important to them.
- They prefer to have a ‘fragrance wardrobe’ as opposed to a single signature scent.
- Their desire to curate a cohesive fragrance assortment has fueled the rise of #PerfumeTok.

Briefs inspired by the latest millennial trends

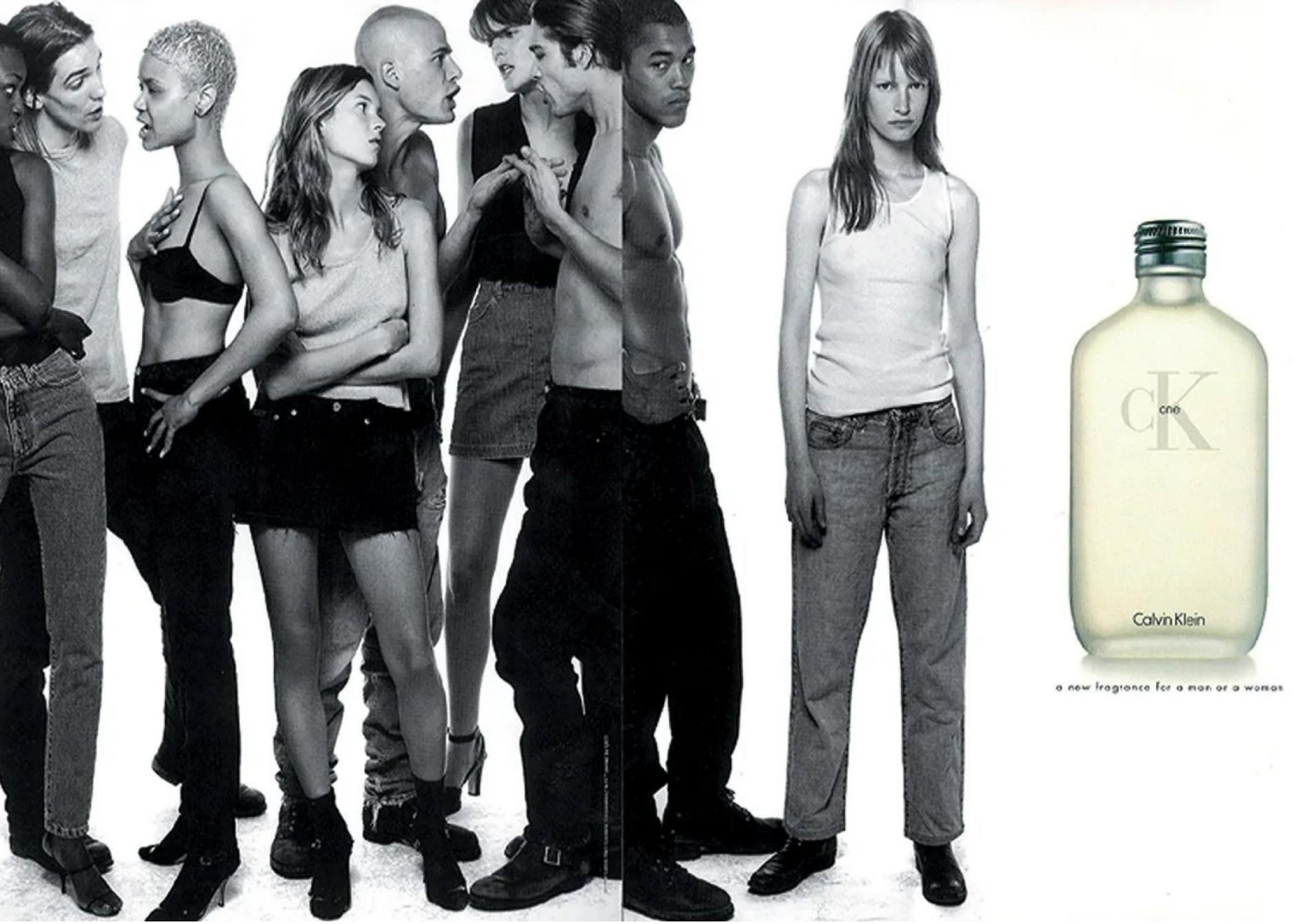
“Iredale Eau de Parfum” Inspired by the wreckage of the Peter Iredale on the shores of the Pacific Northwest, the essence of smoldering driftwood intermingles with notes of surf and sea

Scent temporarily transports you somewhere new or allows you to seek comfort in nostalgia.

Gen Z and the rise of gender-neutral fragrances

"Unisex fragrances are popular with consumers who care about expressing their individual personality through their fragrance, They don't want to be assigned a standard fragrance based on their gender, but would rather find a scent with unique personal appeal."

– Eleanor Dwyer, US beauty and fashion research associate at market research company Euromonitor International.



Unisex fragrances

in 2021 there was a 176 per cent increase in online discussion of gender-neutral fragrances.

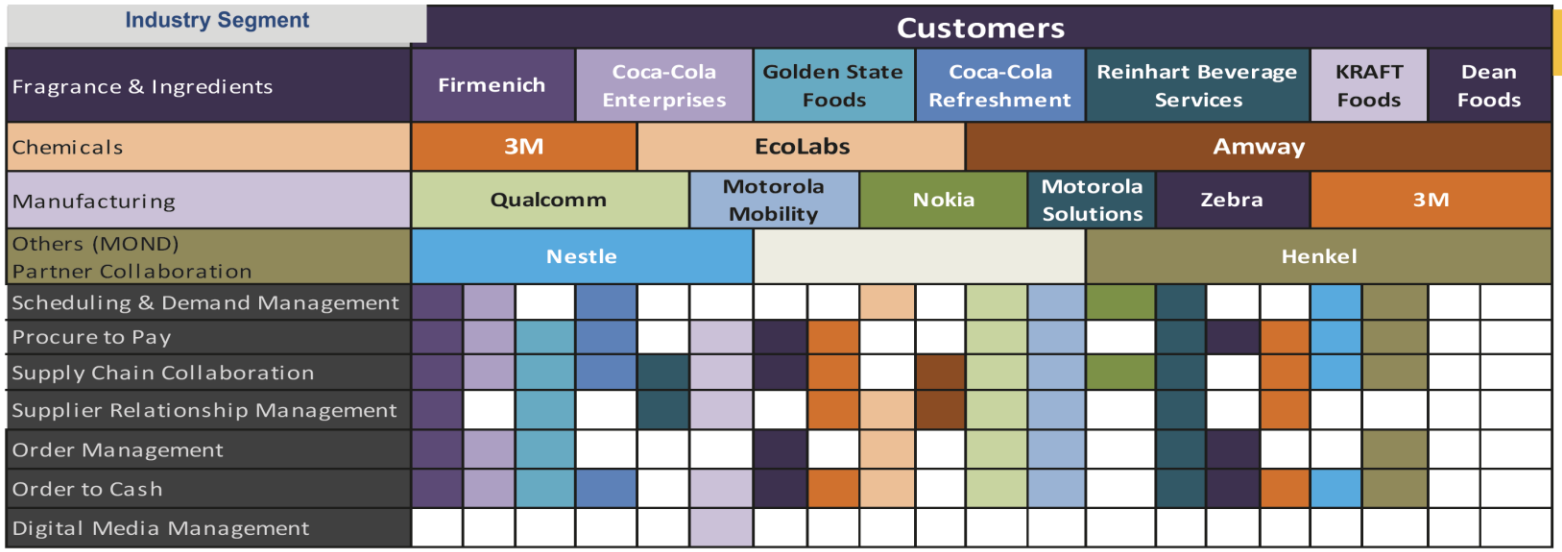
That number keeps growing, and as a consequence the fragrance industry is starting to offer a catalogue of smells that focuses more on scents' personality than gender roles.

New Generations and Labels

“People no longer want to be labelled, whether it’s gender, age or ethnicity, and instead want to be recognised for their individual wants and taste,”

Quinnox Expertise and Experience in Similar Domain

Vertical Domain Expertise



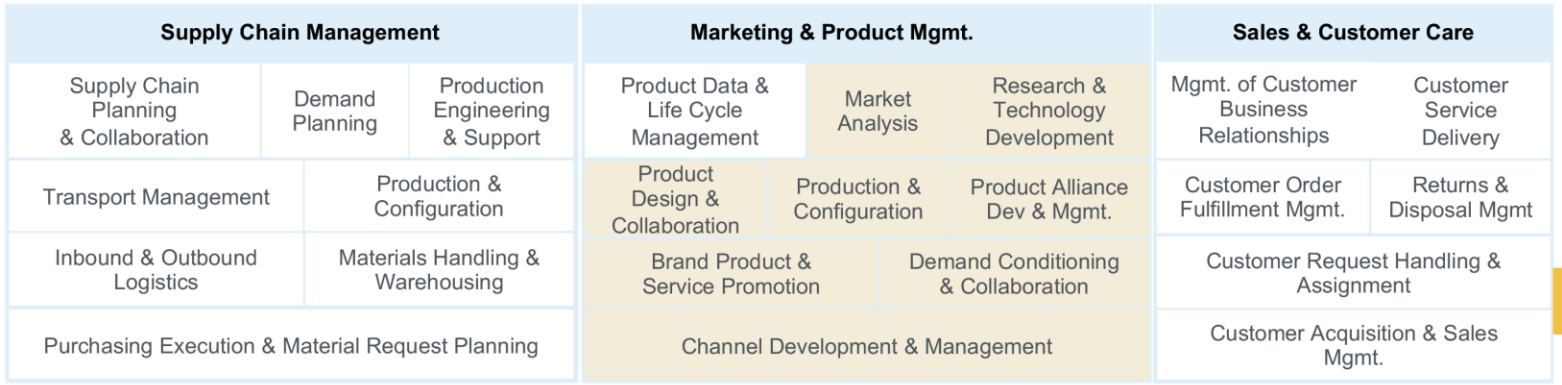


Figure 1

Quinnox is organised by Verticals, and has developed technical and domain expertise in various business functions that **directly impact CPL Aromas operations.**

Figure 1 discusses industry segments and Value Chains (B2B etc.) where Quinnox brings expertise (colour coded to match clients, segments and core processes) through the Solution Architect Group (SAG), Delivery and operational members who will be deployed to the Factory.

Key members assigned to the engagements have worked on projects that include Order to Cash, Procure to Pay, Supply Chain and other core processes.

Figure 2

Figure 2 highlights additional examples from an Enterprise Architecture standpoint.

Quinnox has experience in Fragrances, Food and Ingredients, Manufacturing and core operational processes **and this expertise**

Digital Re-invention and Technology Integration

Recombining Natural and Artificial Intelligence

The Rise of AI and Data-Driven Perfumery

Industry's commitment to digital transformation, innovation, and meeting evolving consumer demands.

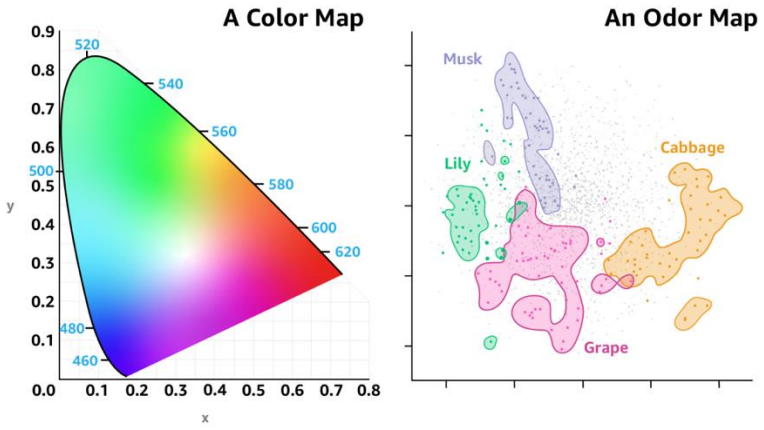
Generative AI (Gen AI) as a tool for R&D will radically disrupt how you investigate and invest in new classes of fragrances and broaden your research to find more novel candidates for your regulated trials and evolving customer segments.

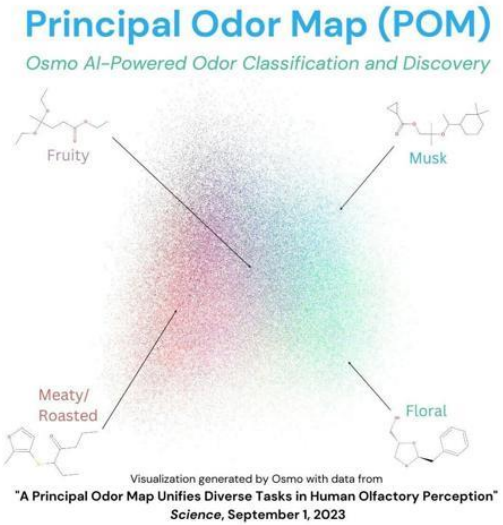
Generative AI models improve the process of identifying novel, patentable molecules and formulations with desirable properties.	Training GenAI models on large datasets of chemical structures and their associated properties allow the models to learn patterns and generate new molecules with similar characteristics	Discriminative & Generative AI helps ‘Patent extension’ of established fragrances nearing the public domain	Reduced cost to innovate and increased trial pipelines

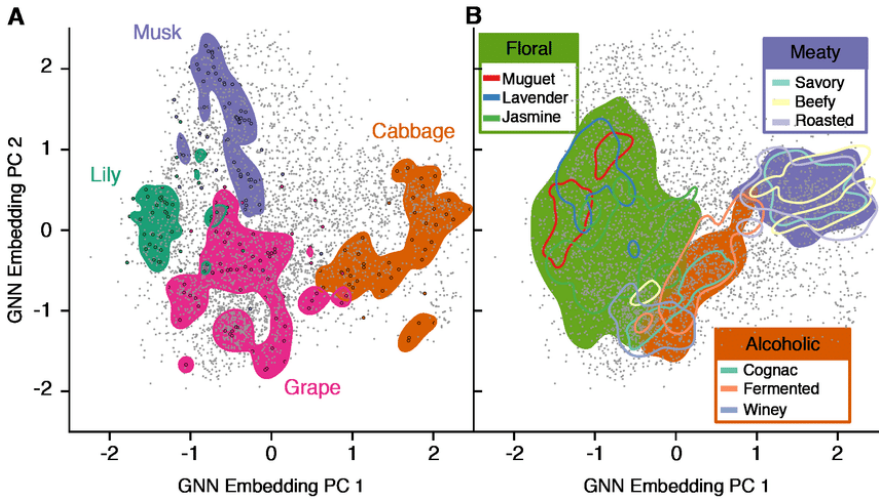
Digital Re-invention – Competition Check

osmo *by Google*

Digital Mapping of Scents based on molecular structures







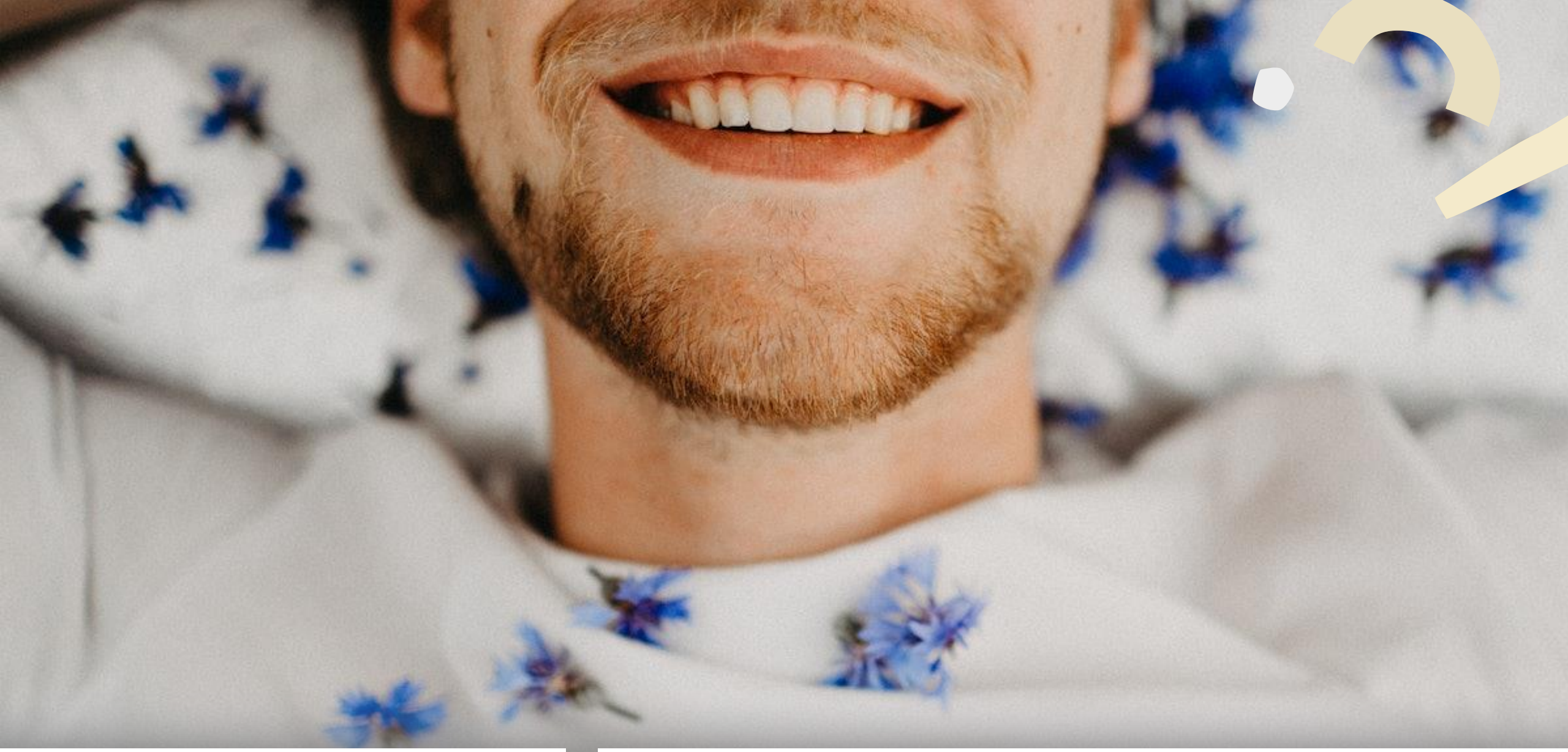
Using graph neural networks (GNN), Osmo CEO Alex Wiltschko and his team created a principal odor map (POM), the first generalized odor map of its kind that can outperform people at scent prediction. Their machine-learning model, which was trained on a dataset of 5,000 molecules, predicted the scent of hundreds of molecules that had never been smelled before, based solely on molecular structure.

Osmo has created a powerful platform that accelerates the search through the billions of molecules in chemical space to predict the scent of any molecule that exists or is manufactured.

Goal 01	**Lead the discovery of new scent ingredients that are safe, sustainable, and environmentally friendly.**
Goal 02	**Create digital representations of smell that will change how we capture, transmit and remember scents.**

Givaudan MYRISSI

Myrissi, part of Givaudan’s 2025 strategy, captures and predicts consumers' emotional perception of fragrance. Based on a decade of academic research in brain imagery and AI, it aligns colors, emotions, and scents for an enhanced fragrance experience.



Givaudan

Well&Be

By pushing the boundaries of wellbeing understanding through renowned mood technologies and the principle of sensorial congruence, **Well&Be** helps define outstanding emotional product experiences for consumers, powered by fragrance, together with other product features, such as packaging colour.

Neuroscientific Investigation Program

Designed to scientifically evaluate the impact of fragrance on human psychology and physiology, Wavemotion will unveil insights into how scent can influence positive neural responses to transform the emotional landscape of consumers and elevate consumer wellbeing.

Utilising multi-dimensional, sophisticated neuroscientific techniques and physiological practices, Wavemotion will explore the processing of odour signals within interconnected structures of the brain, which are essential in determining emotional states before we even recognise the scent.

Digital Fragrance Creation Tool

- Vita assists perfumers in developing natural fragrances according to ISO16128 standards, enhancing naturality data transparency.
- Accelerates the process, allowing for a more nature-conscious ingredient selection.

Firmenich | ADS
Accurate Dosing Systems

The high-tech robot is designed to automate the process of accurately measuring out hundreds of flavouring solutions, which go on to determine the taste profile of food and beverages. By offering the specialized dosing technology, allowing scent and flavour formulas to be compounded on the machine in minutes instead of hours, it outperforms competitors still using gravimetric or volumetric dosing.

moodify

AI-based ‘white noise for your nose’ that cancels surrounding malodours

- Moodify AI-based algorithms easily generate malodour formulas that are said to outperform the best malodour control benchmarks created by any other supplier when introduced to the human nose, eliminating the perception of bad smells.
- The advanced algorithm selects the best combination of odour neutralisers, creating a customised formula that perfectly matches the target customer’s malodour requirements.
- The final formula has the concentration of components needed to obtain the expected effect, and the material amounts can be updated during the optimisation of the composition. Regulatory limitations and price considerations are also considered to ensure that customers get the most cost-effective and efficient solution.

The Scent NFT project is aimed at transforming the way humans perceive and interact with scents by digitizing scents and **making them accessible through a digital platform.** Has use cases in transparent supply chains, anti-counterfeiting measures and efficient agreements.

- In this digital marketplace for scents, users can purchase and experience scents through a unique system. The core of the process lies in the “diffuser”. The “diffuser” is a physical device that functions like a printer where a specific aroma is created from a combination of different aromas released from a scent NFT
- Scents are represented as non-fungible tokens (NFTs), allowing users to own and experience scents digitally. By scanning the NFT with a smartphone, users can trigger the diffuser to emit the chosen scent, creating a unique aroma
- The “Smell Market” can allow for control over scent copyrights in the fragrance industry. The adoption of blockchain technology and NFTs further ensures authenticity, ownership, and even resale rights.
- The potential for collaborations with celebrities, brands, and influencers to create signature scents opens up new avenues for engagement and creativity.

Web 3.0 & Metaverse technologies in fragrance manufacturing ushers in a new era of transparency, traceability, and sustainability. Decentralized protocols and blockchain integration enhance supply chain visibility, ensuring authenticity and ethical sourcing, while empowering consumers with a personalized, interconnected fragrance experience.

- **Byredo**, which is breaking new ground by teasing the first-ever perfume for Web3. Partnered with Nike owned digital fashion startup Rtfkt, it involves 26 ingredients that represent different emotions (harmony, naivety and virtue) which are digital collectibles valued same as the precious raw materials in the real world. They will come in limited quantities and be wearable on avatars. Collectors will also be able to create customised scents by mixing together two of the digital ingredients. 2,000 physical bottles of perfume will then be produced, individually numbered and identified with a type of chip, known as an NFC tag, that will connect it to you
- In 2022 alone, L’Oréal filed 17 trademarks for virtual cosmetics
- **Fenty Beauty** recently filed a series of trademarks for "downloadable virtual goods" for Web3
- In March, **Decentraland** hosted the first ever **Metaverse Fashion Week**, where octopus waiters served drinks, one of the world's biggest beauty brands made its debut and avatars strutted down the runway wearing realistic iterations of clothes by high-end labels like Dolce & Gabbana

Our PoV and User Centric Approach

Differentiation by Design

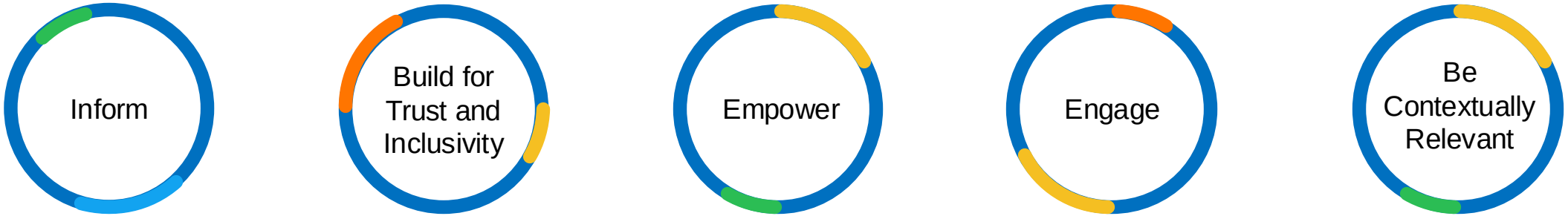
Our goal is to improve the way client see's its customers by **re-imagining the customer journey**

We aim to achieve this via the following interventions:

- Customer understanding and **their Journey Mapping**
- **Portal optimization** across devices
- **Human Factors** (Usability) & **Accessibility**

Our User Experience Point of View (PoV)

To deliver the WOW Experience, our Web / Mobile Apps must

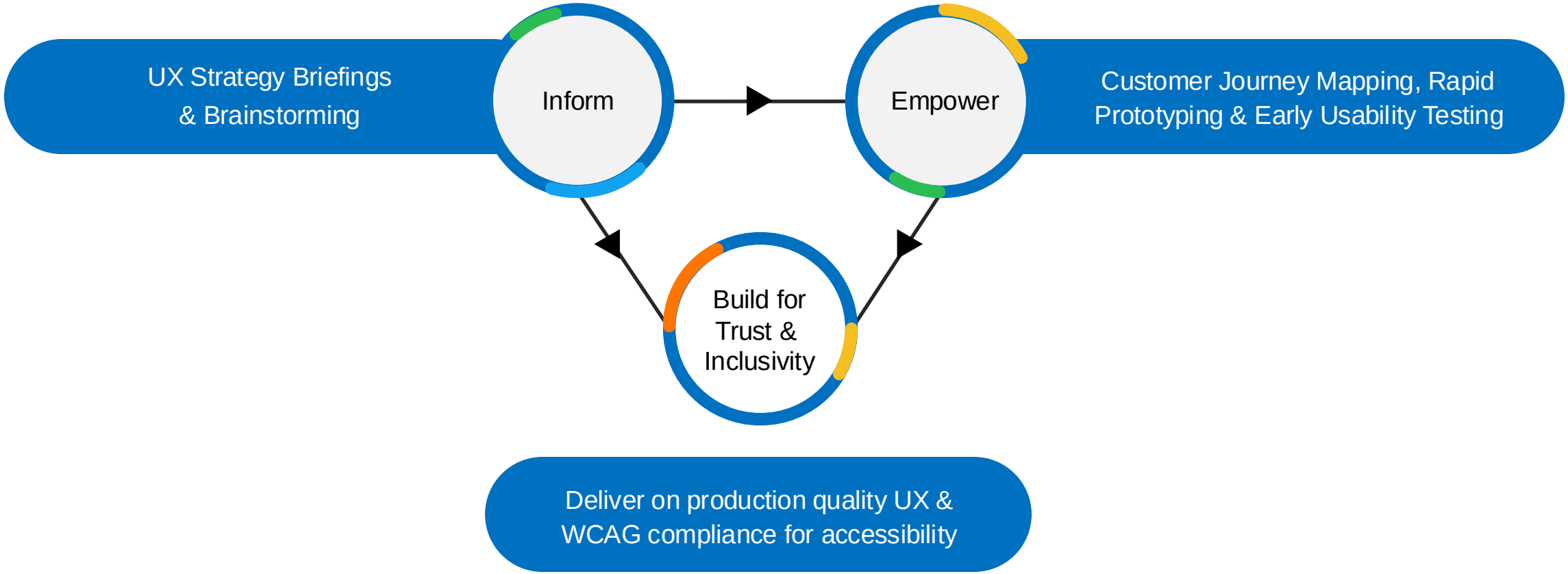


Customers, End Users & Stakeholders

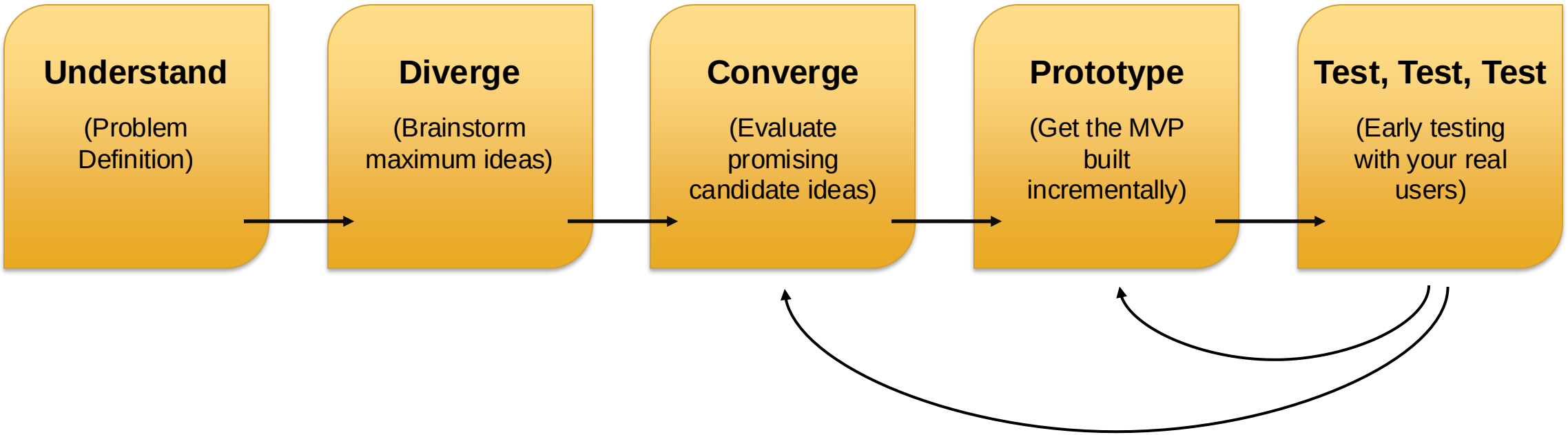
Focus on Customer Interactions at every stage of the Customer Journey

(discover, evaluate, buy, access, use, get support, leave, re-engage…)

Our UX Engagement Process



Design Sprints leading to MVP



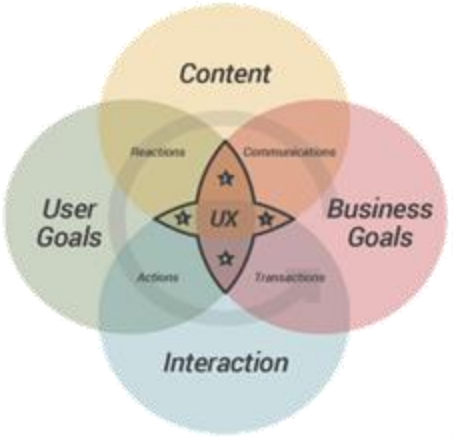
Crafting Compelling Experiences across Touchpoints

Understand Business Need | **Gather Business Requirements** | **Customer Journey Mapping & Persona Creation** | **Low / High fidelity Wire framing** | **Designing the mobile User Experience**

CUBI Model

This model below helps bring out creativity, communication, simplification through multiple scenarios, collaboration and uncovering gaps. Below are the layers of this model.

Architecture
Methods
Treatments
Models
Types



Outcomes
Behaviors
Motivations
Needs
User Types

Mission
Outcomes
Offerings
Operations

Pattern
System
Device
Human

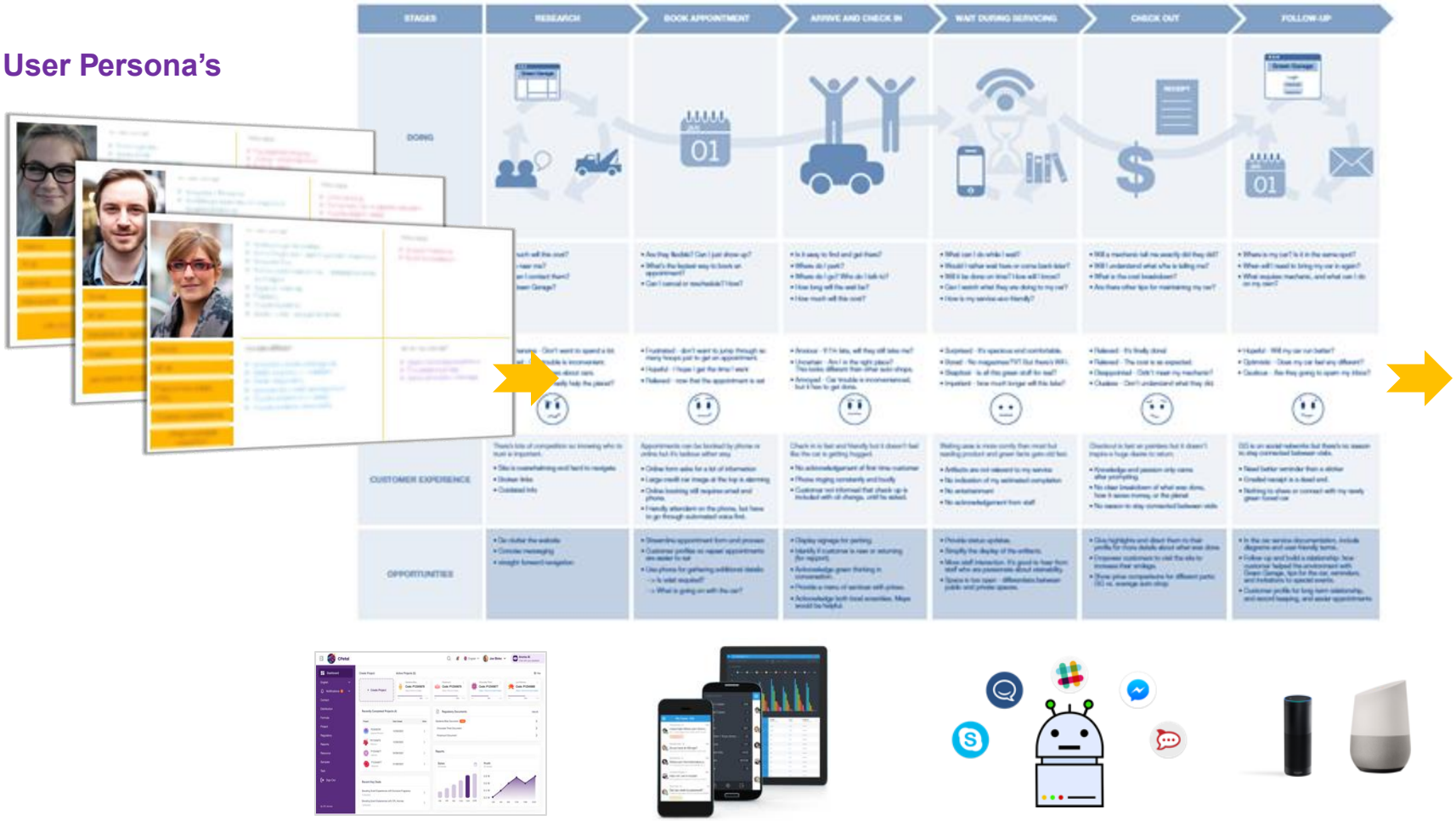
Personas - Journey Maps - Wire framing - Usability Testing

Wireframes
Paper Mockups
UI Specifications
Expert Reviews
Use Case Scenarios
Informal Usability Testing
Functional Prototypes
Formal Usability Testing
Field Studies
User Persona's
Style Guides

Customer centric & Usability tested Mobile UX Design

Delivering the Brand Promise throughout the Customer's Journey

User Persona's



Illustrated representation of customer expectations, experiences and feelings across multiple stages and channels while using a product or consuming a service

Outcomes to achieve

- Enhance Engagement
- Reduce Churn
- Increase adoption
- Reduce Customer Service & support Cost
- Increase Employee Engagement
- Reduce time taken to perform transactions
- Enhance On-boarding
- Personalisation

Making your Digital Experiences Inclusive & Accessible

Web Content Accessibility Guidelines 2.1

Perceivable

Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language

Provide alternatives for time-based media

Create content that can be presented in different ways (for example simpler layout) without losing information or structure

Make it easier for users to see and hear content including separating foreground from background

Operable

Make all functionality available from a keyboard

Provide users enough time to read and use content

Do not design content in a way that is known to cause seizures

Provide ways to help users navigate, find content and determine where they are

Understandable

Make text content readable and understandable

Make web pages appear and operate in predictable ways

Help users avoid and correct mistakes

Robust

Maximise compatibility with current and future user agents, including assistive technologies

A Level

AA Level

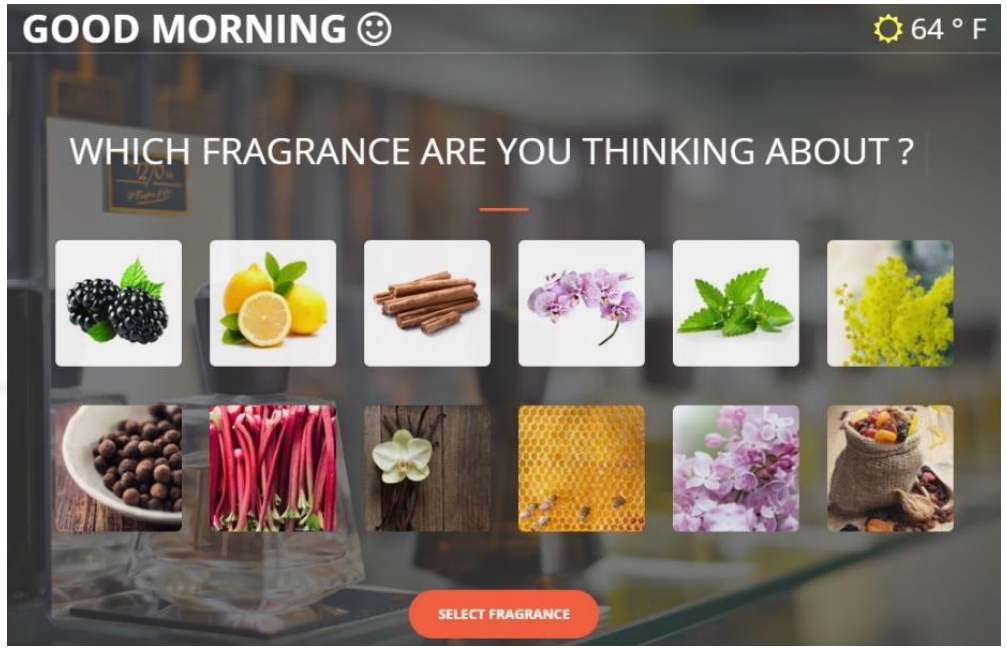
AAA Level

Some Use Cases

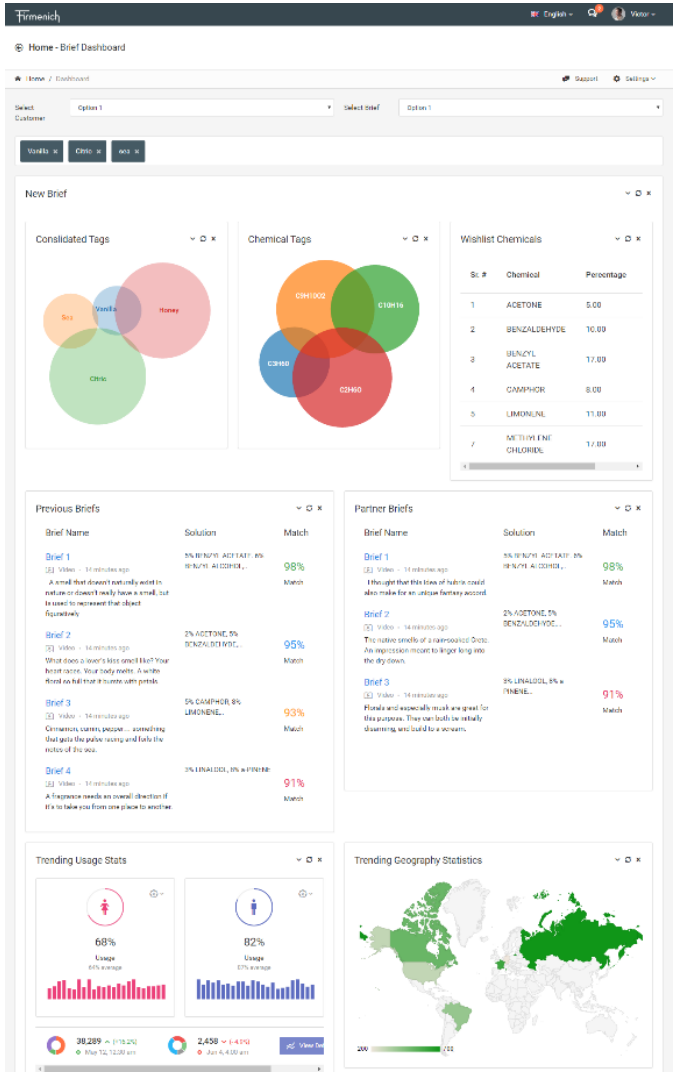
Creative Brief Management Platform

- Enabling Customers to express brief in a creative way
- Helping our customer team in Go/No-go decision
- Providing Perfumers/Scientists with consumer insights
- Integrating with the other partner and third party systems
- Engaging our customer employees via Conversations

App UI



Team – Brief Management Dashboard



Stock Management

Concept

Digitalizing the stock management process in the product stock rooms

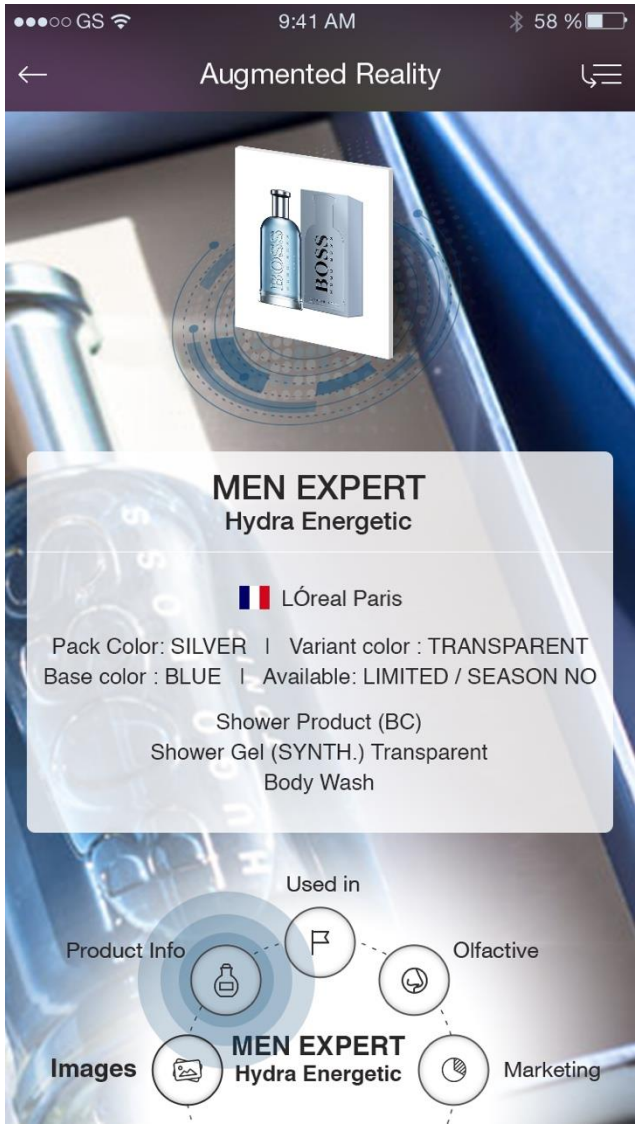
Use Cases

- Help to manage product inventory.
- Use RFID/NFC technology along with mobile app to add, check in, check out
- Product Search
- Dashboard Reports

Experience

The Lab team will be able to track samples and sample related information using the system

Product AR Experiences



Concept

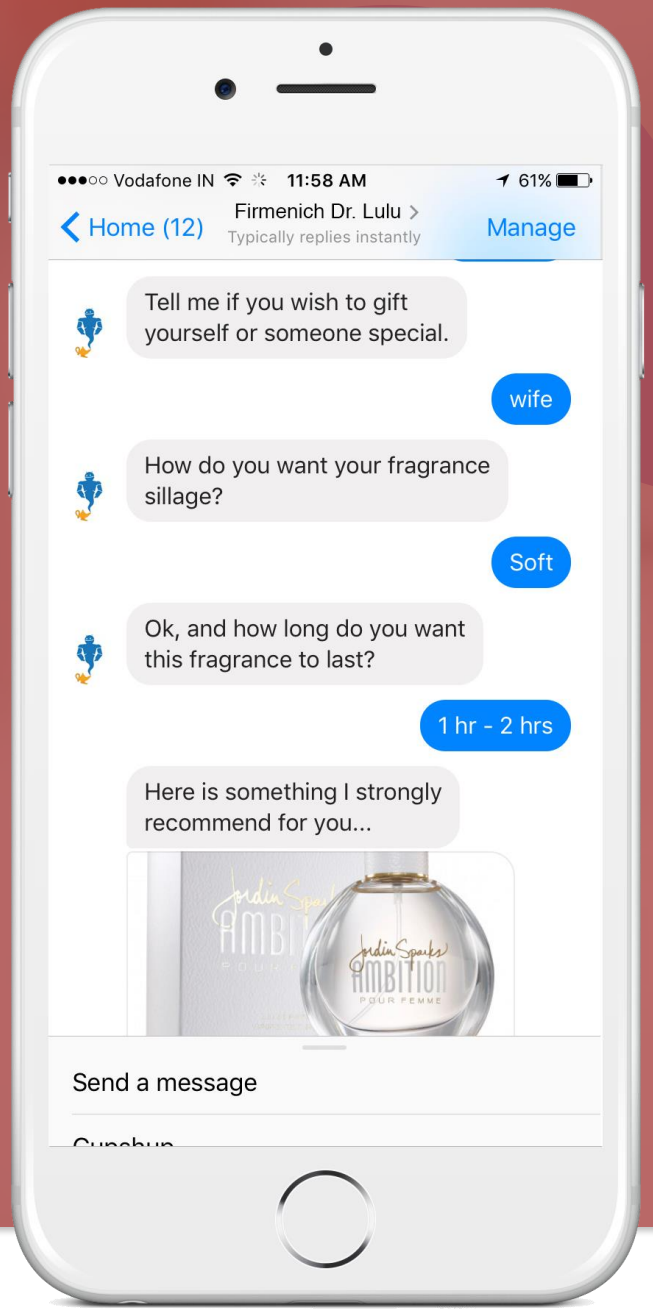
Create a Product Learning feature in an Inventory Management App for any fragrance company.
The app would provide an interactive learning experience.

Approach

- Researched and identified pre-trained model and computer vision to recognize the product (Open CV Library & Google Tensor flow)
- Designed a User Interface to display the dynamic product information

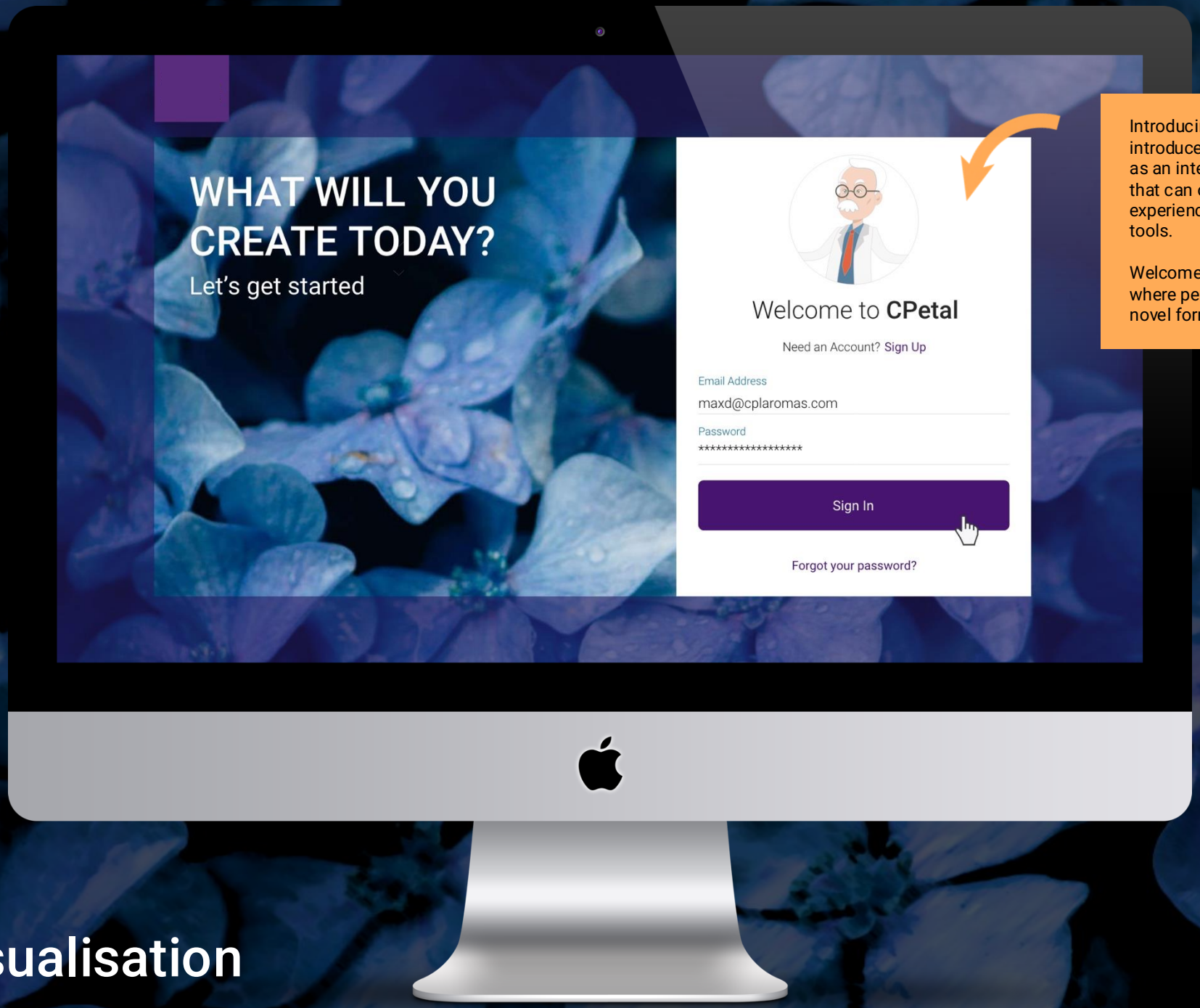
Experience

The customer lab team would use the app to identify the products and get the product information using the device camera.



Using Conversational Interfaces for exploration and conversion

The rate of respiratory disorders in North India has increased by 12% this year, Linalool compound is a known narcotic and can cause central nervous system disorder in the long run.



Introducing the possibility to introduce an AI based avatar can act as an intelligent AI based assistant that can offer an altogether new experience of working with such tools.

Welcome to **CPetal Virtual Lab** where perfume scientists can create novel formulations using AI.

Quinnox
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Re-imagine
Formula Visualisation

Perfume Scientist enters his formulation details and clicks on ‘Validate Uniqueness’ button to submit his formulation & look for relevant matches.
He can also save this configuration by clicking on the ‘Save Draft’ button.

Formula Visualiser

ACTIVITY LOG | MY MESSAGES 2 | NOTIFICATIONS 2 | REPORTS | Search... | Hi! Max D’Costa, Perfume Scientist

CREATE FORMULA
MENU ITEM 2
MENU ITEM 3
MENU ITEM 4

Hello Max!
Let’s create a new fragrance, shall we?

Enter your formulation details

What do you wish to call this fragrance?
Wild Roses

Enter Ingredient Name	Enter Chemin Value	Enter Cost (£)
Linalool	Chemin@1	100.00
Hydroxycitronellal	Chemin@1	75.00
Bergamot	Chemin@1	50.00
Galbanum Oil	Chemin@1	50.00
Vetiver Oil	Chemin@1	30.00
Vanillin	Chemin@1	60.00
Musk Ketone	Chemin@1	40.00
Benzyl Acetate	Chemin@1	50.00
Heliotropine	Chemin@1	50.00
Rose Absolute	Chemin@1	50.00

(+ Add More)

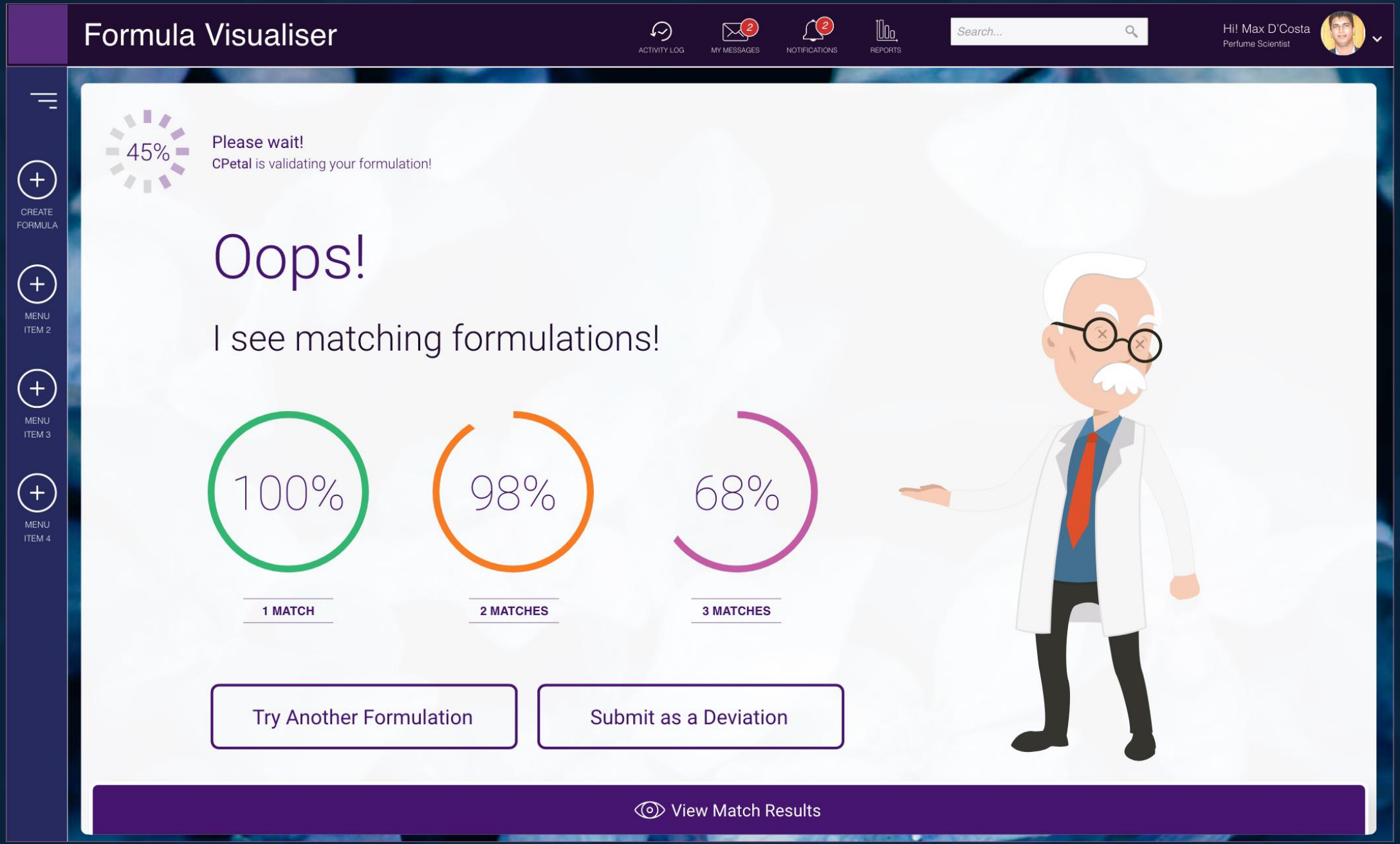
Save a Draft

What happens next?

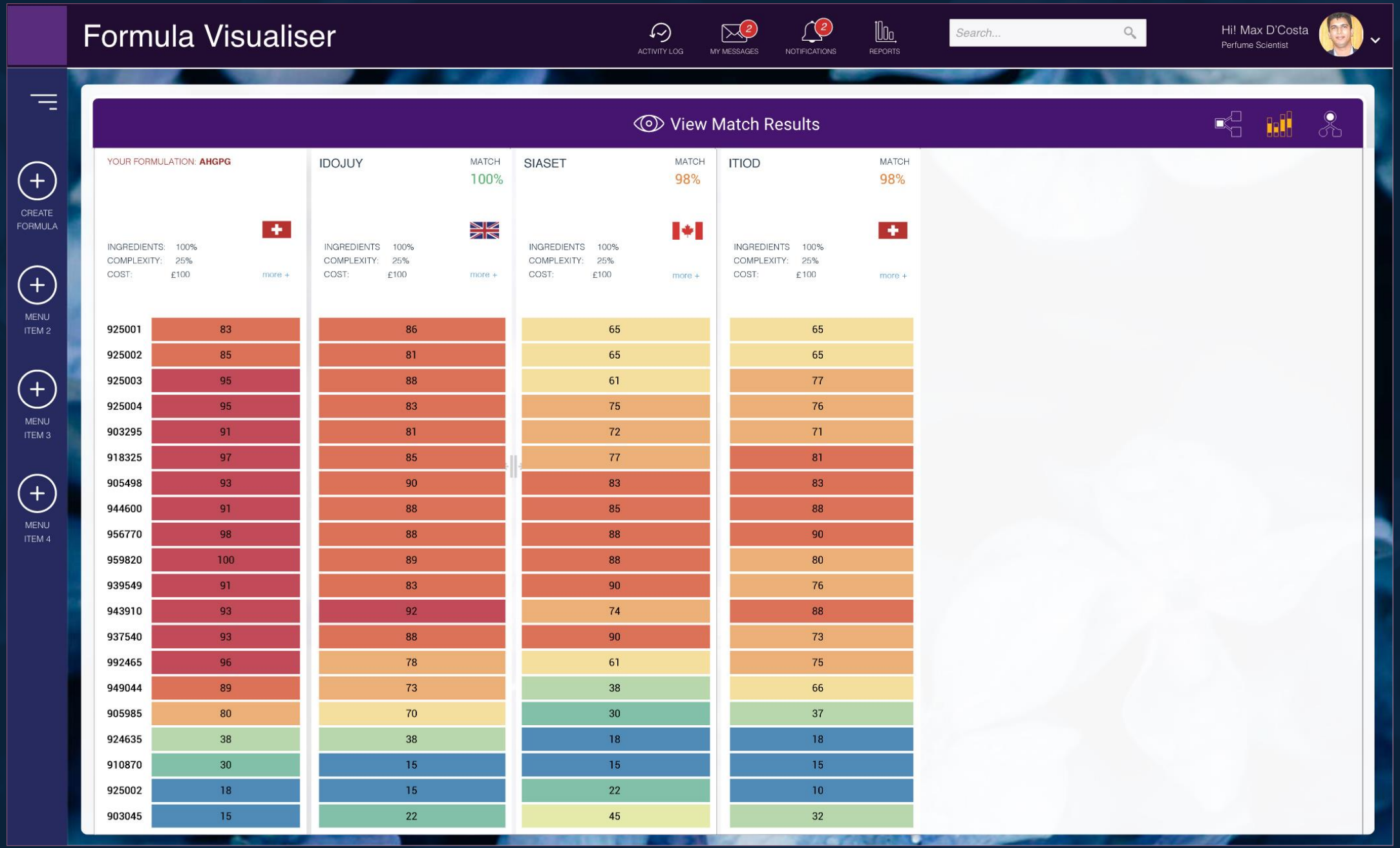
To help you make a unique creation, our AI based virtual perfume scientist will match your formulation against possible nearest matches so that you can make the necessary tweaks in your ingredients, costs and complexity parameters. So go ahead! Validate your formulation and create it.

Validate Uniqueness & Submit

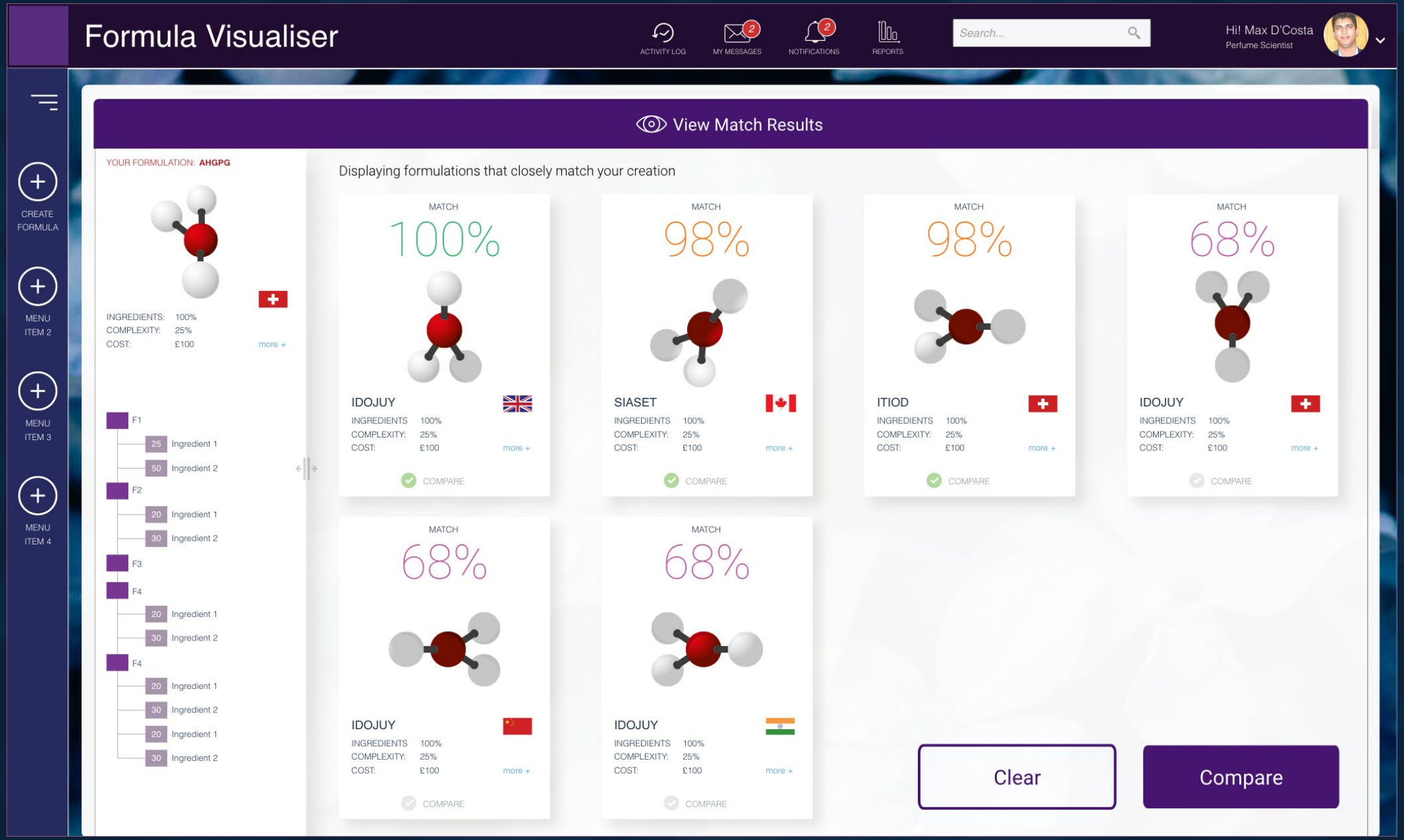
On clicking the ‘Validate Uniqueness’ button & submitting his formulation, the AI assistant returns possible nearest matches for the submitted formulation.
Here the Perfume Scientist can decide to go back and try another submission or do a quick view to see ‘Similarity Visualisations’ of the nearest matches to analyse the novelty factor.



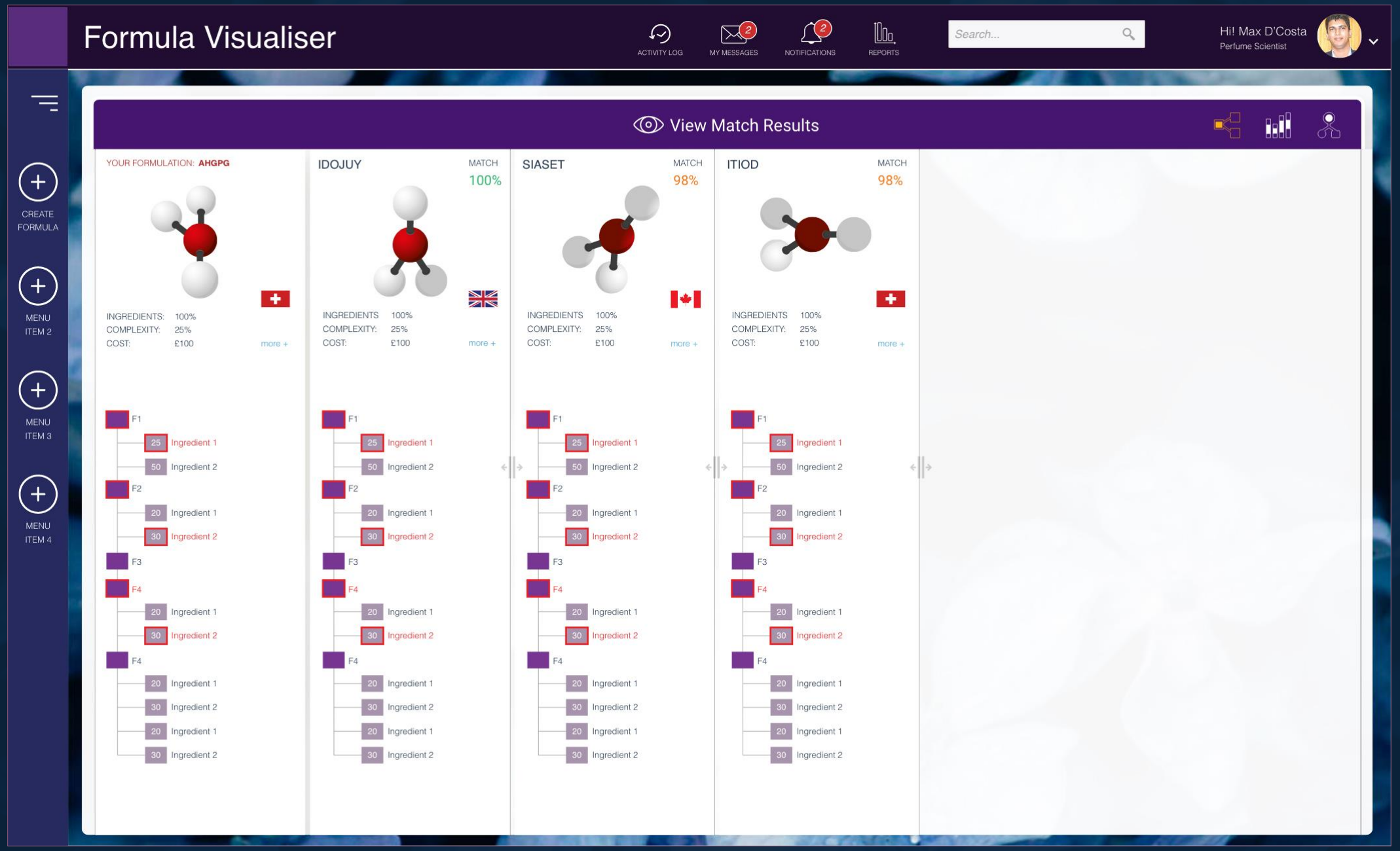
On clicking the ‘Validate Uniqueness’ button & submitting his formulation, the AI assistant returns possible nearest matches for the submitted formulation. Here the Perfume Scientist can decide to go back and try another submission or do a quick view to analyse the novelty factor through various visualisation formats (e.g. heatmap visualisation) and others.



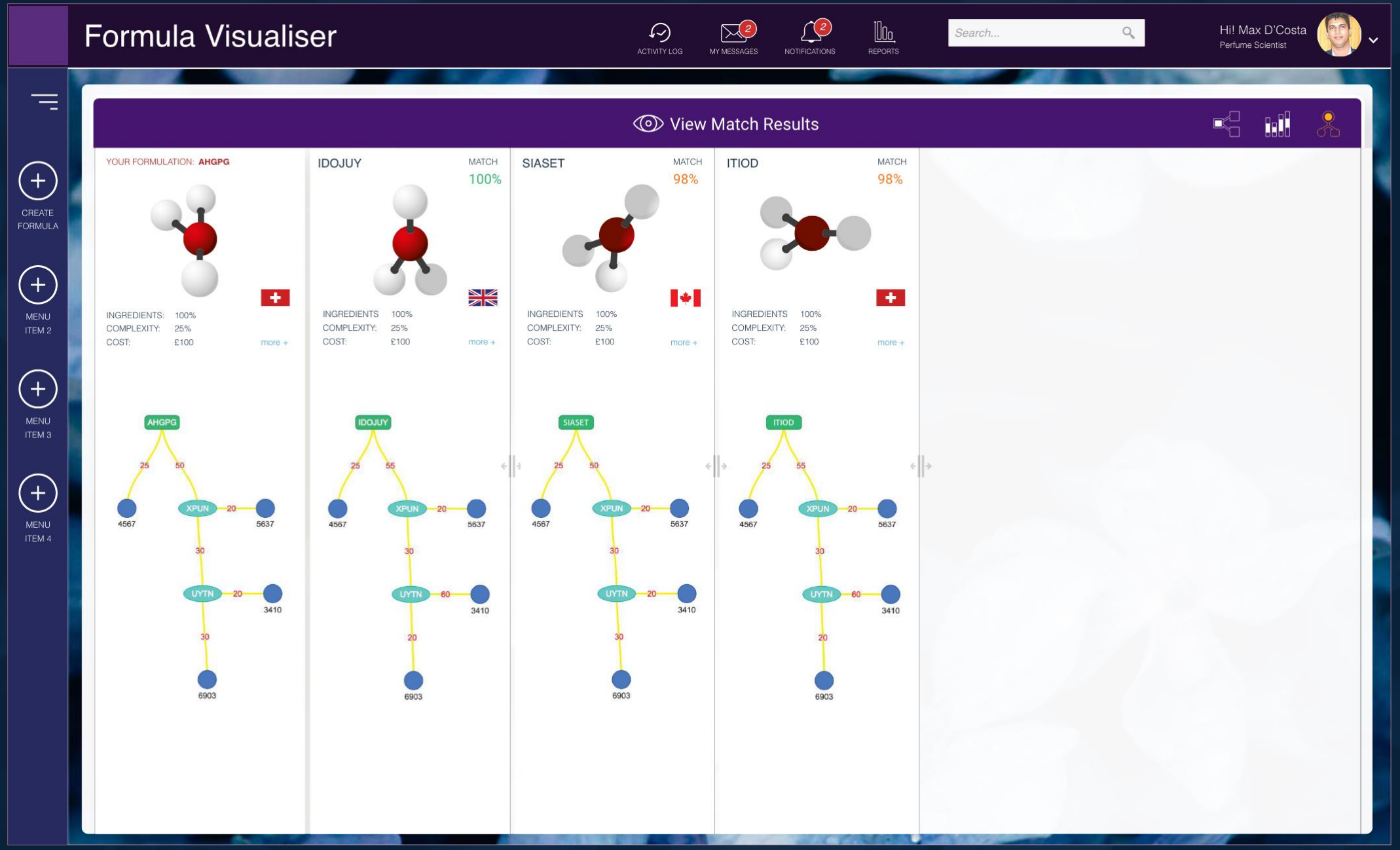
On clicking the ‘Validate Uniqueness’ button, it displays a brief card view of nearest matches to the reference formulation along with some additional details like Ingredients, Complexity, Cost, and Match %). Here the Perfume Scientist can select the items which he wants to compare to see the ingredient level details.



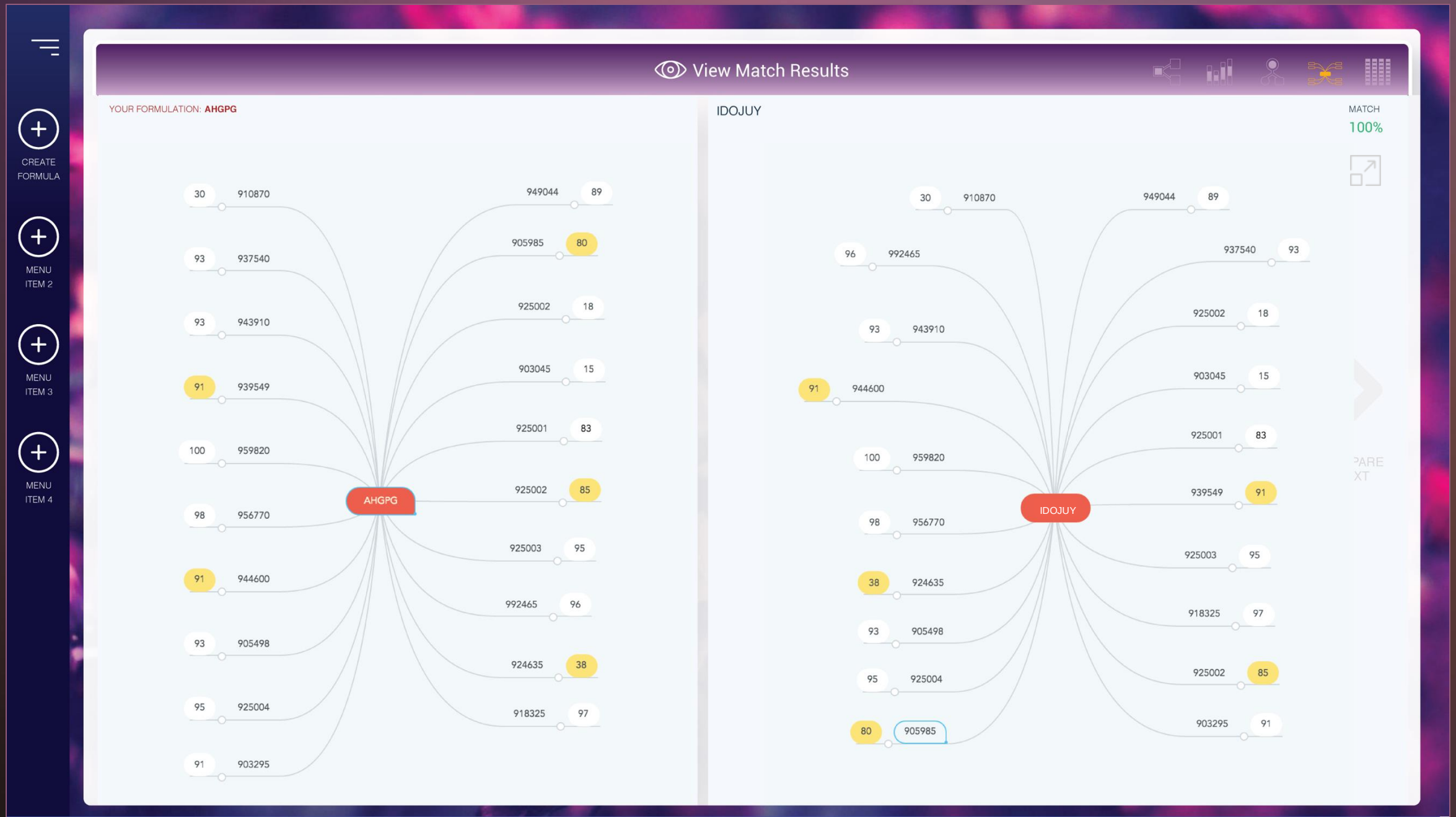
On clicking the ‘Compare’ button it shows this ‘Tree View’ as one of the Visualization Options. Additional Visualization options can be selected from the top right section by selecting the appropriate visualization styles.



This is another Visualization option showing matches at the Ingredient level.



This is the ‘Mind Map’ visualization view at the Ingredient Level.



Thank you

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