Rapid Sensory Lexicon Generation using AI Technology

Dr P Mehring | MMR Research Worldwide, UK

BACKGROUND

The advent of AI technologies presents an exciting opportunity to enhance efficiency and agility within sensory panels and enable teams to deliver reliable sensory outputs in much shorter timescale.

It was therefore hypothesised that:

- By training and embedding sensory expertise, including MMR's Global Lexicon database, a bespoke Large Language Model (LLM) can be used to fast-track lexicon generation.
- AI technology can be used to create a 'one-stop-shop' for panel leaders: lexicon generation, DA style data collection and exported sensory data.

Sensory Portrait is embedded within MMR's recently launched automated product testing platform: Product Hub (**https://theproducthub.com).** Sensory Portrait provides data on the key sensory attributes of products, offering additional insights into the sensory touchpoints which are driving consumer choices.
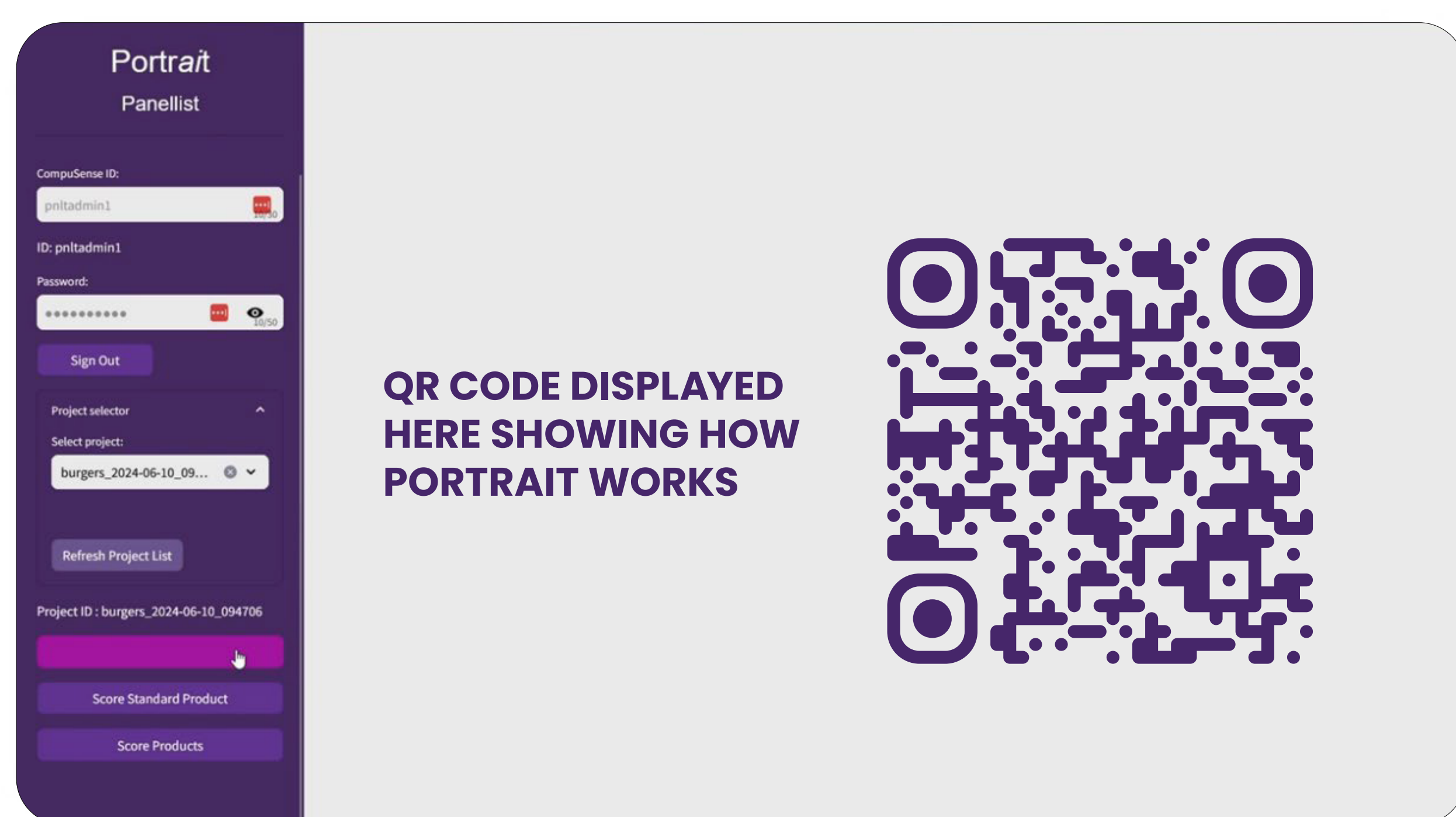
THE APPROACH

STAGE 1: INTEGRATING AI MODELS & SENSORY SCIENCE

- Critical steps essential for generating good quality sensory data were identified, providing crucial insights into the potential of integrating AI to enhance agility in sensory analysis.

STAGE 2: DEVELOPING THE AI SENSORY PANEL

- A pioneering AI Innovation Sensory Panel was established, comprising of members from MMR's expert sensory panels.
- These panellists were exposed to AI technologies, guided by the insights gained from Stage 1.
- The MMR sensory team worked closely with MMR's internal AI experts demonstrating the power of combining expertise.

STAGE 3: PILOT TESTING & OPTIMISATION

- MMR's global sensory teams engaged in pilot testing to refine the "Sensory Portrait" tool in a series of sprints.
- This iterative process enabled optimisation of the functionality of the LLM to ensure that Sensory Portrait seamlessly integrates it into MMR's Product Hub platform.

CASE STUDY: JADE AND JOY VEGAN CHOCOLATE COATED PROTEIN BARS

PROJECT AIM: To validate that Jade and Joy's new chocolate coated protein bar meet consumer expectations and maximized the potential for adoption into their regular consumption patterns.

OUTPUTS: Sensory Portrait added nuanced understanding to the consumer data providing more detailed objective understanding of the similarities and differences between the Jade and Joy product and two competitors.
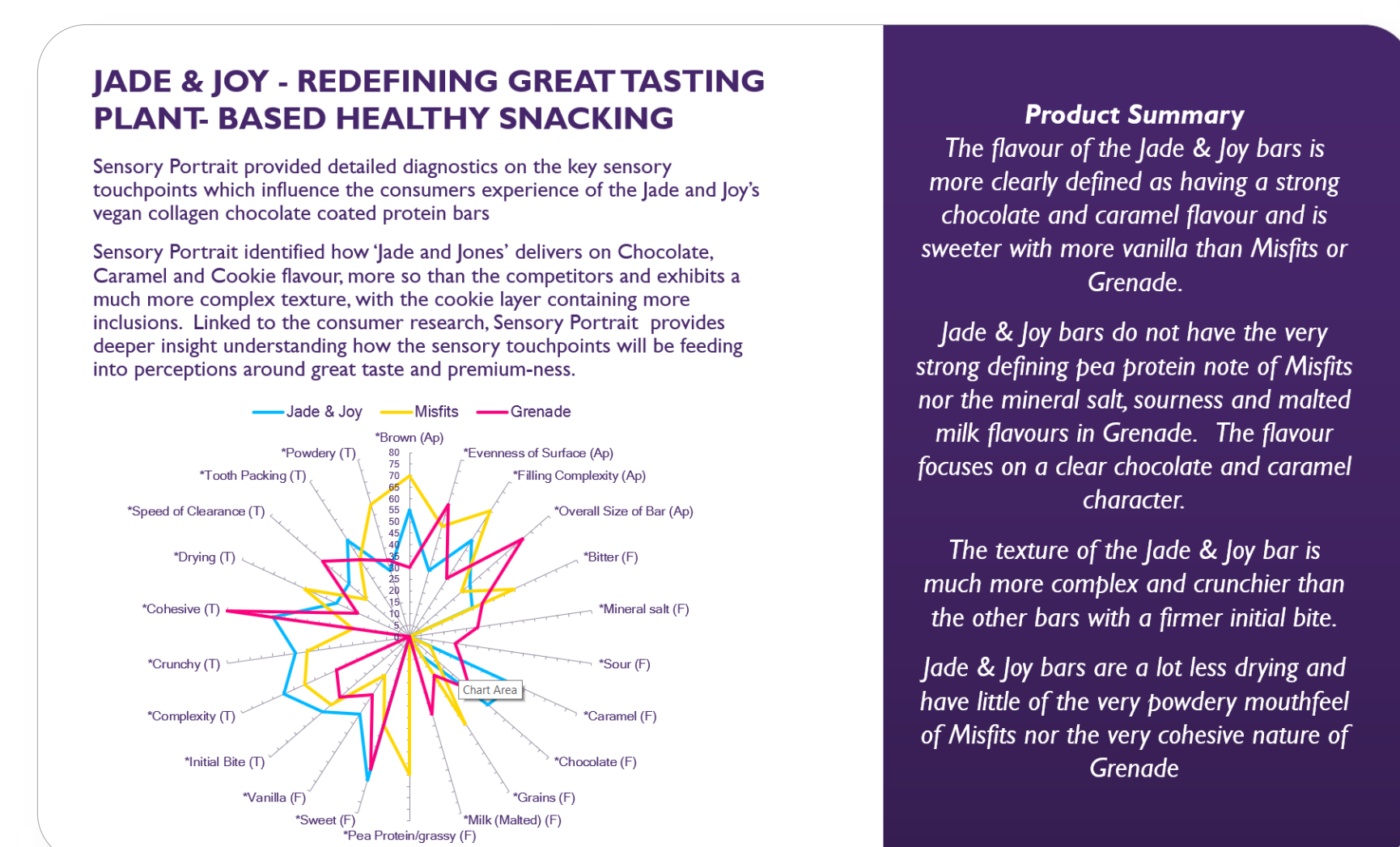
HOW THE LLM CREATES EFFICIENCIES
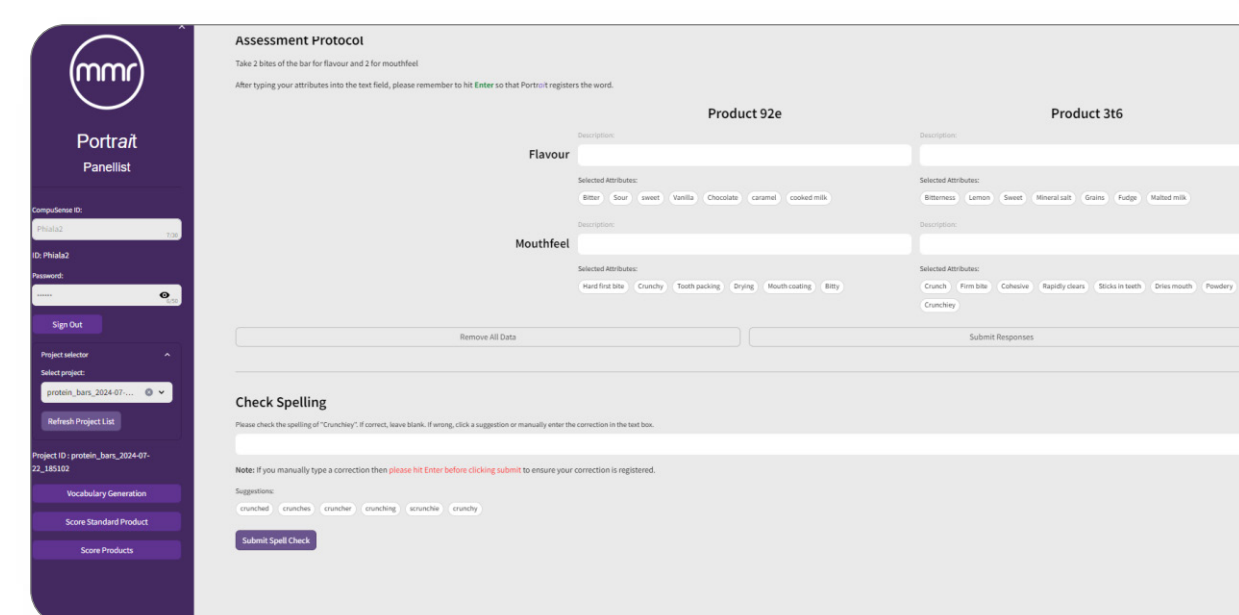
The connection with MMR's Global Lexicon database will enable panellists to be shown a range of descriptors and spellings as they enter attributes, to standardise inputs.

The LLM groups attributes semantically allowing the Panel Leader to use natural language to enhance and optimise the groupings.

The LLM learns from how the Panel Leader regroups the attributes.

The Global Sensory Lexicon will augment this utilising the database to optimise groupings.

BENEFITS

AGILE LEXICON GENERATION
Lexicon generation only took 1 hour from initial elicitation to final lexicon creation.

EFFICIENT DATA GENERATION AND VERIFICATION
- Data generation within Sensory Portrait, followed by a consensus-based data verification process, which only required 2 hours of panel time.
- Sensory Portrait is designed to run the project in one panel session.

PROGRESSIVE DEVELOPMENT OF LLMS
- **Continuous Improvement Through Sensory Expertise:** Panel leaders continuously train the LLMs using their sensory expertise, providing feedback directly within Sensory Portrait.
- **Integration with MMR's Global Lexicon Database:** The LLMs are being further enhanced through ongoing links to MMR's global lexicon database.

DELIVERING AGILE SENSORY DIAGNOSTICS
- **Rapid, Accessible Sensory Data:** Sensory Portrait delivers agile sensory data that directly integrates with consumer research via the Product Hub platform.
- **Bridging the Gap for Novice Clients:** This approach introduces the advantages of sensory data to clients with little or no prior experience in sensory profiling, making sensory diagnostics quick, easy, and accessible.

CONCLUSIONS

The utilisation of trained LLMs is transformative in gaining efficiencies during lexicon generation. The use of AI can also increase agility in the data capture stages of sensory profiling.

The development of Sensory Portrait and its incorporation in MMR's Product Hub platforms demonstrates how leveraging AI technologies alongside established expertise with sensory scientists can drive innovation and efficiency in developing new sensory research methodologies.