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Thomas Hillemann, PhD, Head of Study Coordination, Beiersdorf AG, Hamburg, Germany.

The Task

For a specific project aiming at the formulation of a body lotion from natural ingredients, Beiersdorf had already attempted earlier to solve it by conventional approaches, but the formulation experts failed to come up with a stable formulation based on the standard approach used in the laboratory. After at most three months, all of the formulations that had been tried earlier became instable.

Originating from the constantly changing market requirements, the needs to come up with a creative way of discovering new product formulations, and the expectation to shorten product development time, Beiersdorf engaged the team of Thomas Bäck of the former NuTech Solutions GmbH for applying their data analysis and optimization technology – now known as ClearVu Analytics – to those challenges in product development.

Solution Approach

Based on using ClearVu Analytics, a predictive model for stability was derived from Beiersdorf's existing experimental data on formulations and their stability. This model was then used for predicting stability of new formulations, derived from existing ones through modifications. Those modifications include both the replacement of ingredients by others as well as changes of ingredient concentrations. A new formulation predicted to be stable was then used as the starting point for the next modification.

Using a virtual formulation development process, models predict characteristics of suggested combinations of ingredients and quantities, improving the resulting recipe by reincorporating the desirable attributes with each subsequent model. As a result, ingredients not considered by traditional approaches are suggested by ClearVu Analytics.

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Results

Based on a complete integration (including specific customization to integrate into Beiersdorf's IT infrastructure) of ClearVu Analytics into the product development process at Beiersdorf, formulation developers are able to develop a new formulation in a surprisingly short amount of time. The new formulation satisfies all requirements on stability and viscosity. In addition, the experts are able to derive new knowledge about formulations, and have revised their assumptions concerning the impact of certain ingredients on stability.

In addition, product development time (in terms of the number of experiments required in the laboratory) is significantly reduced, because using predictive models reduces infeasible experiments (yielding unstable products, for example) and significantly increases the probability for finding feasible formulations.

Services

Divis offers the following services for your project:

- KickOff-Meeting
 - Preparation of project schedule and project team
 - Technical support for sensor and data validation
- Technical control of the sensors
 - Functional monitoring
 - Additions, modification of sensors
 - Control of the data base structure
- Project support
 - Review of the data preparation, Data mining, data evaluation
 - Modeling
 - Telephone support
 - Checks and support on site
 - Checks and support for the modeling
 - Evaluation of the results and model optimization

License

During the project we will work with data modeling tools which are suitable to achieve the required predictions. divis's tools, for example ClearVu-Analytics, belong to the leading modeling tools for such applications. Another interesting point to mention is the implemented global optimizer which can be an important element (to change the parameters).

Beside the standard license divis also offers an extension for an online connection of the models to the process. This is executed with runtime licenses which contain the momentarily valid models. In quasi-real-time the user is provided with the necessary predictions or, depending on the task, with the related trends.

Non-disclosure

divis and all those involved in the project undertake to keep confidential any information concerning the project and not to give them to third parties.

Warranty

divis assures that their engineering services are subject to the current state-of-the-art. divis reserves the right for technical changes if this serves the improvement of processes or products.

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