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Novel AI-driven automation platform enables optimization of laboratory protocols

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The platform leverages the power of artificial intelligence and connects diverse laboratory processes, data, and monitoring modalities to facilitate the robust and systematized assessment of diverse laboratory operations



In collaboration with a Japanese firm SBX Corporation, a Swiss-based firm Philip Morris International has developed a platform that uses artificial intelligence to deliver end-to-end laboratory automation to optimize laboratory operations.

A real-life High Content Screening (HCS) laboratory scenario has shown the potential of the new laboratory automation platform to facilitate complex scientific experiments.

“The powerful platform facilitates the robust and systematized assessment of diverse laboratory operations. It measures and quantifies the performance impact of specific constraints and enables cost-effective decision-making,” said Diego Marescotti, HCS Manager, System Toxicology, PMI.

The platform is organized around four core layers:

1) Facility Layer, covering the physical layout of the laboratory, including entry/exit points, windows, and air vents, electrical layouts, etc.

2) Equipment Layer, detailing all laboratory equipment and its position in the facility

3) Operational Layer, encapsulates the operational flow of an experiment protocol, particularly the movement of people/materials and the use of equipment

4) Information Layer, capturing the flow of information and the computational workflows of a given experiment. Based on Garuda technology the platform is controlled by an Automation Dashboard and three customizable modules: a Layout Manager, a Workflow Manager, and a Simulation and Results Manager.

"The flexible platform is configured to assess protocols in any type of laboratory, running any type of experiment, by leveraging the power of artificial intelligence and connecting diverse laboratory processes, data, and monitoring modalities,” said Samik Ghosh, CTO, SBX Corporation. The modular nature of the platform allows for the future integration of the system with new laboratory technologies and techniques.