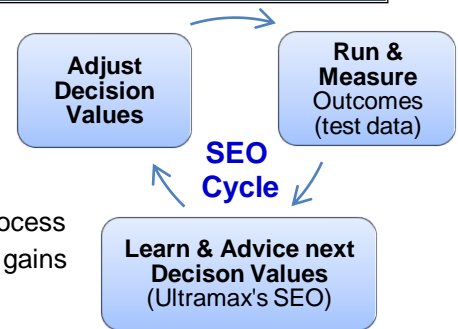# ULTRAMAX®

FOCUS: DESIGN & OTHERS

Catalysis in Analytics: Accelerate Innovation and Improvements

Ultramax® is an Optimization Guiding Software to enhance dramatically the effectiveness and business impact of engineers making quantitative decisions when tests are made sequentially, and thus can be refined by learning from past tests' results. By solving problems in *notably fewer tests* and the complex analytics being *automatic*, *Ultramax* yields *better, faster* results in a *simpler* and *lower cost* way.

Basis: In technical areas there are two complementary types of **improvements**: (1) better decisions about the conceptual ideas and technology which constitute a System; and (2) better quantitative decisions in the utilization of those ideas and technology (how much, how many, size, levels) so that the System delivers the most desirable performance (including economic aspects).

Adjust Decision Values

Run & Measure Outcomes (test data)

SEO Cycle

Learn & Advice next Decison Values (Ultramax's SEO)

Quantitative decisions are inherent in the engineering areas of Product and Process Design, and Operations. Some decisions are crucial due to potential for: (a) large gains in generating better outcomes, and (b) reducing time, costs and risks in the testing.

Ultramax applies *Sequential Empirical Optimization (SEO)* cycles. Its automatic, multivariable, Intelligent Analytics enables "*rapid learning from experience how to do better™*". It is applicable to:

➢ Improving the effectiveness of Product and Process **Designs** while reducing development time and costs. (Imagine: creating a new product with desired tested characteristics at lowest component and processing costs).

➢ **Tuning** the **Parameters** included in rules, algorithms, treatments, methods and formulas.

➢ Improving the reliability and performance of **Operations**, especially Production / Manufacturing (for which Ultramax was initially designed). The SEO Intelligent Analytics can also be built into the design of products with integral digital control to achieve self-optimization of operating performance.

Test runs can be made with physical systems (lab equipment, prototypes, pilot plants and ongoing operating systems); and also with computer simulation models.

Decision values may involve a combination of: amounts of ingredients, dimensions, distances, sizes, angles, shape parameters, times / timing, frequencies, temperatures, pressures, voltages, amps, gains, flows, feeds, speeds, depth of cut, ratios, thresholds, which pumps should be working, number of servers, etc. Each set of decision values applied to a System delivers a different set of performance metrics – which are evaluated by the user's criterion of overall performance: e.g., balancing various metrics (to be larger, smaller, or closer to target values) while keeping input/output values within constraints.

Ultramax's benefits are greater when the problem is: (a) multivariable (several inputs and/or several outcomes – i.e., a complex analysis); (b) when getting better results is of value; and/or (c) when running tests is lengthy or costly.

Optimal quantitative decisions are those that yield the best performance possible with the System components, given their capabilities and availability. While engineers of course strive to optimize their decisions, our experience shows that barriers inherent in other analytical solutions (time, complexity, risks) often lead to significantly limited optimization levels vs. Ultramax.

Ultramax does not require the user to create computer models, or to manage any analytics; it is *simple* to use. It is so automatic that as Supervisory Control it can run autonomously closed-loop. Ultramax's approach is truly unique (patented), and where applicable it offers major benefits over other optimization analytics -- e.g., it optimizes decisions with far fewer runs / tests than experiments required by design of experiments (DOE) or neural networks (NN). An additional advantage of rapid optimization is to learn quickly when a System is incapable of providing satisfactory performance, alerting engineers to focus on improving decisions about the conceptual ideas and technology which constitute the System (see **Basis** above).

A Stand-Alone (manual) license can be used for any number of applications in one site.

UMC and its Agencies world-wide look forward to partnering with you in enhancing the effectiveness and value of your processes, products and personnel. We enable you to experience the possible improvements by providing you the right software, training, guidance and support. We offer a no-cost evaluation of applicability. Except for travel costs, annual 100% ROI is guaranteed if you evaluate benefits in economic terms and we estimate sufficient potential.

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