

# 2025 EU Users Group

## FDC Process Control & Applications

**Jon Holt - PDF**

Sr Director, Product Management

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# AGENDA

## INTRODUCTION

**Jonathan Holt**  
Sr. Director, Product Management

## WELCOME

**Didier Vieux**  
Sr. Technical Product Manager

## FDC SOLUTIONS

**Maestria Updates**  
Mathieu Franco  
Process Control Product Manager

**Maestria BSM Presentation**  
Mathieu Franco,  
Process Control Product Manager

**Exensio Process Control Updates**  
Jianlei Tao  
Manager Field Applications

## FDC NEW GENERATION STATUS

**New Capabilities, Add-Ons**  
Jonathan Holt  
Sr. Director, Product Management

## GUEST SPEAKER

**Generative AI Virtual Assistants for Semiconductors**  
Ankush Oberoi, Ph.D.,  
President and CEO Lavorro,

## CCG

**Cimetrix Connectivity, Control, and Smart  
Factory Product Road Map Highlights**  
Alan Weber, VP New Product Innovation (CCG)

## SECUREWISE

**Secure Remote Connectivity Solutions for  
Semiconductor Manufacturers**  
Grant Swanson, Director of Sales and Business Development

**PDF**  
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**2025 USERS GROUP MEETING**  
**APRIL 10, 2025**

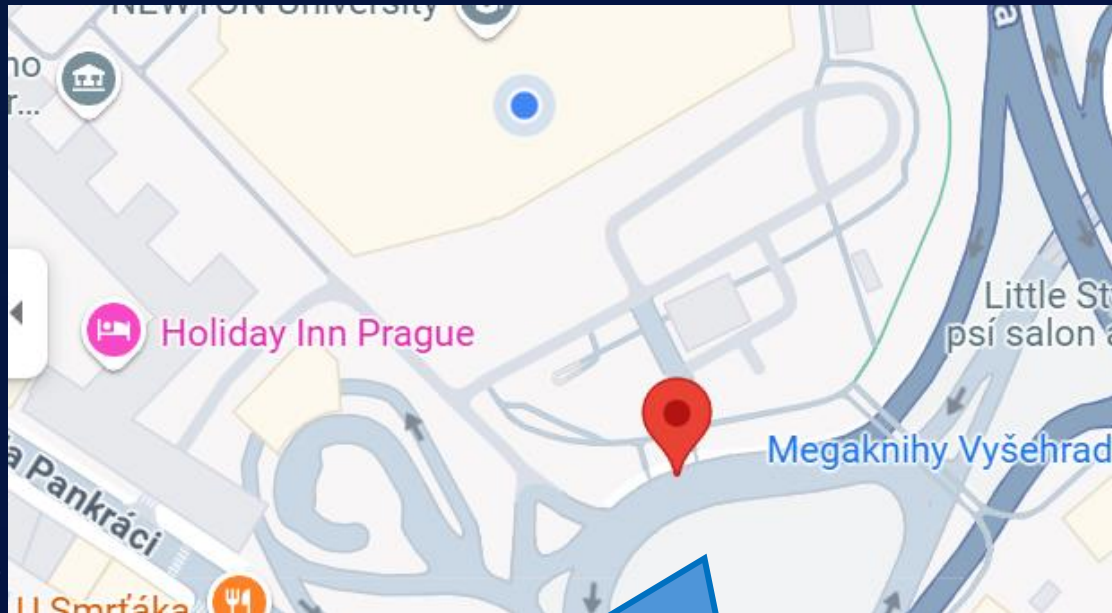


# Detailed Agenda

Session	Topic	Presenter	Start		Stop	Duration
Welcome	Introduction	Jonathan Holt	14:00	-	14:05	05:00 mn
	Organization of the Meeting	Didier Vieux	14:05		14:10	05:00 mn
FDC Solutions	Maestria Updates	Mathieu Franco	14:10	-	14:40	30:00 mn
	Maestria BSM Presentation	Mathieu Franco	14:40	-	15:05	25:00 mn
	Exensio Process Control Updates	Jianlei Tao	15:05	-	15:30	25:00 mn
FDC New Generation	New Capabilities, Add-Ons	Jonathan Holt	15:30	-	16:00	30:00 mn
	COFFEE BREAK		16:00	-	16:30	30:00 mn
Guest Speaker	Generative AI Virtual Assistants for semiconductors	Ankush Oberoi	16:30	-	16:50	20:00 mn
CCG	Cimetrix Connectivity - Product Roadmap highlights	Alan Weber	16:50	-	17:10	20:00 mn
SECUREWISE	Secure Remote Connectivity Solutions	Grant Swanson	17:10	-	17:30	20:00 mn
Evening Event:	Cruise on the Vltava river		18:15	-	22:00	



# Evening Event: Cruise on the Vltava River



Bus Transportation at 6.15pm



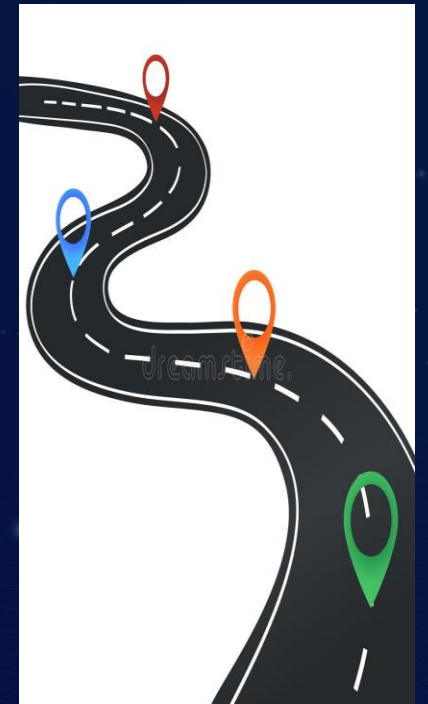
Our Boat



If you miss the bus, go to E. Benese street 118 00 Prague 7 – Subway C then A

# PDF Vision & Roadmap for Process Control

- Roadmap to enable upgrading Maestria and Exensio Process Control to deploy new AI and advanced solutions for Maestria and E-PC customers
- Maestria data collection fully backwards compatible, bulk indicators generated in Maestria and automated filters/SPC strategies utilized in advanced solutions and AI applications
- Provide Maestria customers access to new features, applications, existing Process Control features, and new AI capability
  - Auto-window / auto-indicator model creation
  - Auto-retarget adjustment of limits for PM, shift and drift
  - Interactive dashboards and templates
  - Knowledge augmented solutions (LLM's)
- Provide new AI/ML automated capability to significantly improve engineering efficiency and reduce effort and API's to enable 3<sup>rd</sup> party applications





# Outlook for AI and E-PC **Unification** with Maestria

## ■ **GOAL: Key capability to support AI and advanced control solutions**

1. An “**edge**” to “**cloud**” enterprise solution to link process data across the supply chain.
2. Hi-performance and scalable architecture to manage the **data volumes** and **collection speeds** required in new factories (from EDA Freeze-III to streaming) at a lower cost
3. Utilization of Exensio platform **automation and machine learning** to rapidly deploy control plans and MV predictive models **at the edge**
4. Enabling all SEMI standard data collection, native fab models and FDC for **other domains** like Assembly, Battery, SiC, etc...
5. Fab **Dashboards and Guided Analytics** to monitor the entire factory floor and enable drilldown to OOC events quickly
6. New capabilities: a) **Sapience Manufacturing HUB**; b) **R2R APC control**; c) **ModelOps** for FDC; d) **Realtime** streaming process control; e) **WTC** Whole Trace Control; f) **Knowledge Augmented Solutions (LLM)**



# FDC Strategic Roadmap

Products/Features Released last 12-mo

Advanced SPC Module, Sapience integration  
Whole Trace Control, Real-time FDC, ModelOps for FDC

## N-2

- Spotfie 12
- Windows 11 for client
- Global preference enhancement

## N-1

- Artifact Status management
- Custom Script UX
- Virtual Sensor UX
- 3<sup>rd</sup> Party R2R support
- 3-Tier Security

Included in next LTS

## NOW

- RHEL8 for Exensio services
- Filter Plan Manager enhancement
- OPC UA
- Linux PassThrough

## N+1

- Advanced SPC module
- Web UI for model configuration
- EDA DC enhancement
- Public API for artifacts
- RHEL9 support
- Apache Pulsar / Kafka Support

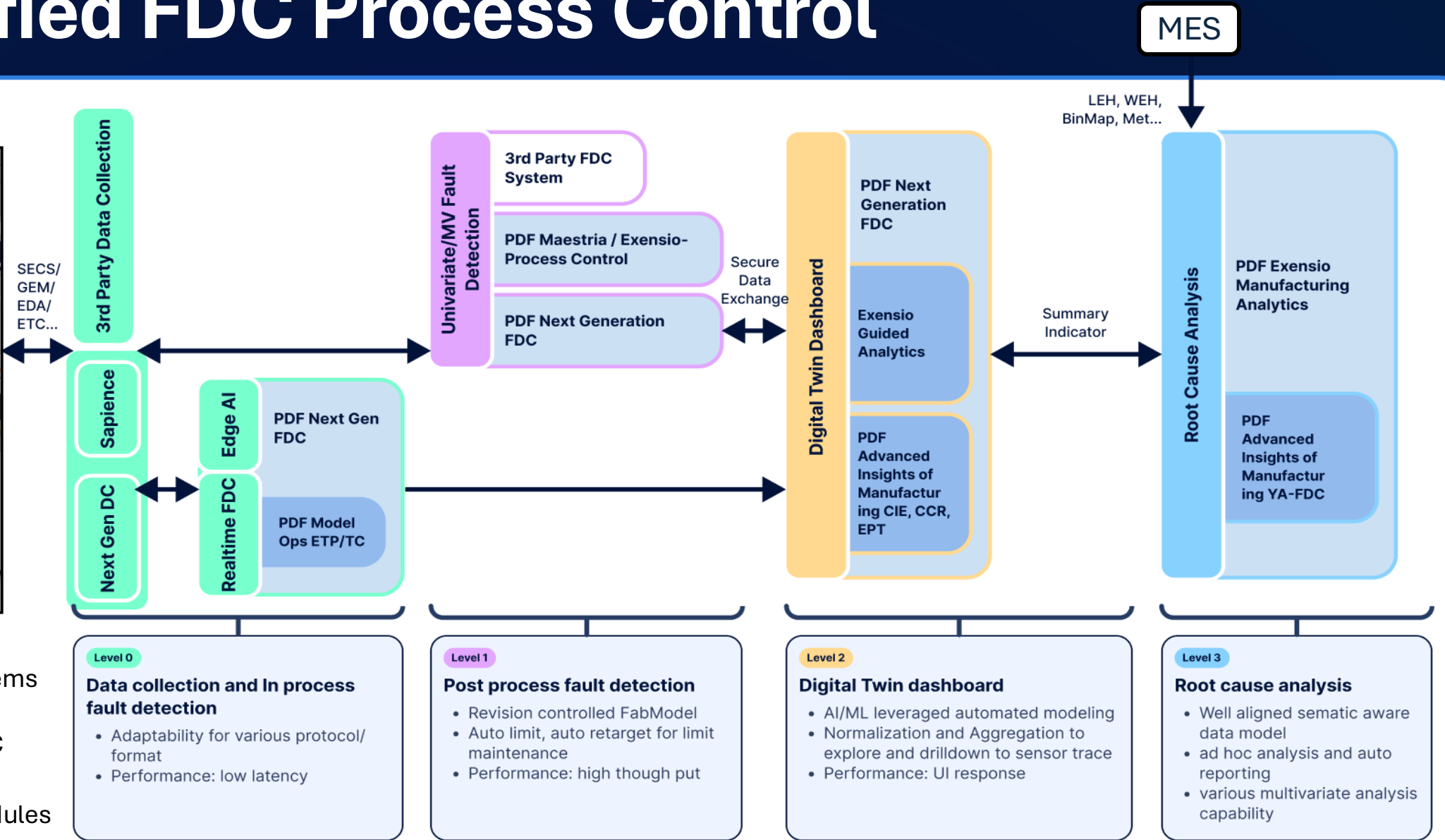
## N+2

- Whole Trace Control
- ModelOps for FDC
- Real-time FDC
- Knowledge Augmented solutions



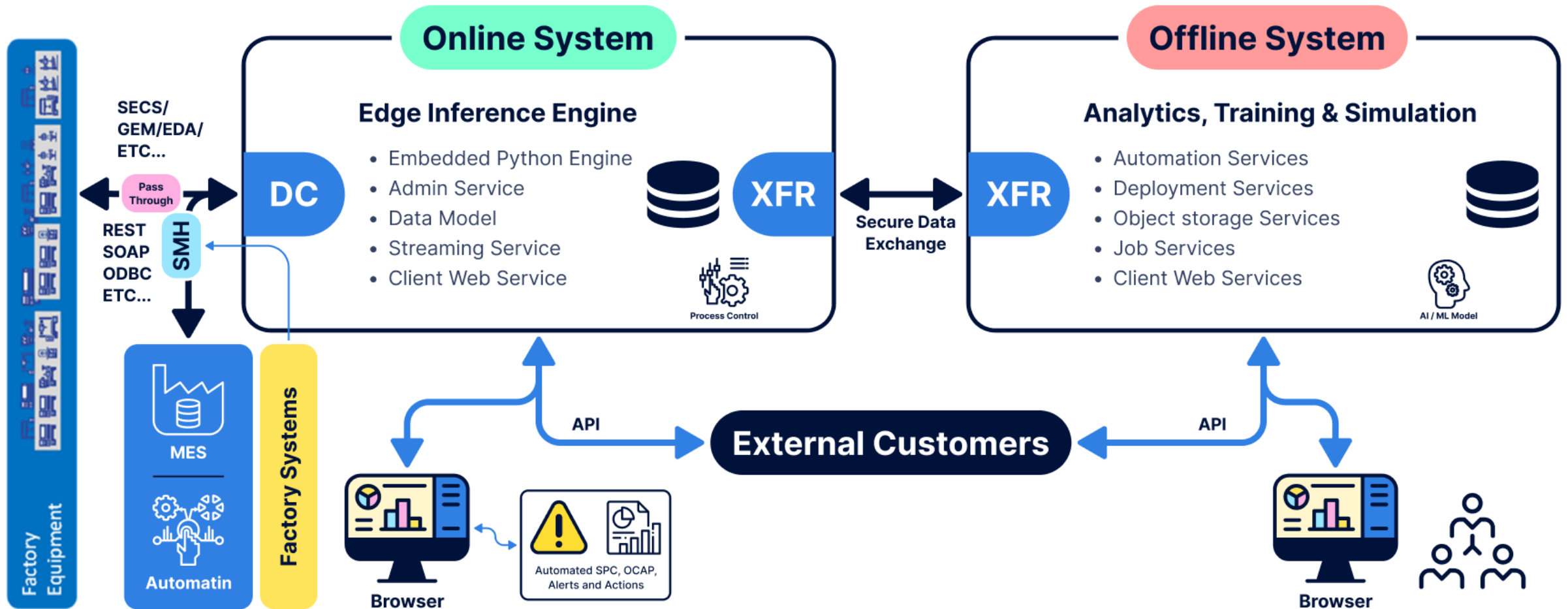


# Unified FDC Process Control



# Separation of On-prem Edge (Online) & Training (Offline) Systems

Simplified architecture diagram



# Bulk Management on Maestria or E-PC Indicators WECO/SPC Limits

Changes in Maestria Strategies will flag synchronization issues with existing WECO to be user reviewed and updated

Bulk selection of indicators across to apply WECO rules across strategies



The screenshot displays the exensio software interface, which is used for managing WECO rules and historical data. The top navigation bar includes tabs for 'Indicator Retrieval', 'Historical View', 'WECO Rules', 'Dashboard', and 'Alarm Rate'. The main content area is divided into several sections:

- Indicator Retrieval:** A table listing indicators with columns for 'Indicator T1', 'Strategy T1', 'WECO Rules T1', 'Equipment T1', 'Module T1', and 'Recipe T1'. It shows a list of indicators like 'AreaFlow\_FCS\_A0' and 'AreaFlow\_FCS\_C4F8'.
- Attaching WECO rules to Indicators:** A section with buttons for 'Attach to Indicators', 'Add Rule', 'Export Rules', and 'Import Rules'. It includes a search bar and a table of available WECO rules.
- Available WECO Rules:** A table with columns for 'Name T1', 'Type T1', 'Limit Band T1', 'Excursion Type T1', 'Failed Length', 'Run Length', 'Duration T1', 'DCQV Enabled', 'Reset On', 'Disabled', and 'Description T1'. It lists rules like '19\_OF\_35\_INCREASING\_DRIFT' and '2\_OF\_12\_INCREASING\_DRIFT'.
- Historical View:** A section with a search bar and a table showing historical data for a selected indicator. It includes columns for 'Indicator T1', 'Strategy T1', 'Equipment T1', 'Module T1', 'Recipe T1', 'DCQV T1', 'Start Time T1', 'Material T1', 'Lot T1', and 'Wafer T1'. It also shows a 'History of Limits and WECO setup' with a line graph.



Exensio Process Control configurations versioned. WECO results and alarms stored in Cassandra

Maestria Strategy Indicators / SPC Limits from MariaDB

List of Maestria strategies available extracted from MariaDB



# Enabling Guided Analytics & Dashboards In FDC



## Our Goals:

- Customization for User-Centricity
- Proactive Insights for Predictive Action
- Seamless Integration for Data Consistency

## User Experience Enhancements:



- Context-Aware Navigation
- Real-Time Notifications
- Guided Actions
- One-Click Solutions
- Visual Storytelling



## Capabilities:

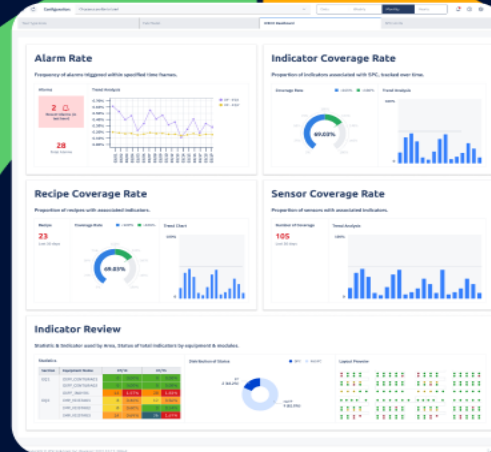
- Customizable Metrics
- Proactive vs. Reactive
- Advanced Analytics

## Usability Features:



- Intuitive Dashboard Layout
- Cross-Platform Compatibility
- User-Centric Design
- Easy Collaboration
- Quick Access to In-depth Analysis

## Enabling Guided Analytics & Dashboards in FDC



# Summary of Progress

- PDF has made progress enabling our customers to use both Maestria and Exensio Process Control to securely deploy new features, AI, and advanced solutions
  - Bulk Strategy Manager & Versioning
  - Linux Pass Through
  - WECO / SPC module for both Maestria & E PC with machine learning and automation (shift / drift, bulk deployment, etc)
  - API enhancement to support 3<sup>rd</sup> party applications
  - 3-Tier Security Enhancement
  - Dashboards & more...
- Roadmap to enable new capabilities that can be utilized by both Maestria and Exensio Process Control customers as well as 3<sup>rd</sup> party applications

# Thank You

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