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Autocene Passport

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Using Autocene Passport with IoT in
Enterprise Environments

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Autocene Passport Overview

The magic of Autocene Passport is that it breaks down processes into user-definable combinations of **Events, Inputs, Actions**, and **Outputs** that allow customers to take business process automation to a new level. Autocene Passport bots react to a chain of events by performing these micro-functions executed by specialized Autocene Passport components called Connectors and/or Adapters.

One task could produce a PDF document, while another task picks up that document to move to DocuSign® for signature. These Connecters and Adaptors enable simplified creation of workflows, events, actions, and outputs in heterogenous application environments. The result is a much lower threshold to bring in developers and the ability to rapidly offer contained interfaces with specific functionality to business users.

This approach greatly enhances the use of your existing infrastructure as Passport-based Autocene bots can now act as the single interface to a wide variety of your other enterprise applications (i.e. SAP, Oracle/PeopleSoft, Microsoft Dynamics & SharePoint). Using this method of enabling users to interact with other enterprise systems can substantially reduce licensing costs and significantly increase efficiency, productivity and adoption rates.

For clarity:
- Passport Tasks consist of Connectors and Adapters performing Events, Inputs, Actions and Outputs.
- Passport bots may consist of one or more Passport Tasks.
- These tasks can be autonomous, executed independently or chained together to perform more complex functions.

These Autocene Passport bots can connect disparate systems to each other in a similar manner. Each PASSPORT Task consists of 4 building blocks:

1) ***Event Block***: These are the triggers that wake-up the Passport Task. These can really be anything. A time of day, database event, file drop in a directory, an IoT device giving off a signal, a robot on a factory floor, or a message sent from another application.

2) ***Input Block***: An input block is the material/content to be used within the task. We use the analogy that this is like the block of metal to be shaped into certain car parts for a production line. These inputs generally consist of familiar inputs like: Blank files, JSON, XML, application messages, configuration files, etc.

3) ***Action Block***: An action block is the action required to perform in order to execute the task. Think of these as one robot putting wheels on a car, while another action / robot puts doors on the car. Passport applications can include one single action, or many actions. For every micro-application there must be one or more Action Blocks. Actions within an Action Block are executed and perform their functions in sequential order till completion.

4) ***Output Block***: An output block states the output of what is being produced at the end of the chain of action blocks. Again, these outputs could be almost anything--a PDF file, an XML file, application message, email, etc. For every bot there must be one Output Block.

Autocene Passport enables customers to use these bots for a wide range of applications including:

- **AUTOMATED DOCUMENT CREATION:** Allow users to enter data into a form, allow that data to be reviewed by designated users, then integrate the form data into a word processing system, such as Microsoft Word, and deliver the document to the users ready to be sent to customer.
- **AUTOMATED DATA INTEGRATION WITH OTHER SYSTEMS:** Monitor the Autocene SQL Server database for data meeting customer-specified conditions. When the condition is met, a Passport Task can integrate form data into the customer's other enterprise systems, such as ERP's CRM's, HRIS, Ticketing Systems, Document or Content Management System.
- **AUTOMATED REPORT GENERATION AND DELIVERY:** Autocene Passport can automatically create reports based on the customers specifications and requirements and deliver those real-time reports to various users without the need for human intervention.
- **AUTOMATED WORKFLOW INITIATION:** Allows new workflows to automatically launch based upon specific occurrences within other systems. Examples could include monitoring a temperature sensor and automatically initiating a new workflow when the temperature variances exceed pre-determined levels.
- **CAPTURE AND ESCALLATION OF INCOMING EMAIL:** Monitoring specified email accounts to determine if arriving emails meet specified parameters. In which case, the bot will parse the email content into specific elements and automatically route the email content based upon customer-specified rules.
- **AUTOMATE DOCUMENT STORAGE AND ARCHIVING:** Enables workflows that include attachments to store these attachments in an alternate location, such as a Document or Content Management system, an alternate enterprise application, a simple file share location, and others.
- **AUTOMATED DOCUMENT TRANSFORMATIONS:** Allows for complex document transformations, aggregations, reformatting etc.
- **GENERAL AUTOMATED MONITORING AND SUPERVISORY:** Allows for reacting to the certain events in a monitored environment, executing and performing specific predefined activities.

Autocene has worked with IT Architects and Business users to include and perfect the functionality required to make rapid deployment and day to day use by the business of these bots. Passport functionality includes:

- **SERVICE MANAGEMENT AND CONFIGURATION UI:** Configurability is one of the key features of Passport, allowing custom configurable adapters. The connector framework provides a pluggable architecture where custom adapters can be introduced dynamically.
- **DATA PROTECTION:** Encryption and decryption for configurable text values is provided as part of the connector data protection services.

- **EVENT NOTIFICATION AND SCHEDULING:** Connector modules can subscribe to an event notification service that will allow them to run and execute their desired task in a scheduled fashion.
- **PERSISTENT CONNECTOR CONFIGURATION:** The persistency of connector configuration is provided by the connector configuration. Any configurable component is written into a file where it is then configured using the Connector Task Configuration user interface.
- **INPUT AND OUTPUT POINTS IMPLEMENTATION:** Default implementations for reading an input from a file and writing an output into a file are included with the connector framework. Custom connector adapters can also provide extended implementations for different types of input and output mechanisms.
- **LOGGING:** Autocene Passport provides a mechanism for automated file logging.
- **XSLT TRANSFORMATION ACTION:** AUTOCENE PASSPORT provides default implementation for an XSLT based transformation action.

In addition, Autocene Passport is and works as a multi-tenant environment, and all Passport configurations are transferrable through exchange of the XML configuration files. Autocene Passport configurations can be stored within an SQL database. Autocene Passport Adapters process and exchange messages based on an XML data stream. Finally, Autocene Passport can be delivered as components of the Autocene WebAdmin (Web Application) or as a Windows Service.

Passport and The IoT Environment

IoT environment is built around the sensors/detectors of various type and origin, and encompasses both hardware and software components. Currently there are number of sensors and detectors directly supported for example in radiation detectors category following sensors are supported: ADM-30, GR-135, GR-150, iCam, 6150AD etc.

Complex IoT devices typically require an intermediary communication protocol between MCU (Micro Controller Unit) residing in a Control Box, and attached and supported sensor. Usually this functionality is delivered as a Firmware which is cyclically executed by MCU.

The communication part of Firmware program is mainly responsible for:

1. Establishing hardware communication with detector;
2. Monitoring the status and communication activity;
3. Passing commands to detector;
4. Passing responses from detector;
5. Partial recognition of the raw data structure received from detector;
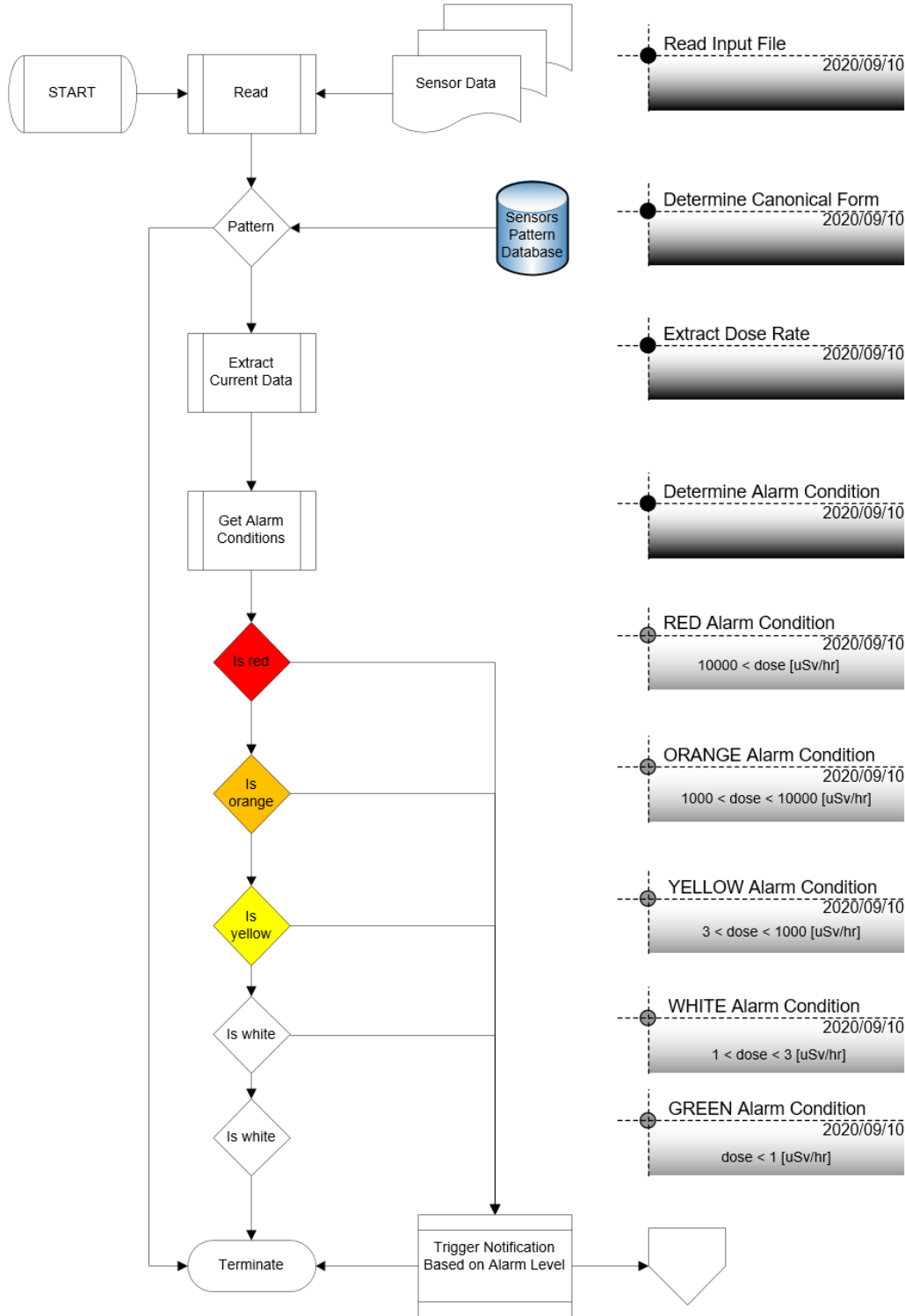6. Wrapping received data into an acceptable format (XML, CSV, JASON);

The IoT environment with computational capabilities is built around SW/HW capable to dynamically pair sensor/detector with the proper communication protocol, signal pattern and baseline data structure by applying 4 computational phases:

1. PROBING - Probing any sensor/detector with the known probing patterns;
2. DISCOVERY - Analysing response from sensor/detector and identifying sensor/detector by comparing to the set of known sensor/detector response patterns;
3. RECONFIGURATION – potentially dynamic reconfiguration of the MCU control box and other required components;
4. APPLICATION - Applying automatically identified sensor communication protocol, and data structures to standard device operation;
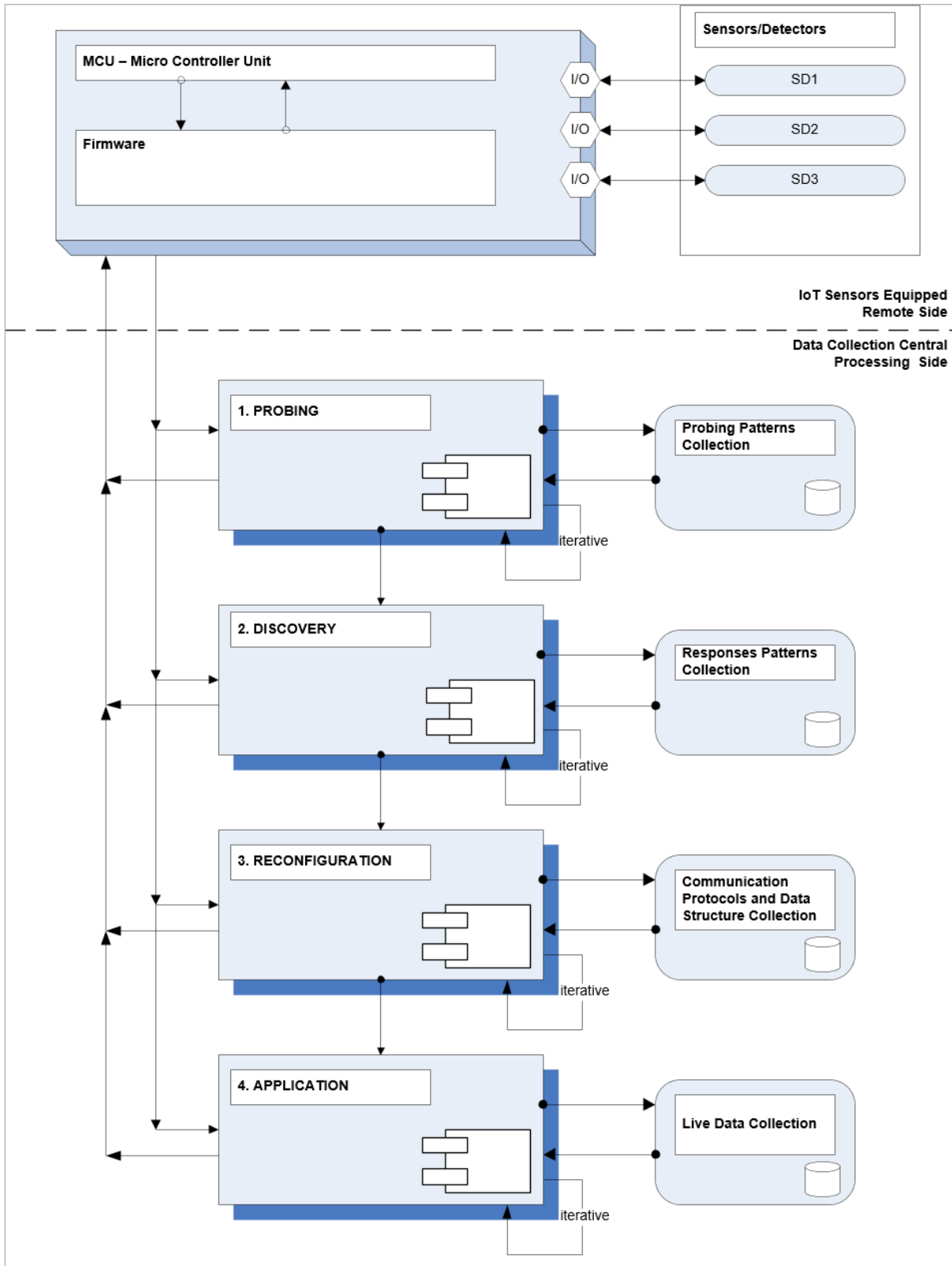
Point 4 – APPLICATION – above is critical to the Live Data Collection and potential for the Autocene Passport to enable workflows depending on the requirements and specific business patterns.

In example below the environmental data from IoT enabled Radiation Monitoring Sensors is collected and processed in NRT (Near Real Time), enabling different Notifications depending of the established alarm Conditions and Patterns.

START → Read ← Sensor Data

| | Read Input File | 2020/09/10 |

Pattern ← Sensors Pattern Database

| | Determine Canonical Form | 2020/09/10 |

Extract Current Data

| | Extract Dose Rate | 2020/09/10 |

Get Alarm Conditions

| | Determine Alarm Condition | 2020/09/10 |

Is red

RED Alarm Condition
2020/09/10
10000 < dose [uSv/hr]

Is orange

ORANGE Alarm Condition
2020/09/10
1000 < dose < 10000 [uSv/hr]

Is yellow

YELLOW Alarm Condition
2020/09/10
3 < dose < 1000 [uSv/hr]

Is white

WHITE Alarm Condition
2020/09/10
1 < dose < 3 [uSv/hr]

Is white

GREEN Alarm Condition
2020/09/10
dose < 1 [uSv/hr]

Terminate ← Trigger Notification Based on Alarm Level →

Triggered Notifications in the processing environment may be used to trigger specific Applications, Workflows etc.

The IoT based system can be used to control and monitor environment under surveillance. Typically, such an environment is more complex and can contain a specialized processor (PLC, CPU, etc.) as well as sort of Data Queue processing capabilities and eventually Data Storage with various channels capable of accessing the Sensors Data in Real Time or Post-Mortem.

Here is a conceptual Diagram of such data collection and access environment.
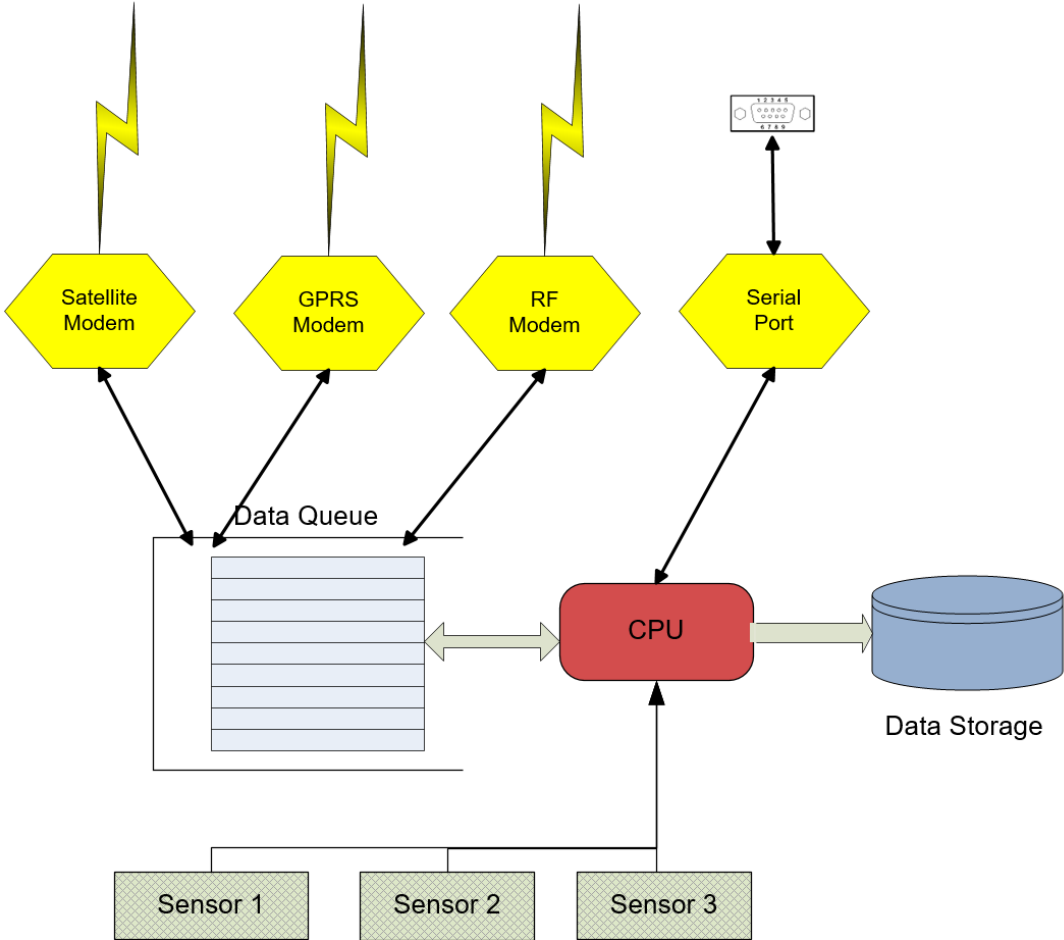
Conclusion

Autocene removes long-standing barriers to enterprise-adoption of bots and the use of IoT sensors. Using Passport's low-code approach, Autocene bots can be quickly imagined, prototyped, tested and deployed, fundamentally changing the culture of an organization. IT departments can offload the creation, care and feeding of certain workflows to the business users—freeing IT to develop and deploy more high-value projects. Permission to imagine and create Passport Tasks enable business users to micro-innovate. With the right tools, the sum of these micro-innovations can be world-changing.

Discover Autocene

Autocene Enterprise Automation Platform give customers the flexibility of a Code-Free Application Development Platform, combined with the power of an Intelligent Process Automation solution. It gives enterprises the ability to rapidly deploy fully configurable Autocene applications that are capable of automating even the most complicated business processes.

Autocene improves productivity by automating both high value, mission critical processes and eliminating time consuming repetitive tasks. **Autocene** makes both Attended, Semi-Attended & Unattended automations easy, freeing end users and adding value to your organization's critical processes & bottom line.

Autocene Passport bidirectionally integrates data with any of your existing Enterprise applications & databases (On-Premise or Cloud Hosted). Data can seamlessly travel to and from multiple disparate systems and/or **Autocene** applications, monitoring databases and automating integrations, centralizing data for end users & eliminating time-consuming manual data entry.