LVI AG
Amriswilerstr.41
CH 8570 Weinfelden
www.lvi-ag.ch

E(i)xM

Enterprise (intelligent) xM = Module Management Platform

Partner Information Document

LVI AG – Weinfelden, Switzerland
www.lvi-ag.ch

Foreword

The evolution of E(i)xM into a modular enterprise intelligence platform would not have been possible without strong strategic collaboration in the fields of Artificial Intelligence and architectural design.

We would like to express our sincere gratitude to **Prof. HN Shankar** for his enormously important strategic contribution to the conceptualization and development of the AI and system design foundations underlying E(i)xM.

His guidance in aligning advanced AI methodologies with practical enterprise architecture principles has significantly influenced the structural direction of the platform. The integration of intelligent analysis, structured data modeling, and scalable architectural patterns reflects insights that emerged through this collaboration.

In particular, the development of:

- AI-ready data structures
- Modular intelligence layering
- Predictive modeling foundations
- Cross-domain analytical design principles

was made possible through his strategic input and academic perspective.

Without his support and intellectual partnership, the necessary conceptual groundwork for integrating AI into a governance-oriented enterprise platform could not have been established in its current form.

We extend our deep appreciation for his collaboration and continued engagement in shaping the technological and strategic direction of E(i)xM.

LVI AG
Amriswilerstr.41
CH 8570 Weinfelden
www.lvi-ag.ch

1. Executive Summary

E(i)xM is a modular, containerized enterprise monitoring and optimization platform designed to integrate operational monitoring, SAP supervision, database optimization and AI-driven analytics into a unified ecosystem.

The platform is built to:

- Operate & Monitor complex IT landscapes (SAP, DB, infrastructure)
- Aggregate operational data centrally
- Provide intelligent analysis using AI
- Enable partners to build scalable customer projects

E(i)xM is not a single tool — it is a **framework of interoperable modules**:

- **PILOTAGE** – Operational cockpit & visualization
- **AI Module** – Intelligent analysis engine
- **SAP MONI** – Deep SAP monitoring & data collection framework
- **DB Optimizer (DBO)** – Database optimization & structured execution engine

Each module can operate standalone but is designed to create significantly more value when combined.

2. Platform Architecture Overview

E(i)xM is based on a unified, containerized architecture:

- Docker-based deployment
- Reverse proxy with automatic SSL (Let's Encrypt)
- SQL database with backup & point-in-time recovery
- JWT-based authentication
- Centralized license management
- REST-based services
- Runs on Windows & Linux
- Deployable on-prem or cloud

(See SAP MONI Appendix A – Container architecture)

This allows:

- Simple partner rollout
- Clear edition separation
- Version & maintenance control via license
- Non-exclusive distribution model

3. Module Overview & Functional Role

3.1 E(i)xM PILOTAGE

Operational Control & Visibility Layer

PILOTAGE acts as the operational cockpit of the platform.

Core Capabilities

- Dynamic dashboards and schedulers
- Execution of IT tasks on LINUX & WINDOWS systems
- Aggregation of alerts and escalation states
- Cross-system operational grouping
- Customizable views (by company, service, severity, etc.)
- Drill-down and acknowledgement workflows
- KPI-based operational overview

Role in the Ecosystem

PILOTAGE is the visualization and orchestration layer that:

- Consolidates outputs from SAP MONI, any NMS, DB Optimizer and AI
- Integrates DB Optimizer results
- Displays AI analysis results
- Acts as central control panel for operations

It is also the module that integrates background job execution (Hangfire concept) used by DB Optimizer.

3.2 E(i)xM AI Module

Intelligent Data Analysis & Decision Support

The AI module evolved from V1 → V3 and is designed to integrate Large Language Models (LLMs) with operational data.

Functional Concept

- Multi-source data ingestion (CPU, Disk, Memory, Logs, Tickets…)
- Flexible time-range aggregation
- Two-step dialogue interface:
  - System context
  - User prompt
- Multi-provider AI support:
  - OpenAI
  - Google Gemini
  - Mistral
- Configurable parameters (temperature, model, tokens)

Architecture Characteristics

- Token-efficient aggregation logic
- Modular provider structure
- Secure API key handling
- Structured GUI workflow

Strategic Role

The AI module transforms monitoring data into:

- Root cause insights
- Correlation analysis
- Predictive risk indications
- Prioritized recommendations

It includes:

- AI meta-evaluation (“AI Judge”)
- Deeper SAP & DB integration
- Predictive anomaly modeling

AI becomes significantly stronger when fed by:

- SAP MONI sensor data
- DB Optimizer execution results
- PILOTAGE event streams

3.3 E(i)xM SAP MONI

Deep SAP Monitoring and Data-Collection Framework

SAP MONI is a modern SAP framework fully integrated into E(i)xM.

Key Characteristics

- Direct SAP RFC integration (ABAP-based) supporting SAP RISE private cloud, too
- No reliance on unstable web portals
- Real-time data retrieval
- Unlimited SAP instances
- REST API service
- Works with RISE, on-prem, hosted

Monitoring Scope

Includes:

- Certificates (STRUST)
- Dialog performance (ST03N)
- IDOCs (BD87)
- RFC connections (SM59)
- Short Dumps (ST22)
- Spool (SP01)
- Syslog (SM21)
- Users
- Batch jobs (SM37)
- Workflow monitoring
- Work process monitoring (SM50)
- Buffer statistics (ST02)
- DB Monitoring (ST04)
- SAP HANA metrics (via DB Optimizer)

Competitive Positioning

Compared to classical CCMS solutions:

- More real-time capable
- Template-based
- More reliable data extraction
- Direct SAP access
- Unified integration into E(i)xM

Strategic Value

SAP MONI generates structured, high-quality operational SAP data.

When combined with AI:

- Early detection of instability patterns
- Cross-correlation with DB layer
- Predictive risk modeling

3.4 E(i)xM DB Optimizer (DBO)

Database Execution & Optimization Engine

DB Optimizer is the evolution of former S-IMS & DB PlugIn solutions.

Core Concept

- Integration of proven maintenance scripts
  - Brent Ozar
  - Ola Hallengren
- Scheduler-driven execution
- Structured logging & protocol storage
- Result verification queries
- Export to NMS (for example ZABBIX / PRTG)
- MSSQL & SAP HANA initially (extensible to other DBMS)

High-Level Workflow

1. Download or update input queries
2. Assign to scheduler
3. Execute
4. Run validation query
5. Store results in protocol
6. Display in PILOTAGE
7. Export to NMS if required

Additional Scope

- IT Asset Management (intermediate solution)
- Inventory integration
- Logging for rollback decision support
- AI-ready structured result storage

Strategic Position

DBO moves from passive monitoring to:

- Active optimization
- Controlled change execution
- Measurable improvement tracking

AI can later evaluate optimization success trends.

3.5 Project Management & Reporting Modules

Expanding E(i)xM from Monitoring to Operational Governance

While SAP MONI, DB Optimizer, PILOTAGE and AI focus on technical monitoring and optimization, E(i)xM also provides structured modules for **organizational control, project transparency, and commercial reporting**.

These modules extend E(i)xM from a technical intelligence platform to a broader **enterprise coordination and reporting framework**.

Included modules:

- AgileBoards – Projects & Teams
- TimeKeeping & Scheduler
- Customer / Creditor / Debitor Reports

Together, they create a structured layer for:

- Project organization
- Team transparency
- Time and availability management
- Commercial data visibility
- Cross-functional reporting

3.5.1 E(i)xM AgileBoards – Projects & Teams

Structured Collaboration & Transparent Project Execution

AgileBoards provides a structured and visual framework for managing:

- Groups
- Teams
- Users
- Projects
- Responsibilities

Core Capabilities

- Centralized workspace for teams and project structures
- Status-driven workflows for project tracking
- Role-based user assignment
- Interactive boards for task allocation and responsibility tracking
- Transparent progress and ownership visibility

Organizational Structure Model

AgileBoards follows a structured hierarchy:

Group → Team → User → Project/Task

This ensures:

- Clear access control
- Defined accountability
- Cross-department scalability
- Consistent navigation between organizational layers

Strategic Role in the Ecosystem

AgileBoards complements the technical modules by:

- Structuring operational responsibility for SAP MONI alerts
- Assigning DB optimization tasks to specific teams
- Tracking AI-recommended actions

- Managing project-based SAP/DB transformation initiatives

It transforms technical findings into executable, trackable project activities.

3.5.2 E(i)xM TimeKeeping & Scheduler

Enterprise Time & Availability Management

TimeKeeping & Scheduler provides structured management of:

- Working times
- Absences
- Availability
- Planned activities

Core Capabilities

- Centralized overview of time records and planned activities
- Intuitive management of holidays, absences and availability
- Automatic synchronization across user and team calendars
- Full planning transparency across organizational levels

Operational Integration

The Scheduler integrates with:

- Teams and user structures from AgileBoards
- Master data structures (including SAP integration where required)
- Planning-related entities across E(i)xM

This allows:

- Transparent shift planning
- Resource-based project allocation
- Reduced administrative overhead
- Clear visibility of operational capacity

Strategic Value

For partners, TimeKeeping & Scheduler enables:

- Structured service delivery planning
- Managed service transparency
- SLA-oriented resource planning
- Integration into larger operational governance projects

It ensures that project management is backed by real resource availability.

3.5.3 E(i)xM Customer / Creditor / Debitor Reports

Commercial Transparency & Financial Reporting

This module consolidates customer, vendor and debtor data into a unified reporting structure.

Core Capabilities

- Centralized access to customer, vendor and debtor information
- Structured reporting across entities and accounting dimensions
- Integration of invoice, article and master data views
- Customizable data slicing for operational and strategic insights

Reporting Structure

Supports structured drill-down models such as:

Company → User → Invoice → Article

This enables:

- Detailed transaction visibility
- Role-based reporting
- Multi-dimensional financial analysis

Strategic Role in the Ecosystem

Customer/Creditor/Debitor Reports extend E(i)xM into:

- Commercial project reporting
- Service contract analysis
- Invoice-based performance tracking
- Cross-entity financial oversight

When combined with:

- AgileBoards → project structure
- TimeKeeping → resource allocation
- SAP MONI / DB Optimizer → technical metrics

E(i)xM enables alignment between:

- Technical performance
- Project execution
- Resource consumption
- Commercial impact

3.6 E(i)xM Inventory & Ticket Integration

Integrated Asset Intelligence & Service Control Layer

The needed inventory module and eMail connector is under development and planed release date is QIII 2026

Strategic Expansion of the E(i)xM Platform

With the upcoming Inventory & Ticket Integration capabilities, E(i)xM evolves from a monitoring and optimization framework into a structured IT Service Governance platform.

This extension creates a digital mirror of the IT infrastructure by:

- Synchronizing assets from monitoring systems (PRTG, Zabbix, Nagios, etc.)
- Structuring devices, sensors, customers and services
- Integrating ticket lifecycle management
- Enabling SLA-oriented service tracking
- Preparing structured data for AI-based analytics

This module connects technical monitoring, operational responsibility, and business impact in one unified data model.

3.6.1 Purpose & Positioning in the Ecosystem

The purpose of E(i)xM Inventory & Ticket Integration is to:

- Capture infrastructure components and their operational status
- Detect deviations, warnings and missing entities
- Automatically generate and manage tickets
- Track issues through resolution within SLA scope
- Provide structured, AI-ready data layers

This module acts as:

The structural backbone between monitoring tools and operational governance.

It integrates tightly with:

- PILOTAGE (task & ticket handling)
- AgileBoards (responsibility & workflow control)
- AI Module (predictive & correlation analytics)
- Reporting modules (service & commercial evaluation)

3.6.2 Inventory Data Model & Synchronization Logic

Digital Infrastructure Mirror

E(i)xM models infrastructure entities such as:

Company → Group → Service → Host → Sensor → Ticket

The inventory system synchronizes data via API from external NMS systems.

Synchronization Characteristics

- Default sync interval: 24 hours
- But highly configurable to any wished schedule
- Optional near-real-time via webhook/API triggers (based on integrated enterprise workload automation and orchestration platform)
- Sync frequency definable per device or service criticality

Synchronization is orchestrated by the **PILOTAGE Scheduler**, ensuring consistent governance control.

3.6.3 Data Collection & Storage Logic

E(i)xM aggregates and structures monitoring data for governance, analytics and prediction.

Data Aggregation Model

Instead of storing every raw sensor value, the system stores:

- Maximum value
- Minimum value
- Average value
- Time range reference
- ….

This allows:

- Trend analysis
- Predictive modeling
- Storage efficiency
- Long-term data retention

Data Retention Policy

Default retention:

- Up to 10 years (configurable)

Archiving logic:

- Inactive assets are archived
- Archived assets remain recoverable
- Automated deletion rules configurable

This enables long-term historical analysis and AI-based forecasting.

3.6.4 Change Detection & Status Classification

One of the core enhancements is structured change detection.

Devices and sensors receive dynamic state tagging:

- **New** – exists in NMS but not yet in E(i)xM
- **Missing** – existed before but no longer reported
- **Updated** – metadata changed (IP, name, tags, ownership)
- **No Data** – present but without monitoring feed
- **Inactive** – offline for defined threshold
- **Archived** – long-term inactive but historically preserved

Missing devices are flagged after defined time threshold (e.g. 30 days before archival suggestion).

Users can:

- Manually refresh device data
- Ignore specific alerts (e.g., backup systems)
- Trigger reconciliation processes

This structured change model ensures governance transparency.

3.6.5 Validation & Data Quality Control

Validation ensures that inventory data is consistent and assignable.

Validation checks include:

- Valid device name & ID
- Customer assignment
- Service group assignment
- IP and metadata completeness
- Tag consistency (based on organizational data dictionary)

If validation fails:

- Device flagged in UI
- Assignment correction required

- Audit trail logged

This guarantees clean structured data for:

- AI processing
- SLA tracking
- Responsibility mapping

3.6.6 Assignment & Responsibility Mapping

Devices are mapped to:

- Customer
- Service Group
- Service Owner (automatically linked to team)

Team mapping occurs automatically via service ownership.

Enhancements:

- Display all available NMS tags
- Suggest customer/service based on historical patterns
- Allow inline creation of new customer/service entities
- Maintain strict access control

This integrates directly with:

- AgileBoards → operational workflow
- TimeKeeping → resource planning
- Reporting → commercial accountability

3.6.7 Ticket Lifecycle Integration

E(i)xM integrates with monitoring and ticketing systems through:

- API ingestion
- Email Snatcher (structured email parser)
- Webhook events

Ticket Workflow (Based on ITSM Capability Model)

1. Monitoring tool detects incident
2. Email/API event triggered
3. E(i)xM Email Snatcher parses structured content
4. Ticket created in E(i)xM Ticket database
5. Ticket mapped to:
    - Inventory entity
    - Customer
    - Service group
    - Responsible team
6. Ticket visualized in:
    - PILOTAGE (AgileBoards)
    - TASKS
7. Status updates logged with timestamp
8. Automatic closure if recovery event detected

When monitoring system signals recovery:

- System identifies open ticket
- Marks ticket as resolved
- Logs resolution duration

This creates:

Detection → Ticket → Task → SLA Tracking → Closure → Analytics

3.6.8 SLA Tracking & Performance Analytics

The system tracks:

- Ticket open-to-close duration
- Recurring device incidents
- Service impact frequency
- Long-running unresolved tickets

Generated action-driven reports include:

- Device Health Report
- Missing Device Report
- Service Impact Report
- Utilization Trend Report
- Resolution Time Analytics

This enables:

- SLA compliance verification
- Capacity planning
- Service quality measurement
- Customer transparency

3.6.9 Predictive Analytics & Proactive Maintenance

The structured inventory and ticket history create a foundation for:

- Trend-based anomaly detection
- Predictive failure alerts
- Correlation between performance and ticket history
- AI-driven root cause suggestions

Example:

If CPU utilization trends upward over multiple days
AND ticket frequency increases
→ AI recommends preventive maintenance before outage occurs.

This transforms E(i)xM from reactive monitoring into: Proactive Service Governance.

3.6.10 Discovery & External Integration Options

E(i)xM supports integration with:

- Zabbix & PRTG (API-based discovery)
- Nmap + SNMP layers
- Naabu / Masscan for high-speed discovery
- Open-source SNMP libraries
- NetBox (optional frontend integration)

PILOTAGE can (based on integrated scheduler functionality):

- Trigger subnet scans
- Receive webhook events
- Normalize discovered hosts
- Deduplicate via device keys
- Insert/update inventory schema

Discovery Model:

Scan → Identify → Normalize → Assign → Validate → Store → Monitor

This makes E(i)xM inventory independent from a single NMS vendor.

3.6.11 Strategic Value for Partners

For partners, this expansion enables:

- IT Service Management projects
- Managed Service Provider (MSP) offerings
- SLA-backed monitoring contracts
- Infrastructure transparency services
- AI-driven service optimization packages
- Governance consulting engagements

It bridges:

Technical Monitoring

- Operational Workflow
- SLA Tracking
- Predictive Intelligence
- Commercial Reporting

into a single modular ecosystem.

3.6.12 Position Within the Overall E(i)xM Architecture

With the Inventory & Ticket Integration, the platform stack becomes:

1. Monitoring Layer → (PRTG / Zabbix / others)
2. Synchronization Layer → Inventory & Ticket Engine
3. Execution Layer → PILOTAGE / AgileBoards
4. Optimization Layer → DB Optimizer
5. Intelligence Layer → AI Module
6. Reporting Layer → Commercial & Service Reports

This transforms E(i)xM into:

A modular IT Service Intelligence & Governance Platform.

4. How the Modules Work Together

The real value emerges when modules operate in combination.

Data Flow Overview

SAP MONI → structured SAP operational data
DB Optimizer → execution + performance result data
Infrastructure Metrics → CPU, Disk, Memory
All aggregated in → E(i)xM Core DB
Displayed via → PILOTAGE
Analyzed via → AI Module

Example Integrated Scenario

1. SAP dialog times increase.
2. SAP MONI detects SLA deviation.
3. DB Optimizer identifies index fragmentation.
4. Maintenance job executed.
5. AI correlates:
    - CPU spikes
    - DB statistics
    - SAP workload
6. AI recommends structural change.
7. PILOTAGE visualizes improvement.

This creates a full lifecycle:

Monitoring → Optimization → Validation → Intelligence

5. Editions & Partner Model

The business model is modular and non-exclusive.

Free Edition

- Limited usage
- Registered download
- PILOTAGE (restricted)
- SAP MONI (limited sap instances)
- DB Optimizer (limited dbms instances)
- No AI features
- No maintenance entitlement

Purpose:

- Entry point
- Partner lead generation
- Ecosystem expansion

Maintained Edition (Partner Edition)

Delivered to partners.

Includes:

- Updates
- New features
- Maintenance
- Implementation support
- Technical documentation
- Module-based licensing

Revenue Model:

License-based fee per unit:

- AI: per user
- SAP MONI: per SAP instance

- DB Optimizer: per DB instance
- PILOTAGE: per user

Partners build their own:

- Service packages
- Consulting projects
- Operational contracts

6. Deployment Model for Partners

Partners receive:

- Docker images
- Docker Compose configuration
- License-based activation
- Documentation
- Technical onboarding

The system can be:

- On-prem
- In partner cloud
- Customer cloud
- Hybrid

7. Strategic Positioning for Partners

E(i)xM enables partners to create:

- SAP optimization projects
- DB performance programs
- AI-based root cause analysis services
- Operational monitoring services
- Managed SAP supervision offerings
- Hybrid monitoring & consulting bundles

It is intentionally non-exclusive to:

- Encourage regional partnerships
- Enable specialization
- Avoid channel conflict
- Support ecosystem growth

8. Roadmap Direction

Future expansion areas:

- AI
  - judge meta-model
  - based change impact assessment
  - meta-evaluation layer helps troubleshooting based on inhouse knowledgebase by using GenAI & RAG based documentation
- Predictive anomaly detection
- Expanded DBMS support
- Advanced topology mapping, provides capability to map Inventory items to business processes which helps in assessing impact
- Responsibility mapping to individuals and team lead to enable self-assessment of performance
- Cross-customer benchmarking (optional future model)

9. Summary

E(i)xM is much more than a classical monitoring tool.

It is:

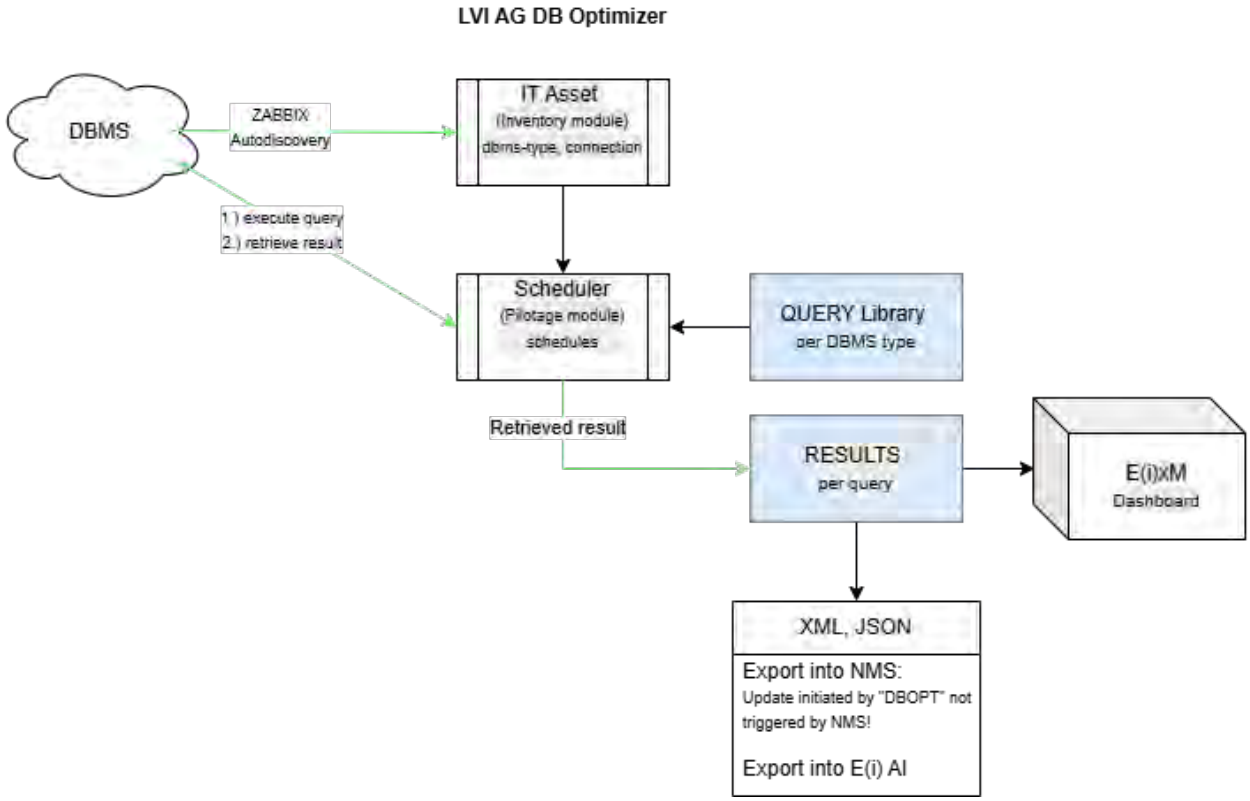
A modular enterprise intelligence framework
combining monitoring, execution, optimization and AI.

For partners, it offers:

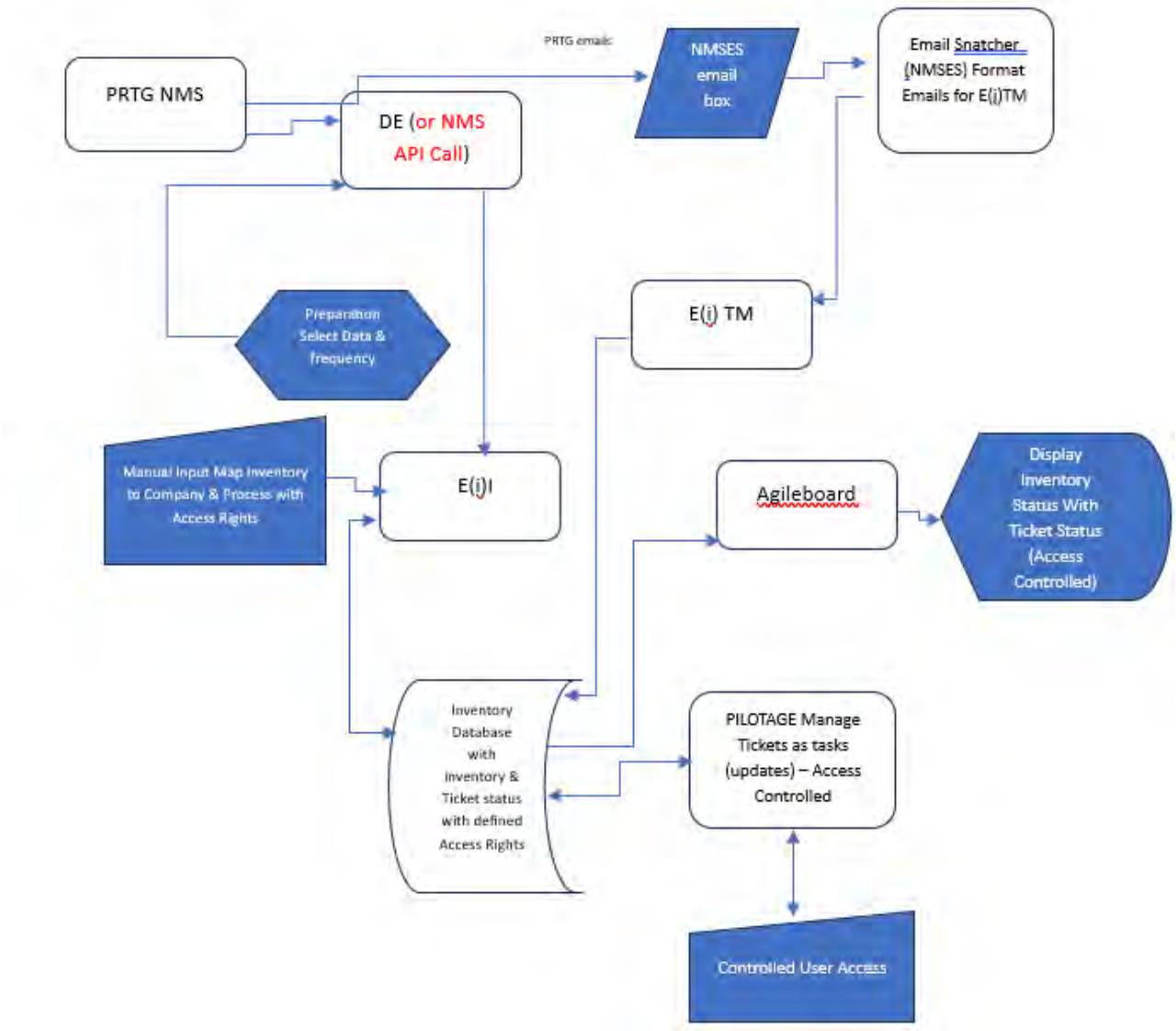
- Technical depth
- Modular revenue streams
- High project scalability
- Strong differentiation
- Clear architectural logic
- Controlled edition structure

Appendix

Integrated enterprise workload automation and orchestration platform



Ticket Workflow



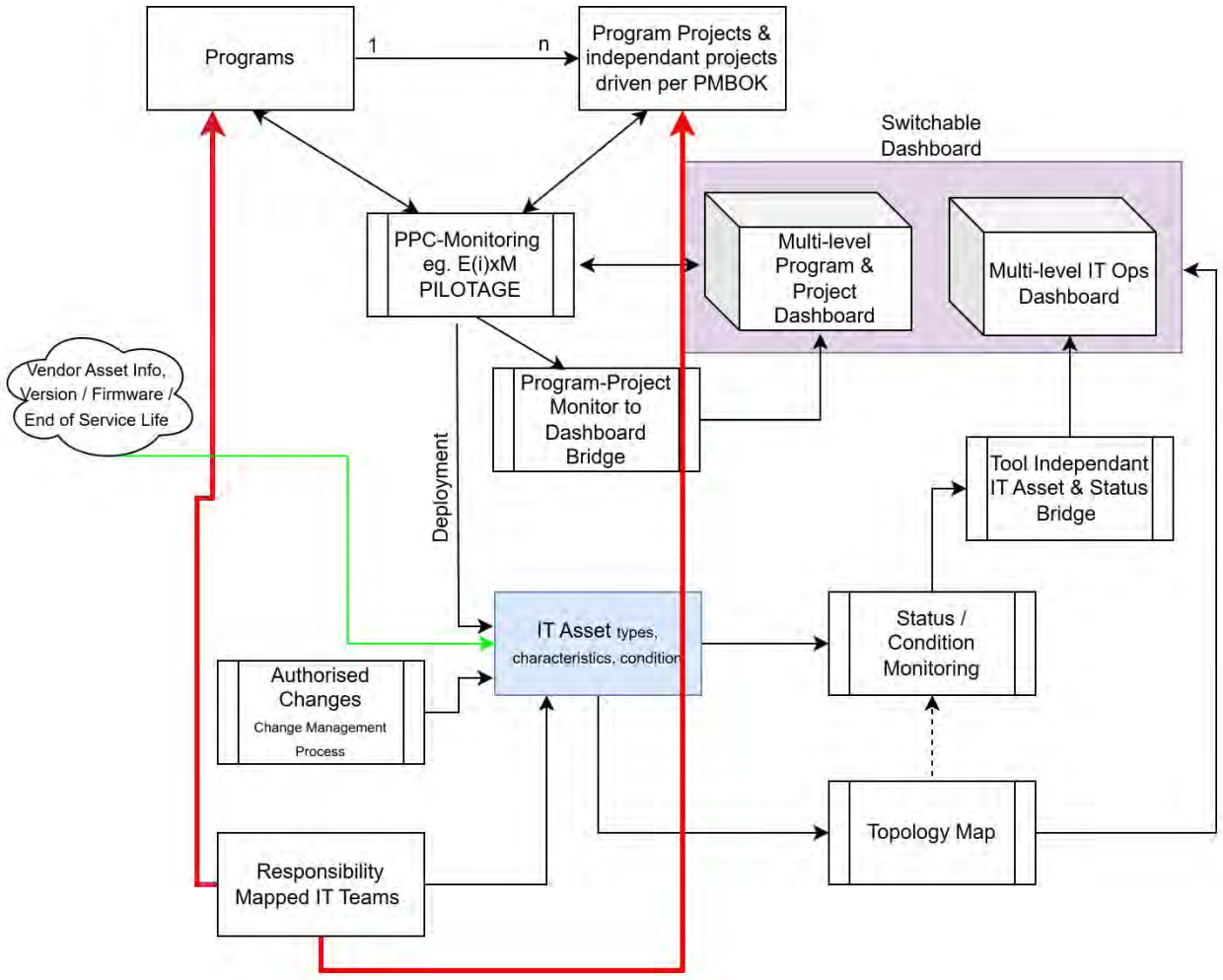
LVI AG
Amriswilerstr.41
CH 8570 Weinfelden
www.lvi-ag.ch

E(i)xM Service Management Capability

LVI AG IT Service Management Capability

At LVI AG we bring the richness of our experience to establish and manage IT service by using inhouse developed tools that integrate and orchestrate existing solutions in Network Monitoring and COTS components to create an Integrated Service Management. We do this by capturing required data, draw insights present dashboards for action and monitoring to meet SLA.

E(i)xM Asset Management Workflow



E(i)xM Inventory data