Dynamics AX Performance Audit & Benchmarking Services

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Sonata Software – Who we are

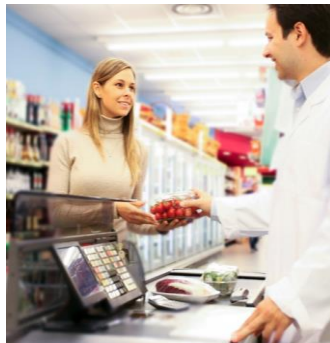| The Company	30+ YEARS as a IT Solutions Provider	400 M USD+ REVENUE p.a., 15% 3 Yr CAGR	3000+ TEAM across US, EU, Asia & ANZ	SEI CMMI L5, ITIL & ISO certified

What we do - Platform-led Digital Business Transformation

Industry-specific IP / Solution and expertise

Industry Focus

Retail and Distribution
- Hyper
- Groceries
- Apparel
- Consumer Goods

Travel
- OTA
- TO
- Corporate
- Air
- Rail

Software Providers
- ERP
- SCM
- Travel
- Retail

D365 Ready Live on Appsource

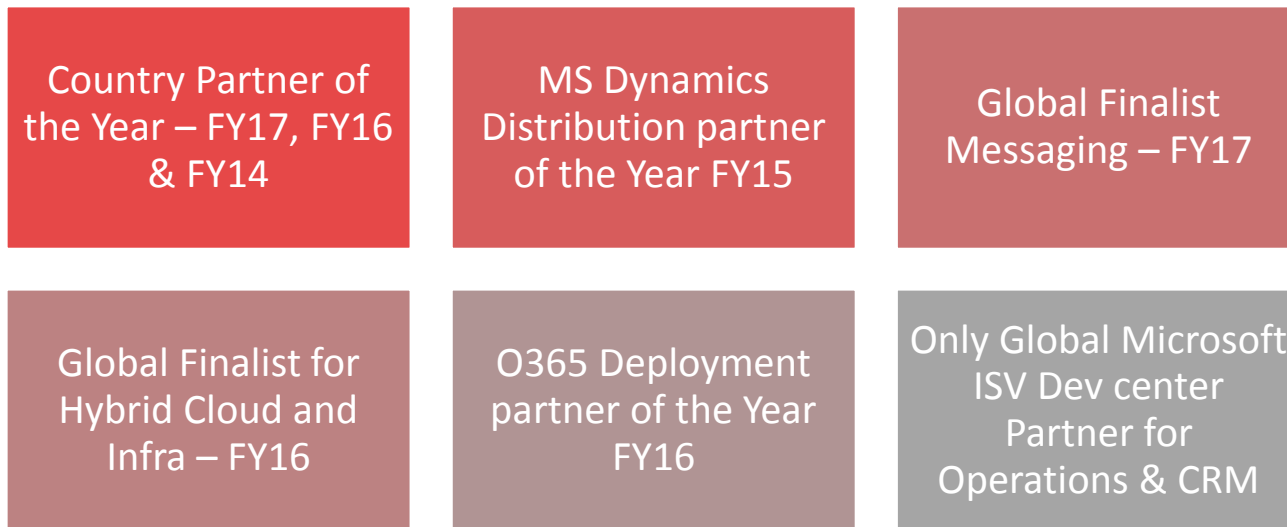BRICK CLICK™ RETAIL PLATFORM

rezopia FROM SONATA SOFTWARE

halosys

Advanced Supply Chain Software™ for Microsoft Dynamics™ AX

RETINA discerning insights

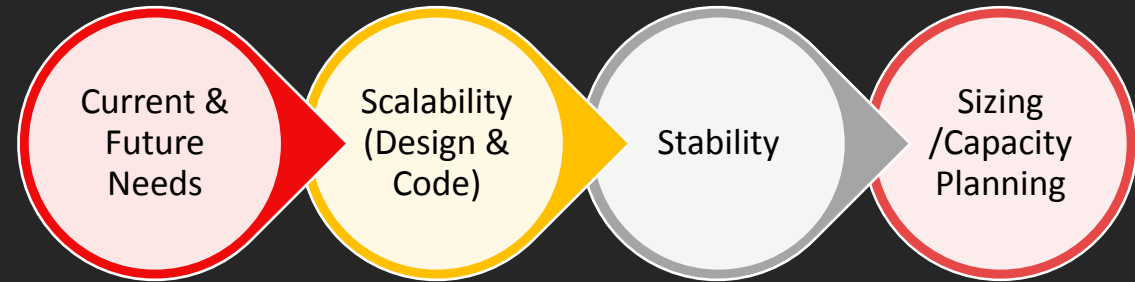# Sonata & Microsoft PARTNERSHIP

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Unique Microsoft & Dynamics Partner aligned to the Digital Vision

25+ YEARS developing, supporting and delivering MS technologies. A Decade of Engineering Dynamics AX & CRM for MS

Sonata - ISV Development Center for Operations & CRM across the Globe

Country Partner of the Year – FY17, FY16 & FY14

MS Dynamics Distribution partner of the Year FY15

Global Finalist Messaging – FY17

Global Finalist for Hybrid Cloud and Infra – FY16

O365 Deployment partner of the Year FY16

Only Global Microsoft ISV Dev center Partner for Operations & CRM

Engage across PE, PDS, EAP

13 Gold Certifications

Compete Wins & Reference Customers

360^0 **PARTNERSHIP** 25+ YEARS

Gold Certified, Enterprise SI Partner, top LAR India

Global GTM & Delivery – Direct, with MS & MS Partners

Dedicated CoEs – AX, CRM, BI, SharePoint, O365, Azure, Devices

Top Goals for Performance Audit

Current & Future Needs → Scalability (Design & Code) → Stability → Sizing /Capacity Planning

- ✓ The symptoms of poor performance such as Response time, Throughput and Availability (Application not responding)

- ✓ Bottlenecks in performance

- ✓ Validate deployment architecture and configurations against the best practices for Dynamics AX

- ✓ Validation of development artifacts to comply with maintainability, performance and best practices

- ✓ Audit for scale and load to take business to the next level

- ✓ High utilization or pressure on resources across tiers – CPU, Memory, Disk I/O & Network

- ✓ Investment in the system pays back & running at its optimal levels

Typical Issues to analyze for

- **Workloads**
  - Change in workload and Other processes

- **AOS / Application Configurations**
  - Application & Kernel Versions
  - Configuration Keys
  - Debugging / Tracing
  - Table Caching
  - Number Sequences

- **SQL Server**
  - Configurations
    - File placements, Auto, Growth, RCSI, DB Statistics, TempDB, MAXDOP, Cluster Size
  - Expensive Queries
  - Blockings / Deadlocks
  - Missing / Un Used Indexes
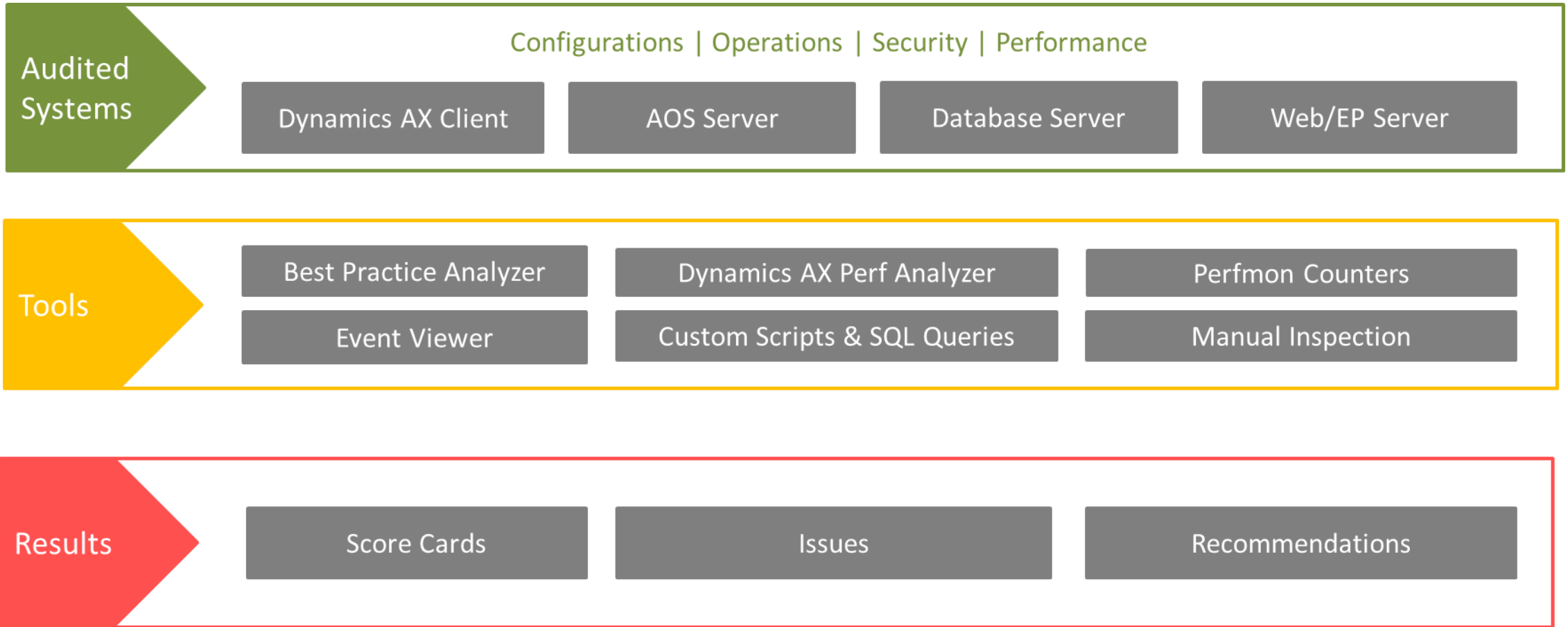
- **Application Code**
  - Server Side / Client Side code
  - Cache lookup settings
  - TTS Blocks
  - Nested Loops
  - Row based vs Set based
  - Multiple Selects

- **Hardware**
  - Sizing
  - Disk Settings / Layout
  - Security
  - Roles & Security Policies
  - Audit Logs

Typical Perf Audit Scope

Audited Systems

Configurations | Operations | Security | Performance

| Dynamics AX Client | AOS Server | Database Server | Web/EP Server |

Tools

| Best Practice Analyzer | Dynamics AX Perf Analyzer | Perfmon Counters |
| Event Viewer | Custom Scripts & SQL Queries | Manual Inspection |

Results

| Score Cards | Issues | Recommendations |

Sonata's Diagnostics Approach

Week 1	Week 2	Week 3, Week 4 & Week 5	Week 6
Application walkthrough/ Pain points	Discovery	Analysis Iterations	Findings & Presentation

Walkthrough

- Walkthrough of application landscape, Architecture and Deployment

- Walkthrough of high level business process in AX, AX POS & Surround applications

- Walkthrough of current pain points of Application

- Walkthrough of Future roadmap

Functional/ Technical analysis

- Analysis of technical architecture and deployment landscape + Integrations

- Analysis of Setups and Configuration

- Analysis for Customizations

- Deploy Scripts & Tools

- Analysis Iteration 1
    - Execute Test
    - Analyze test output
    - Collate & Validate findings

Functional/ Technical analysis

- Analysis Iteration 2 and 3
    - Execute Test
    - Analyze test output
    - Collate & Validate findings

- Collect Data Test & Prod

- Prepare Audit Report

Workshop

- Validate Sonata's understanding

- Present analysis findings

- Evaluation and Finalization of solution options and approach

Planning for Next Phase

- Approach
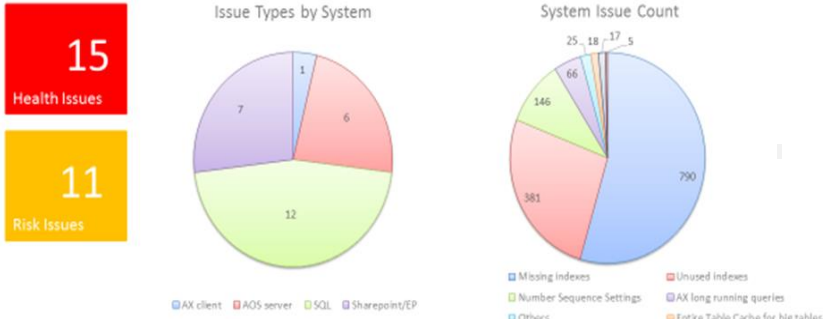
- Ball Park Estimation

- Plan

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☐ **Summary of Findings and Recommendations**
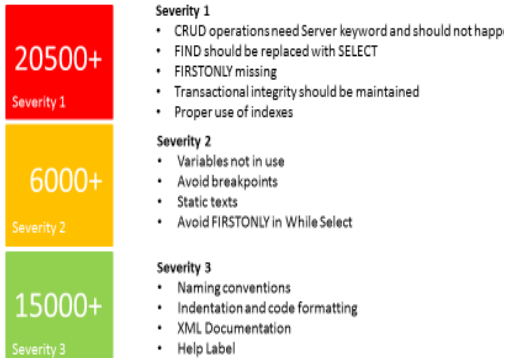
☐ **Detailed Reports**

☐ **Collated**

Data Points

Scorecards

The scorecards for the Microsoft Dynamics™ AX environment are provided below. These scorecards are a composite view based on the data collected and the answers given throughout the course of interviews and surveys to illustrate the possibility of encountering issues in a specific area. The scorecards show the state of the system with respect to health (current issues) and risk (potential for future issues).

Issue Severity Levels
Critical
High
Medium
Low
No Issues

AX System Health (Sample)

15 Health Issues
11 Risk Issues

Issue Types by System

System Issue Count

AX System Code Quality (Sample)

Severity 1
20500+
- CRUD operations need Server keyword and should not happen
- FIND should be replaced with SELECT
- FIRSTONLY missing
- Transactional integrity should be maintained
- Proper use of indexes

Severity 2
6000+
- Variables not in use
- Avoid breakpoints
- Static texts
- Avoid FIRSTONLY in While Select

Severity 3
15000+
- Naming conventions
- Indentation and code formatting
- XML Documentation
- Help Label

AX System Issues – By System Category (Sample)

Query performance

Issue 1: AX long running queries, Issue Type: Health, Issue Severity: Medium
- Number of tables found with high average time on individual queries and very high execution count for a small time window.
- Validate these and take necessary actions.

Issue 2: Blocking and Deadlocks, Issue Type: Health, Issue Severity: High
- Blocking activity is high. Several Deadlock reports were found.
- Recommendation is to further troubleshoot the specific deadlock. It could be possible to do a Performance Optimization Review Service.

Issue 3: Missing Indexes, Issue Type: Health, Issue Severity: High
- There are several queries that already have a missing index suggestion.
- Review missing indexes suggestions for most used tables.

Issue 4: Unused Indexes, Issue Type: Health, Issue Severity: High
- There are several unused Indexes found in the monitored time window.
- Unused indexes to be tracked in the long run and removed (if applicable).

Legend: Low | Medium | High

Issues & Recommendations	Issue Severity	Issue Type	Estimated Effort to fix
Application Configuration			
Application and Kernel Versions	High	Health	Medium
Entire Table Cache for big tables	High	Health	Medium
Batch Configuration	High	Risk	Low
Number Sequence Settings	Medium	Risk	Medium
AOS Server Configuration			
Processors core	Medium	Health	Medium
Power Management Settings	Medium	Risk	Low
X++ Code analysis			
Severity 1 X++ Best Practices check	High	Health	High
Severity 2 X++ Best Practices check	Medium	Health	High
Severity 3 X++ Best Practices check	Low	Health	High
SQL Server/Database Configuration			
SQL Version	High	Health	Low
Server authentication	Medium	Risk	Low
Additional databases on server	Low	Health	Low
Security			
Access to AX Production databases	High	Risk	Low

Sonata's Track record with Microsoft on Performance

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- **A Large Software Engineering Practice**
  - Robust Engineering Processes
  - Multiple upstream and downstream integration with legacy systems
  - Performance Driven Development, Designed and Architected for Scale
- **Performance Testing Partner for Microsoft**
  - 12+ years Engagement with Microsoft
  - Across multiple releases of Dynamics AX
  - Benchmarking, Performance Testing (Perf Runs, Trend Runs, Stress Runs, etc)
  - Test Frameworks & Tools (Benchmark Toolkit)
  - Test scripts created by Sonata and run at MTC labs
- **Support Microsoft / MCS on key customer engagements**
- **Methodology**
  - Blue prints , LCS, Tools, Re-usable assets
  - **Multi Instance Strategy & Management**
    - Multi Country Rollouts
  - **Layering & Branching**
    - Co-Existence with multiple ISV/Partner solutions

Enterprise Customer Engagements

Marquee Engagements	Perf Scenarios / Scale
Europe's largest Auto Services Company	7000 Concurrent Users 389,000 Sales Lines / Hr 519,000 Sales Lines / Hr
Largest Duty Free Operator	350+ POS 100000+ SKU's 60000 Promotions Daily 50000 Sales Lines / Hr
Global Specialty Chemicals Company (Manufacturing)	300 Concurrent Users 5000+ Transaction Lines / Hr Across Purchase, Sales, Transfer Orders
Leading Global ISV	90+ Countries 100 Subsidiaries 120000 Users, 45000 users live
2nd Largest Retailer in the world	20+ Million Customers / Other Masters 40 Million Transaction Lines
Leading Electrical Engineering Products Company in AU/NZ	2 Legal Entities 360 Users 1TB+ Database Size