



AVISTO  
EASTERN EUROPE

## CASE STUDY

# SW Verification and Quality Assurance

79% test cycle time reduction

# Case Study: SW Verification and QA



## SW QA services

QA takes important part in the software development process in order to make sure that final product meets desired level of quality and to make sure that requested features are met.

### FUNTIONAL

- Unit testing
- Smoke testing
- Integration testing
- Regression testing
- User Acceptance testing

### NON -FUNCTIONAL

- Documentation testing
- Installation testing
- Performance testing
- Tools migration testing



## Comprehend the Client

Profound understanding of client's main pain points, problems and goals.



## Goal

Deliver quality product on time according to specific business and user requirements.



## Solution

Expand test methodologies, identify and develop improvements in test execution and reporting.



## Results

Highly automated SW/HW test environment and improved test management process

# Case Study: SW Verification and QA



## Comprehend Client

Profound understanding of client's main pain points, problems and goals.

# IoT Systems

Multinational company specialized in energy management

Our client is a multinational company, one of the leaders in the field of industrial automation.

**Client solutions combines hardware and software** in order to make real-time automation and control decisions at a local, operational level. Software solutions introduce innovative features for efficient machine development such as collaborative work with SVN client, new IoT standard libraries (MQTTs, HTTPs, JSON...) etc.

Its inventive and unique software solution for developing, configuring, and commissioning the entire machine in a single software environment addresses industries, data centers, smart homes and buildings.





# Case Study: SW Verification and QA



## Goal

Deliver quality product on time according to specific business and user requirements

## SW QA services

Expertise in software testing

Following an **Agile development process** with weekly release cycles and **highly frequent deployments**, main goal was to provide **efficient and stable environment with a high level of automation**.

Existing test management was based on test scenarios written in text files and results represented in Excel sheets.

**Introduction of new Test Management Tool was needed.**

Together with the client, two main goals were set:

**A. Ensure quality of the software** solutions with high number of automated regression tests and improved tests management, such as:

- Increase percentage of fully automated tests;
- Increase test coverage;
- Improve procedures of test management.

**B. Improve software** to be more efficient, user-friendly and overall business ready.

---

# Case Study: SW Verification and QA



## Solution

Identify and develop improvements in test execution and reporting

## Tasks & Responsibilities

Hardware / Automation

Custom hardware test systems are designed ensuring that equipment is mechanically and electrically safe:

- All hardware devices are stored in **custom in-house designed HW test racks**
- Wiring and commissioning of new industrial equipment as it arrives
- Working on **one big project with automatic reconfiguration** using one PLC as a main control device and relays to switch off devices

**Tools & HW:** EPLAN, PLCs, Servo Controllers, Servo Drives, Servo Motors...



# Case Study: SW Verification and QA



## Solution

Identify and develop improvements in test execution and reporting

## Tasks & Responsibilities

Test Automation / Execution

Constantly improving automation test framework:

- Refactoring and maintaining existing automated **C# scripting files** to gain better test performance
- Adding automated **Python tests** for python programming interface to reduce execution time of time-consuming UI tests
- Migrating test framework from **Test Complete 12 to Test Complete 14** with additional automation options and better performance
- Introducing Test Complete **Web module** to cover Web based application parts

**Tools & Languages:** TestComplete (Desktop and Web module), C#, Python 3.X, Batch scripts, PowerShell

# Case Study: SW Verification and QA



## Solution

Identify and develop improvements in test execution and reporting

## Tasks & Responsibilities

Test framework maintenance / Execution / Reporting

Daily work on new and existing tests:

- Defining **new test specifications** covering low to complex system or integration functionalities
- Executing automated and manual tests covering functionality and diagnostic requirements – test started manually using Test Complete or automatically via **Jenkins**
- Debugging test failures and analyze root causes within complex software components
- Triage, report and track issues in a timely manner

**Tools & Languages:** IEC\_61131-3 PLC programming languages, SVN, Jenkins, JIRA, VMWare



# Case Study: SW Verification and QA



## Solution

Identify and develop improvements in test execution and reporting

## Tasks & Responsibilities

Reporting

**Xray for JIRA test management tool** was investigated, tested and presented to the client by Avisto team. After positive feedback, tool was accepted, and it is currently used by **all client's verification and validation teams**.

Dedicated Jenkins jobs were set for **successful Continues Integration** by allowing users to populate test results from Test Complete to JIRA XRay automatically.

Tool provided significant improvements in all test case management process parts, but especially in **test results reporting visualization and analysis**. Integration of Xporter, tool for automatic reports creation and distribution is planed for the future.

**Tools:** Jenkins, Xray for JIRA, Xporter



# Case Study: SW Verification and QA



## Results

Highly automated SW/HW test environment and improved test management process

**>79%time reduction**  
**of test cycle**

Preview of the results achieved after two and a half years of successful collaboration, which has been continued and expanded on new projects.

- More then 300 completed test cycles
- Maintenance **over 8000** tests per test cycle
- **84% All fully automated tests** (starting point was 41%)
- Test cycle reduced from 15 to ~ 3 days
- Continually building knowledge and proficiency in testing methodologies



# Case Study: SW Verification and QA



## Results

Highly automated SW/HW test environment and improved test management process

**63% increase**  
of test coverage

**Test coverage is significantly increased. More than 3000 new tests.** Major improvement of test results and issues analysis with **Xray Gadgets** enabled:

- us to discard previous solution based on Excel files consisted of over 1000 entries;
- identification of bottlenecks;
- flaws in software design and
- contributed to further development of testing strategy.

## User-friendly and self-explanatory software.

After close investigation of reported problems by both, internal and external users, we have recommended **over 30 solutions which have been completely implemented**. Our team works closely with developers to ensure product quality is continually improved during the project.

# LET'S CONNECT!

**Milos Milutinovic**

Regional Director

@AVISTO Eastern Europe

[milos.milutinovic@avisto-eastern.com](mailto:milos.milutinovic@avisto-eastern.com)



*Where passion  
leads to excellence*

# ABOUT US

## AVISTO Eastern Europe

AVISTO Eastern Europe is a service provider that focuses on empowering Industrial automation and Semiconductor projects by offering tailored made solutions in areas of Embedded Systems, Test Automation, Application Software and DevOps.

Established in 2007, AVISTO currently operates three design centers in Serbia and boasts a strong network of experienced engineers empowered by high level of technical adaptability to meet the specific requirements and demands of clients' projects.

As a French company and a member of the Advans Group, which comprises over 1000 engineers, AVISTO can deliver comprehensive product-based development support to clients at the enterprise level.

# THANK YOU

