



Java-Based HMI/SCADA

Is It Worth the Risk?



Introduction

Java has allowed some HMI/SCADA providers to offer an OS-independent product. However, Java-based HMI/SCADA systems do come with disadvantages.

Some of the disadvantages include:

- Being subject to both major and minor changes from Oracle, which owns the Java intellectual property through the acquisition of Sun Microsystems
- Having to deploy more frequent updates in order to stay current
- Managing performance issues
- Dealing with the resulting higher risk to plant operations
- Maintaining more IT resources, including for development and database administration

Availability and Reliability: The Highest Priorities for HMI/SCADA

Regardless of where it's deployed, a HMI/SCADA system must provide availability and reliability. Plant operations and production suffer when failures in the HMI/SCADA occur – and can even lead to life-safety issues.

Every automation project involves meeting three main challenges:

- Availability and Reliability
- Risk
- Cost

Automation teams must answer: how to reduce cost without compromising availability? How to mitigate risks while keeping costs under control?



As one example, technology such as redundant solutions improve availability. Unlike some Java-based HMI/SCADA, superior, easy-to-install redundant solutions are available in proven HMI/SCADA technologies such as iFIX and CIMPLICITY from GE Digital.

Costs of Higher Risk

Higher risk associated with downtime or failures – whether a machine, line, plant-wide system, or enterprise-wide HMI/SCADA system – is an important factor to consider.

Choosing a proven HMI/SCADA helps to reduce risk and decrease the possibilities of:

- Production losses
- Loss of data
- Quality issues
- Missing customer commitments
- Damage to the company brand
- Equipment damage
- Operator injuries



Upfront Cost vs. Total Cost

Some suppliers of Java-based HMI/SCADA software have offered unlimited tags, clients, and connections, which gives an impression of lower cost. In that context, here are a few points:

- Unlimited tags, clients, and connections are only valuable if you can trust a HMI/SCADA package to scale.
- The cost escalates with the addition of features that are usually included in traditional HMI/SCADA packages.
- Most HMI/SCADA systems are small and don't benefit from unlimited pricing.
- Total costs rise significantly when considering hidden costs.

Other Hidden Costs

While the idea of unlimited tags, clients, and connections has initial appeal, there can be many hidden costs to consider for a complete view of Total Cost of Ownership.

Other hidden costs that might become apparent include:

- HMI/SCADA users may have to buy additional modules from a Java-based HMI/SCADA supplier to secure the features that they need.



- Companies might need a DBA to run the system in the case of a HMI/SCADA package that depends on SQL Server.
- Configuration can take longer and require IT support.
- Debugging might be a much more time-consuming process compared to traditional HMI/SCADA systems that have evolved for superior ease of use over decades of development.
- Online support forums might not welcome new users with simple questions or questions that have already been answered in the past, leading to higher costs related to development, troubleshooting, and maintenance.

According to some users, the Java-based HMI/SCADA systems may require more configuration compared to proven, out-of-the-box HMI/SCADA packages.

Also, according to a user, many Systems Integrators feel they have to hire “nerds or rocket scientists to engineer projects” with Java-based HMI/SCADAs.

Commenting on online support, the user continued:

“Many developers, especially beginners, are afraid to discuss and ask questions in [the online] forum because they feel that they will be mercilessly hounded by intellectuals.”



When hidden costs are considered, Total Cost of Ownership can be truly compared. This comparison often demonstrates the savings available with proven HMI/SCADA technology that has a shorter time to solution, significantly less time needed to fix systems, and less risk.

Java-Based HMI/SCADA: You Be the Judge

Research shows that Java-based HMI/SCADA systems can present challenges.

Here are some publicly available, direct quotes from users of Java-based HMI/SCADA software.

Names of companies, products, components, and version numbers have been removed and replaced with [HMI/SCADA], [Version X.X], [component], etc. For detailed source information, please contact GE Digital at gedigital@ge.com.

“We run Java in a virtual PC but after a while the Java application seems to crash for no reason. Crashes happen at random times after no specific actions. We’ve tried freshly reinstalling Java and [HMI/SCADA] but this does not seem to help. We’re not sure if it’s Java or [HMI/SCADA] causing this problem.”

“If you want something that works out of the box, [HMI/SCADA] is not the best choice. There is a fair amount of configuration needed for it to perform well ...”

“I have [Version X.X HMI/SCADA] on a pretty basic application. I have experienced, only on a remote client view and also at [component] the application exit out randomly without any prompt. Attached is the whole Java log, that gets created right after each ‘crash.’ I have uninstalled completely Java, re-install and still same symptom.”

RESPONSE: “I have also experienced this. I have experienced this when running a client and a [component] on my workstation for both a client and a test [HMI/SCADA] system. No warning and no prompt.”

“We just had an [HMI/SCADA] server crashing in a plant. The clients lost connection, and when we looked at [component], the service appeared to be dead. Restarting the service caused the clients to reconnect, but after a few minutes, the service crashed again.”

“I am using [HMI/SCADA Version X.X.] Things were going fine till end of work yesterday/this morning. Now I can barely get a single change done and saved before [component] crashes. ... I don’t see any errors other than my instance just stops responding.”



Java-Based HMI/SCADA: You Be the Judge, Continued

"We are in contact with some [HMI/SCADA] developers and are desperately trying to fix this problem. This is a global problem therefore it won't be affecting just us. ... This problem has become a hazard and someone in our plant broke their finger yesterday because a RUD came down on his finger due to the condition of a bit sticking in the PLC after the HMI interacted with. It could become a lot worse than just a broken finger."

"Recently, my clients started freezing when left idle for approx. 5-10 minutes. ... There's no error showing it just freezes and the only action left is to terminate the client and start it again. I have a lot of scripting going on and it might be that something fails there, just can't figure out what."

UPDATE: "Okay, seems like it wasn't the [component] causing this. Still getting freezing clients. Also an old problem has started again, see link to one of my previous posts. It just starts randomly without any obvious reason."

"I recently upgraded to [HMI/SCADA Version X.X] since then I have not been able to launch clients or [component] from my PC. The day I upgraded the server my PC worked fine. ... There are 4 of us working on the server and 2 of us have this problem."

RESPONSE: "I have this same problem. Strangely enough, it was working yesterday."

"[Component] faulted out on me yesterday, refuses to re-start. Not having any luck finding a solution."

RESPONSE: "I've only got a crappy work around for you at the moment ..."

UPDATE: "Never did get a response from the Support portal. But restored an old backup and re-configured the database connection. It now appears the tag histories are not storing correctly."

"When I try to launch the [component] from [HMI/SCADA] all I get is the Java startup window with 'Java ... ,' even Java runtime console won't start."

RESPONSE: "This happened to me last week."

RESPONSE: "I'm having this same issue."

RESPONSE: "I had the same behavior only just on the client, the [component] worked fine. I could launch clients from other servers just not this one."

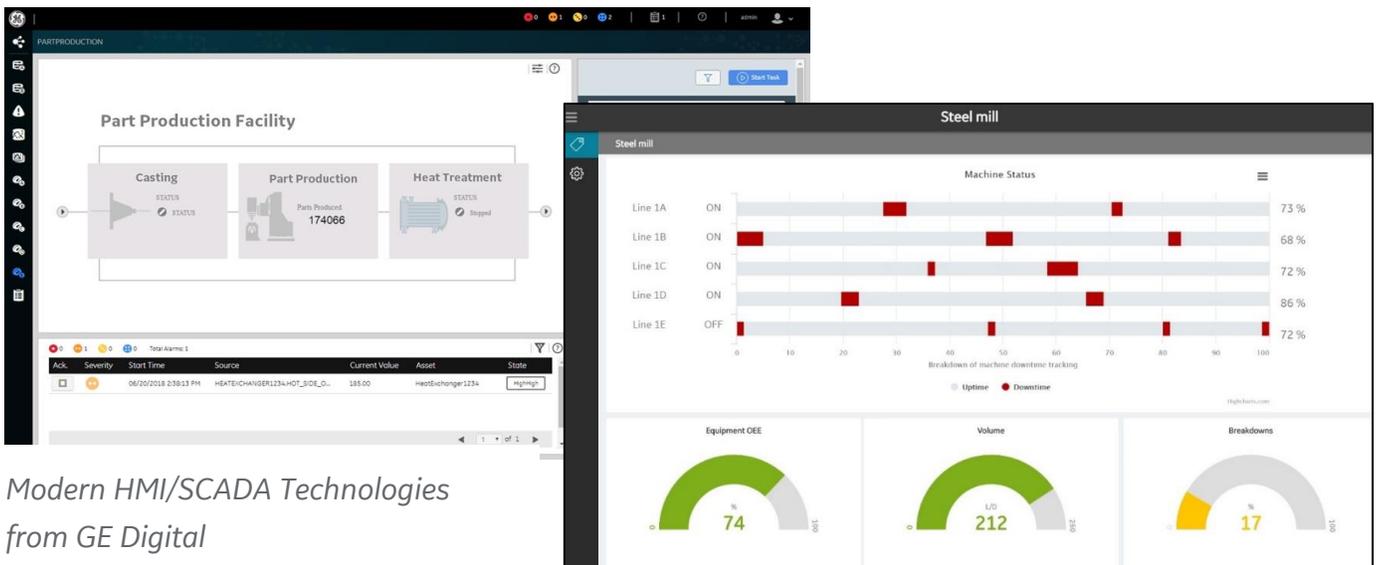
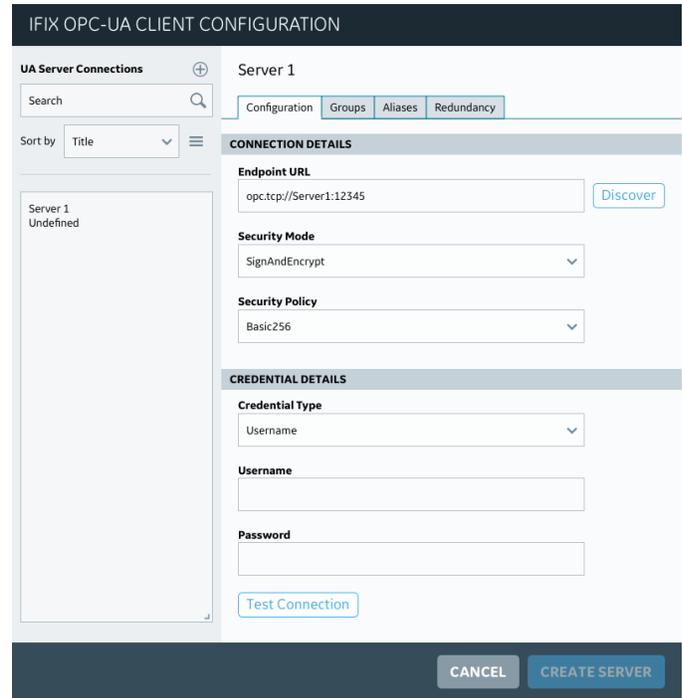


Balancing Availability, Risk and Cost

Every HMI/SCADA user can find the right balance between the three main challenges of availability and reliability, risk, and cost.

GE Digital helps you balance these challenges:

- Innovative technology based on 35+ years of success, trusted by nearly 20,000 customers around the globe
- Superior performance and speed
- Expert support, online documentation, user groups, and forums
- Price match program – you don't have to sacrifice quality for a lower price
- Extensive testing
- Automation software developed and used by GE, one of the world's largest manufacturers – we know what's important to today's companies and their digital transformation
- Ease of use – from modern configuration technologies to redundancy for higher availability



Modern HMI/SCADA Technologies from GE Digital

iFIX and CIMPLICITY from GE Digital: What Customers Are Saying

Here are examples of what GE Digital customers are saying. The names of individuals and companies are available upon request by emailing GE Digital at gedigital@ge.com.

“The beauty of the GE products, all of them, GE does a lot of work testing. Anything that causes a computer to have a glitch means downtime to me, and that’s not acceptable. Honestly, GE’s done a really good job of looking out for that and making sure we don’t have those issues.”

– Global Automotive Manufacturer

“We’ve been working with GE for many years, and it’s been a great relationship. Our philosophy is that you pick a good company up front to meet your needs, and you stick with them. We haven’t been disappointed.”

– City Water Dept., producing billions of gallons each year

“iFIX has done an excellent job over the years and continues to be one of the most solid and flexible SCADA platforms on the market.”

– Major International Airport

“Using GE Digital’s CIMPLICITY software has enabled us to demonstrably increase productivity and significantly improve the process quality. The software facilitates the daily work of our staff.”

– International Chemicals Manufacturer





Discover why GE Digital's iFIX and CIMPLICITY software are the reliable choices for HMI/SCADA users around the world.

Visit <https://www.ge.com/digital/applications/hmi-scada>

About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

Contact Information

gedigital@ge.com

www.ge.com/digital

©2019 General Electric. All rights reserved. *Trademark of General Electric. All other brands or names are property of their respective holders. Specifications are subject to change without notice. 11 2019