

# Analysis of the Method of Selection of a Software for a SCADA System

Ing. Alvaro Ruddy Miranda Torrez<sup>1</sup> Gan Xinji<sup>2</sup>

<sup>1,2</sup>Department of Mechanical Engineering

<sup>1,2</sup>Institute of Beihua University, Jilin Province, Jilin 132021, China

**Abstract**— When a SCADA system is carried out, the use of software that serves as an interface is essential, but due to the existence of a lot of software from different developers and each one with different characteristics, an analysis of the selection method of this software is important. For its selection, different criteria were taken into account such as compatibility, functionality, security and price. In the end it was determined that there is no software that is the best, but what is important is the analysis of the process to see which software is the best for a process.

**Key words:** SCADA System

## I. INTRODUCTION

When factories with large processes are concerned, thinking about all the variables that may exist is inevitable and besides thinking about the control and automation of this process, SCADA systems are one of the best existing solutions. But the larger is this the process will also be complicated, this translates into many aspects on which decisions must be made, and one of these aspects is the software that should be used.

The software that in turn serves as interface is an important decision but since there is a large amount to choose from and each software with different characteristics, this decision becomes more complicated, then an analysis must be carried out in order to make the choice of software suitable.



Fig. 1: Panel De Control Que Sirve De Interfaz

## II. HMI & SCADA

HMI and SCADA are two much related terms since an HMI is part of the components of a SCADA system.

HMI is the man-machine interface, it is a control panel that is designed to achieve an interactive communication between the operator of a process and the process, with the function of being able to see the results, the data of the time in real time and even the power of the operator's transmissions to the process.

A SCADA System is a System of Supervision, Control and Acquisition of Data that involves direct control or communicate with one or more of the following elements:

- Industrial automation networks and machines
- Telemetry and remote control using continuous communications or burst
- Process Control Systems and Statistical Process Control
- Data Acquisition Systems (DAQ s)
- Historical and Data Storage Servers
- Industrial Control Systems using PLCs and RTUs.
- Business environment systems, such as ERP and MES systems.
- Industrial Cloud Computing Environment
- Security Systems and Processes
- Local machine security
- Security and process control
- Business or global connectivity involving LDAP and others.

This SCADA / HMI software is used in all types of industries to provide a direct means of machine control, automation, security, storage and data analysis, communications, and allow connectivity to a variety of functions within the system.

The HMI and SCADA systems are linked to PLCs, CNCs and other control systems through industrial field buses (MPI, Sysmac Way, Modbus, etc.).

In summary, the HMI software is used to monitor SCADA systems.

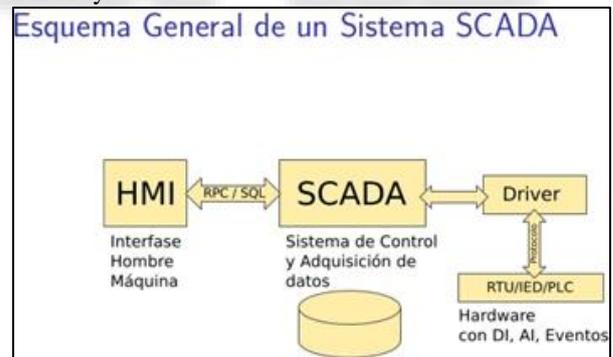


Fig. 2: HMI/SCADA Relation

## III. SOFTWARE FOR AN SCADA SYSTEM

One of the many components of a SCADA system is the HMI / SCADA software, but it should be clear that not all software for SCADA is HMI software.

First, we must remember that there is a difference between SCADA and HMI, so the HMI as it is said is the human machine interface (which of course also needs hardware). Although the SCADA and HMI software is not the same as SCADA, it is the general control system (which also includes hardware) and the HMI software is what the operator is working with.

SCADA software needs an integration stage and better control, but several vendors sell only HMI software,

some with HTML5 editions, or a software for process histories, or report software, or alarm software, or development software and all kinds of applications. of clients in the field of SCADA.



Fig. 3: Asphalt Plant Using A SCADA System

Each vendor has a different approach. Several providers offer HMI / SCADA packages that could include HMI software or tools to build and configure, alarm management, data collection and analysis in real time, various forms of data integration, plant historian, fault detection, among others.

Below is a list of HMI and SCADA software in addition to other software and vendor solutions.

- ABB MicroSCADA Pro
- Aggregate SCADA / HMI - Industrial Automation and Process Control
- AzeoTech DAQFactory HMI / SCADA Software
- CIMPLICITY HMI & SCADA Software | GE Digital
- Cogent DataHub ® | Secure in-plant, cloud and remote access to real-time data
- That Automation Scada Crew Software
- GE Digital HMI, SCADA & Industrial Automation Software
- GENESIS64 HMI / SCADA Software - OPC, PLCs, BACnet Certified
- HMI / SCADA Software zenon by COPA-DATA
- HMI / SCADA System zenon Operator - Embedded HMI System
- iFIX | HMI, SCADA & Industrial Automation System | GE Digital
- Ignition HMI by Inductive Automation
- Ignition SCADA by Inductive Automation
- iX HMI Software - Beijer Electronics
- Laboratory Virtual Instrument Engineering Workbench | National Instruments
- Mitsubishi Electric Human-Machine Interfaces (HMIs) and HMI software
- Open Automation OAS Software
- Rockwell Software Human Machine Interface - HMI Software
- SCADA Supervision System & Software | Progea
- Schneider Electric Vijeo XL SCADA Software
- Siemens HMI software: One-stop visualization software
- TeslaSCADA HMI / SCADA
- Vijeo Designer HMI software Schneider Electric
- Visibility in production: SIMATIC WinCC V7 SCADA system

- VTScada by Trihedral - VTScada Instantly Intuitive SCADA HMI Software
- Wonderware HMI SCADA Software Solutions

#### IV. SELECTION OF A SOFTWARE FOR AN SCADA SYSTEM

After seeing all the variety of existing software and knowing that all have many similar and different characteristics, a question and a problem are presented. What is the best software to use in a SCADA system?

The answer is not one, there is not a single program that is the best for everyone. An analysis of the software should be done, but more importantly, an analysis of the process and the project itself.

To help with this analysis there are some aspects that should be taken into account and explained below.

##### A. Compatible

The software should be compatible and capable of operating with all systems, for example, Cross-platform: Windows, mac OS, Linux.



Fig. 4: Operating Systems

In addition, the software must also be compatible with the existing hardware in the process to be controlled or in the case that the hardware does not yet exist, this software should be able to interact with as many devices as possible and which the project requires.

##### B. Functional

Something very important is that the software must be able to work now and in the future. It should be possible to modify the schedule if the process is larger in the future, or if there is a change. Possibly they can increase or decrease the existing inputs and outputs, so the software should allow you to make any changes.

##### C. Security



Fig. 5: Informatics Security

Security is an extremely important point. It can produce access to process intruders, external or internal intruders, so this should be avoided.

The software must be able to allow you to have the level of encryption that the process requires or the programmer wishes, in this way be calm before the arrival of a hacker.



Fig. 6: Money

#### D. Price

It is another very important point. Every project always seeks to reduce costs, so looking for software with an adequate price is necessary. There are some that after buying them offer special features that can be added, and are not free.

But this don't means that the most expensive software is the worst or that the cheapest software is the best or vice versa. It is not necessary to buy the most expensive software with the excuse that the most expensive comes with everything. As pointed out above, everything depends on the process and the project. Possibly there are projects that with the most basic and cheap existing software have everything necessary.

#### V. CONCLUSION

After having seen a lot of SCADA software and performing an analysis of the method of selecting a software for a SCADA system, you can see that the most important thing is first the analysis of the process that you want to control and then the selection of the software following some aspects as compatibility, functionality, security and price.

Also make sure to choose a software for a SCADA system that has a large graphic library and has a programming language with which you are familiar.

#### REFERENCES

- [1] SANCHES Acedo José, "Control Avanzado de Procesos", Editorial Díaz de Santos.
- [2] FORD Merilee, "Tecnología de Interconectividad de Redes", Editorial Prentice may.
- [3] ESCALERA S.J.(2002) "Tecnicas de I&D en Ciencias y Tecnología", Academia Nacional de Ciencias de Bolivia, New York Academy of Sciences, Cochabamba, Bolivia.
- [4] [http://www.sivalles.es/index\\_esp\\_archivos/hmi\\_esp.htm](http://www.sivalles.es/index_esp_archivos/hmi_esp.htm)
- [5] <http://www.indusoft.com/blog/2013/05/31/cual-es-la-diferencia-entre-scada-y-hmi/>
- [6] <http://s2e.es/diferencia-entre-scada-y-hmi/>

- [7] <https://www.automationworld.com/article/7-tips-make-right-scada-choice>
- [8] <http://www.indusoft.com/blog/2010/08/06/how-to-choose-your-scada-system>