



Case Study - Prison Automation

Company

RENIFER Systems and Automation

Industry

Building Automation

Location

Brazil

Challenge

In 2011, RENIFER was commissioned by the Brazilian government to develop a prison monitoring system. It would take longer for current legacy software products to be enhanced in order to fully leverage the new technologies than it would a modern product already built on today's current technologies.

Solution

FactoryStudio from Tatsoft meets the large distributed systems requirements, which the legacy system would not support. Key technological consideration - a software package to support multi-threaded task execution.

Results

They were able to create a safer environment, reduce the number of illegal objects entering and a tighter grip on the controls used to open and close doors, and manage unauthorized activity through those doors.

We find that FactoryStudio is built to face the challenges of prison and public safety applications today, and are confident Tatsoft will be able to resolve any unknown challenges we come across

- Antonio Jacomini, owner of Renifer Systems

RENIFER Systems and Automation provides, along with automation services, product design, detailing, fabrication, erection and maintenance of gates, fences and steel structures for construction, remodeling and maintenance to meet the needs of their customers.

In 2011, RENIFER was commissioned by the Brazilian government to develop a prison monitoring system to be used at the first private prison with public participation, located in Itaquitinga, with a capacity to house 3200 prisoners and control 816 automated doors and cells.



Over the next twenty five years, Renifer will be managing many prison locations for the government, after which they will turn control of those facilities back to the government. One of their most important considerations was the longevity of the automation software they choose.

As the world is currently going through a major evolution in hardware and software platforms, it will take longer for current legacy software products to fully leverage the new technologies than it would a modern product built on today's current technologies.

Renifer had been using its proprietary software (built in Visual Basic) in many Brazilian prisons for automation controls. They decided to use FactoryStudio for this new project because it meets the large distributed systems requirements, which the legacy system would not, or would take too long to update.

A key technological consideration was in selecting a software package suitable to the requirements, where for performance reasons, it must support multi-threaded task execution, modern scripting languages like VB.NET and C#, redundancy at the project server level, WPF graphic development tools, remote access, flexibility to develop communication protocol drivers for proprietary protocols, and Web Service interfaces.

The prison cell access and control application needed to be designed to avoid opportunities for prisoner contact with jailers, thus providing a safer more secure work environment.

The Prison Management System, which manages the prisoners' schedule (for visits, lawyer IDs (fingerprint), date/time for activities), securely sends commands to FactoryStudio through its' Web Services interface to manage controls which open and close cell doors and other secured areas of the prison.

Renifer Electrical Engineer Décio Kunitake worked with Tatsoft Engineering Services team to complete the automation project.

Dynamic graphical prison system displays were created in FactoryStudio's WPF engineering environment. Real-time cell status and warnings are displayed on 190+ computers around the facility.

Special hardware developed by Renifer included electronic circuits using Micro-controllers with a proprietary protocol for security. These components control and monitor the states of doors for Alarming when they are opened without approval.

To help prison guards, cameras are used to provide visual verification within FactoryStudio, to coincide with the feedback from the controls, of when doors are being opened and that people passing through them are validated.



"One of the main reasons we decided to work with Tatsoft is they have decades of experience in developing software products and understand the need to have a flexible, reliable platform on which to build applications that will last a long time"

- Antonio Jacomini, owner of Renifer Systems

Creating a system managing over 800 prison doors is quite an effort. Over the course of two months, FactoryStudio proved to have the tools needed to greatly reduce the development time. This type of boiler-plate application requires a standard set of data for hundreds of cell and area access doors. Using such FactoryStudio features such as Reference Tags, which are used as aliases or place holders for actual tags provided by the operator in runtime, and Tag Templates, meant only one set of Tags needs to be configured in the displays, rather than hundreds of sets of Tags.

The same concept meant that only a minimum number of displays is required to manage the entire system, rather than hundreds. When developing the graphical displays, for example, FactoryStudio could show the status of datapoints for each cell by entering or selecting the cell number. FactoryStudio then replaces the reference Tags with the Tags based on the entered value. In this way, it is not necessary to draw displays for each of the cells individually.

Overall, the Renifer/FactoryStudio systems have helped reduce the number of illegal objects entering prisons, reduce corruption throughout, and improved reliability of cell door data, all resulting in a safer more productive environment.

