

UNDERSTANDING INTEGRATION OF SECURITY TECHNOLOGY

Introduction

This article is part of the "Understanding CCTV Series" which are abstracts from STAM InSight - The Award Winning CCTV Program on CD ROM. This CD ROM has many innovative CCTV tools for skill and productivity enhancement.

Integration of security technology is a world wide trend with many benefits and is used extensively while designing electronic security systems. This article will trace the history of this integration and we will also discuss the various technologies which are being used. The integration of security technology can be divided into the following two levels.

System integration - this involves the integration of the various sub systems of a security management system.

Site integration - this involves the use of communication technology to integrate the security systems at different sites for the same organisation or even different organisation. The types of monitoring stations being used will also be discussed

System integration

A typical electronic security system is usually made of the following sub systems:.

- Alarms and Alarm monitoring
- CCTV
- Access Control Systems
- Fence Detection System
- Intercom Systems

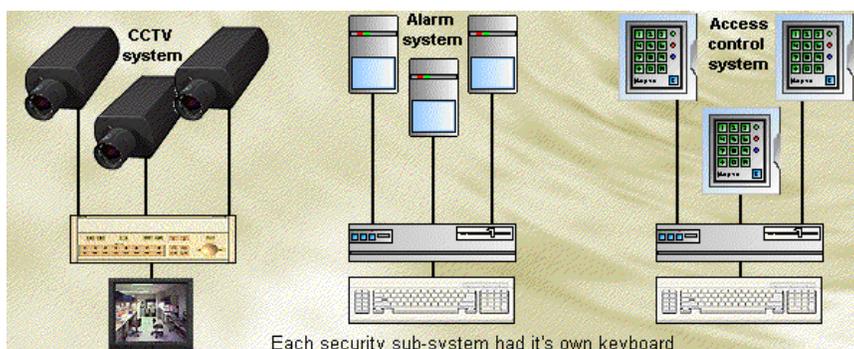
The role of alarms and fence detection systems is to detect movement. The Access Control system restricts / controls movement of people. The CCTV system provides 'eyes' to the security system. There is a definite trend towards the integration of these systems so that they support each other and provide a more effective system. It may be worthwhile to understand how and why this integration is taking place.

First generation

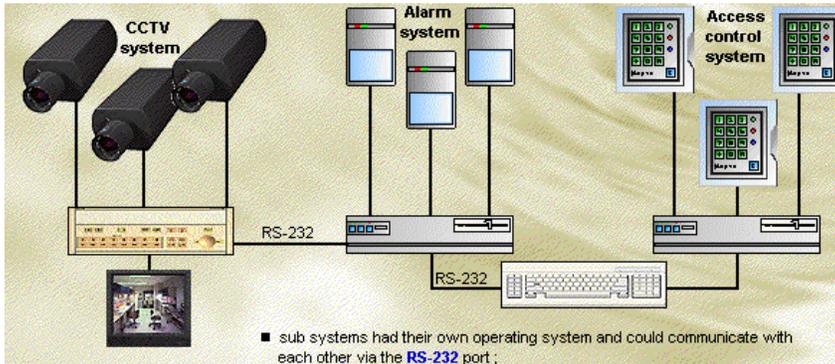
Electronic systems was still a new concept in the eighties.. All the above sub systems were being developed and installed in organisations. Initially the guard provided security to a site but with the introduction of electronic systems, the role of the guard underwent a change. He controlled the site using these security systems. In this generation the control room was a mess. Each system had its own independent control point and did not communicate with the other. The guard had a tough job keeping on top of each systems. This meant inefficiencies and ineffectiveness.

Second generation

To overcome this problem and make the system more effective, there was a trend towards integration. Some of the advantages of integration are:



- to make the best use of resources
- to enable the most effective management of the site and keep the control room uncluttered.
- make the electronics to most of the work
- to integrate systems, so that one system could respond to a particular activity on another system, electronically, consistently, and without the requirement for human intervention or judgement.

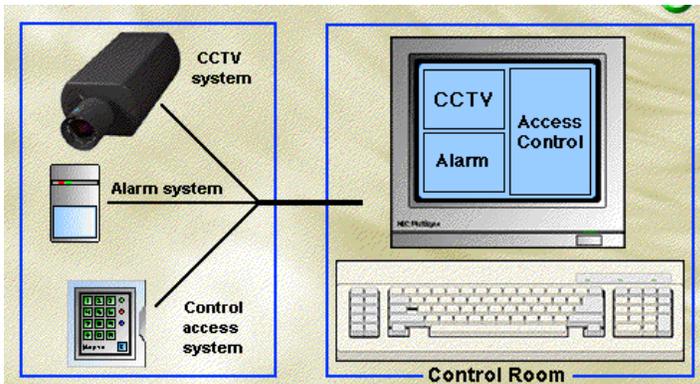


The major problem here was that each sub system was developed on different platforms by different manufacturers. The systems did not talk the same language. Stop gap solutions were found by writing communication software so that these systems communicate.

The next generation

The next generation integration is being done in multimedia mode. Here is a list of the different types of information sent by the different security systems

- | | |
|------------------------|-----------------|
| Alarms | Data |
| Access Control Systems | Data |
| CCTV | Video and Data |
| Intercom System | Video and Sound |



As we know, a multimedia system can handle data, video and sound by using the appropriate cards (i.e. video and sound card) in the computer. Once this information is received in a multimedia computer, the skills of a software engineer are needed to display the information in formats which will meet the requirements of the customer. Graphical User Interface (GUI) is one example which integrates these different media in a computer

Some of the advantages are:

1. The entire security system including CCTV can be controlled from a single keyboard. Upon an alarm, the floor layout can pinpoint the exact location of the alarm by flashing lights and the image from the local camera can be displayed in a window on the same computer screen
2. The use of Graphical Display (GUI) and mouse (point and click) makes the system operation very user friendly.
3. The building management system, fire and alarm systems can be controlled from the same terminal.
4. By using standard networking techniques, like LAN, WAN or intranet, the security system can be controlled by any terminal in the network.

Site integration

In a local site, the cameras, alarms, readers etc. are easy to cable and standard cabling styles can be used: co-axial cable for CCTV and twisted pair cable for alarms and access control systems.

If the site is remote (in the same town, same state or same country) or for a multi site organisation the communication link then plays a very important role. Therefore site integration is dependent upon communication technology. As expected many changes are taking place in this area also on a continuous basis. Here we discuss some of the changes:

Integrated services digital network (ISDN)

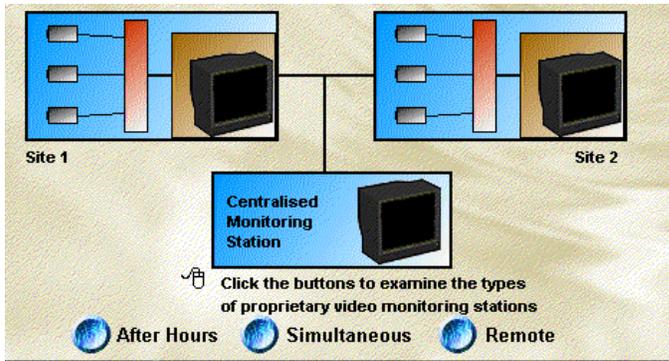
As the name implies ISDN is a digital network using normal copper wires. The traditional network (PSTN) is an analogue network. In a PSTN network, using a modem the maximum speed of transmission is 56.6 Kb per sec. It may be adequate for data (used with alarms and access control) but is slow for video pictures. Using picture compression of say 20kb per frame, it is possible to send 2-3 frames per sec. Though this may be considered satisfactory, it is still not real time

In that respect the base ISDN link has a bandwidth of 128 Kb per sec and is much better. If we use a compressed video picture of say 20 Kb, it would be possible to send 6 frames per sec and if we use a compressed picture of 5 Kb it would be possible to send 24 frames per sec, which is real time. In spite of these speeds, ISDN technology never took off. The main reason was that it required special adaptors to be put at the site. The second reason was that the local telephone (both the site and control room) exchanges needed to be ISDN compatible. ISDN penetration at this level was limited, restricting its use.

Asymmetrical digital subscriber line (ADSL)

This is the next generation communication technology, which is being used in the internet and has applications in CCTV. In ADSL, using high speed modulation techniques it is possible to send 1500 kb per sec (compared to 128 kb per sec for ISDN) of information downstream from the site to control room and 640 kb per sec up stream from the control room to the site. This technology is now standard in many up market computers and I expect it to become more common in the coming years. With this technology it will be possible to send real time video pictures using standard copper wires.

Communication technologies and multimedia are going to change how organisations will set-up their control rooms. Multi-site organisations are using these trends to set-up a central monitoring station to achieve site integration. From this central station, a watch can be kept on all the sites which may be spread throughout the city, state or country.



Types of monitoring stations

The functions of centralised monitoring stations may vary from organisation to organisation, but can be classified under the following three categories:

1. After hours monitoring

During normal office hours each site monitors its own operation, but after normal hours it would pass control to the central monitoring station. The central station would access each site periodically by fast scan and view all cameras as a routine check.

This is like a guard's tour. An alarm situation from any site would be communicated to the control room and the operator then takes appropriate action.

Manpower saving and continuous monitoring are the obvious benefits of this system.

2. Simultaneous monitoring

Both the local site and the central monitoring station would function simultaneously. The central station could access any site by fast scan and operate the security system through its own networked keyboard. For fixed cameras, the camera could be operated by the two locations at the same time, while in the case of pan tilt cameras a priority system would need to be set up. In an alarm situation, both the local and remote systems would be activated by an interface and the operator of each system would handle the switching network independently and differently.

Despite the duplication of effort the benefit of risk reduction and joint action between local and central stations would produce a more effective action in combating security breaches. Such a system would be valuable for high security organisations.

3. Remote monitoring

For small sites it may not be economical to have local monitoring. In such cases it would be best to monitor the location from a central monitoring station. Manpower saving and security for small sites are the major advantages of such a strategy.

About the author

Jayant Kapatker is an international authority on CCTV and is the brain behind STAM InSight The Award Winning CCTV Program. This interactive multimedia contains over 14 hours of CCTV content. This series of articles have been based upon the subjects covered in the STAM CCTV – A complete review web based training course. For more information visit: www.stamweb.com or email: sales@stamweb.com