GORIA

Case Study

Smart Building Solutions

Table of Contents

Introduction

With the push for efficiency and digital transformation, building managers are looking to automated services and smart solutions to smooth out their operations. Yet with facilities of different shapes, sizes & technology levels, it's hard to find a one-size-fits-all solution.

As a provider of different smart building projects worldwide, Gorilla's has several edge AI solutions that demonstrate the various aspects of upgrading buildings large or small. The following case study is a collection of our various building solutions and how they can tackle the tough jobs of building management.

Overview

This case study will focus on five international projects and how they managed different building issues from the exterior to the interior:

Parking	Entry Solutions	Security Solutions
Shisui Premium Outlets (Japan)	Danone Office Building	Songshan Train Station (Taiwan)

Elevator Solutions	Cyber Solutions
Macnica Smart Elevator (Japan)	New Taipei City Government (Taiwan)

Building Challenges

Managing all the components of a large building can be overwhelming. With a patchwork of old systems, equipment falling into disrepair and large staffing requirements, problems and costs can pile up quickly. Depending on the age of the building, each aspect brings its own host of problems:

Parking	Depending on the facility, parking can be a lot to manage: gated access, 24-hour surveillance, payment booths, unwanted intrusions and then some. Not to mention that parking lots are more likely settings for crimes.1
Entry	Gaining access to a building is a major security challenge. Most enterprise buildings need to ensure the right people get in during specific time periods. Multiple entry points increase staffing and equipment costs.
Security	Monitoring a large area with manual surveillance is inefficient and ineffective. Most buildings rely on 24-hour security guards and outdated VMS equipment. As a result, when an incident occurs in another area, it might not be reported in time.
Elevator	Elevators are a huge component of buildings running smoothly. Programming, wait times, repair times – all these things need to go right for people to get to work and run smoothly.
Cyber	With buildings and public spaces becoming smarter and more connected, building managers are often neglecting cybersecurity concerns. Wide swathes of digital cameras, IoT devices, and emergency and power equipment can be hacked and cause major problems.2

With all these issues in mind, clients tasked Gorilla to help streamline their building processes and reduce costs. The resulting five projects sometimes overlapped features showing the capability smart building solutions have for customization.

---

[1] https://www.ojp.gov/pdffiles/cptedpkg.pdf

[2] https://arstechnica.com/information-technology/2019/08/microsoft-catches-russian-state-hackers-using-iot-devices-to-breach-networks/

Parking Solutions

The problem for Shisui Premium Outlets in Japan was traffic jams at different times in different areas. Management could not determine how many cars were using the lot daily, making a huge headache to design a VIP service for guests.

Gorilla designed a pilot project to count vehicles, perform license plate recognition on select vehicles, as well as determine vehicle idling locations in order to view traffic flow.

Project Goals

1. **Total Vehicles and Their Hotspots**
   Needed to count all incoming traffic and the top ten locations visited in the shopping complex.

2. **Idling Locations**
   Needed to figure out which locations where vehicles were staying too long

3. **License Plate Recognition**
   Need to capture license plates of moving vehicles.

Deployed System

Gorilla deployed a vehicle management system at the entrance and exit gates of the shopping complex. This consisted of IP cameras at two entry points and a video analytics server that was connected to the building's network. Gorilla put care into the placement of the cameras since capturing license plates of moving vehicles depends on the lighting andweather elements as well as the speed of the vehicle. Once the system

was trained with data to identify the prefecture's license plates, all the vehicles could be recorded smoothly.

Once the system was calibrated video analytics could be applied to the camera feeds to determine different data:

- **Vehicle Counting** – this functions collects data on all the in and out vehicles using the parking lot for the day
- **Dwell Time** – this function determines the amount of time a vehicle is parked in a designated zone
- **License Plate Recognition** – this function was deployed at the parking lot entrance to record the plates of moving vehicles

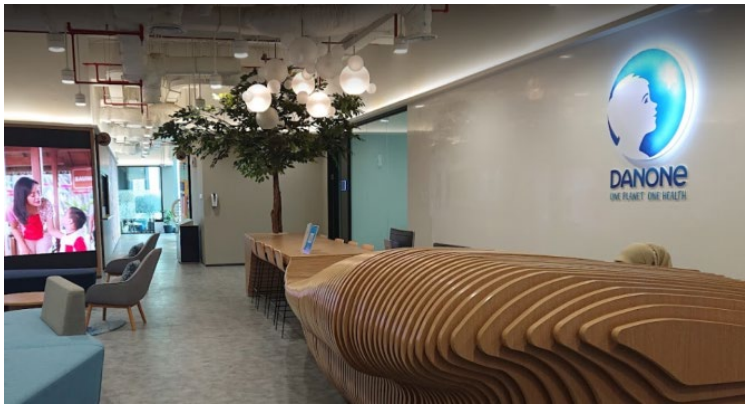
Results

During the test run of the system, Gorilla recorded a total of over 4000 vehicles at the entrance/exit with a total accuracy rate (recognition rate) of 95.89%. Hotspots were also recorded and these data recorded over the long-term will help ShiSui Premium Outlets design a comprehensive system for their parking needs.

IDENTIFICATION ACCURACY RATE OF 98.59%

Entry Solutions

Danone's office in Indonesia was returning to work after pandemic restrictions and needed an attendance system that could manage its staff, control room bookings and work around flexible work hours—all adhering to pandemic guidelines.



Gorilla provided Danone with a comprehensive system using video analytics, access control and RFID technology.

Project Goals

1. **Need flexible entry hours and desk allocation**

   Danone Indonesia opens their offices with a hybrid working model—needed to book workstations and allow access to staff for their flexible hours.

2. **Follow local pandemic guidelines**

   Mask-wearing and contactless devices were required to help with post-pandemic controls.

3. **Booking system for desks and meeting rooms**

   With rotating staff schedules, employees would need to reserve office workstations and meeting rooms.

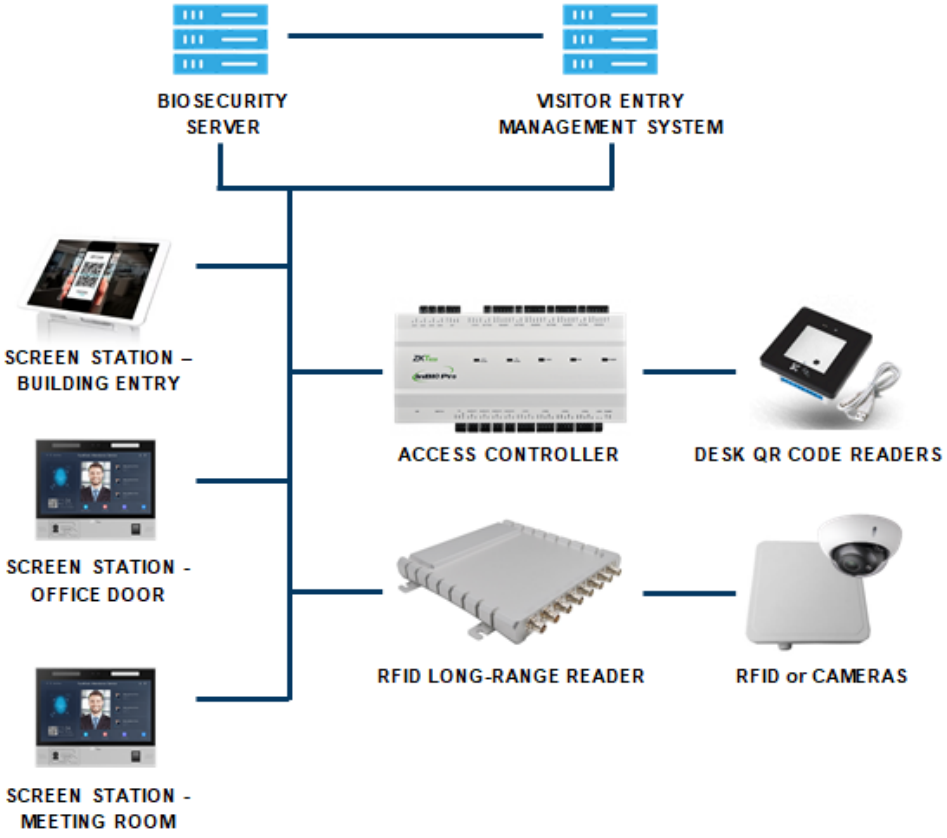
4. **Centrally managed with entry/exits records**

   Strict logs need to be kept of in/out times for employee hours that management can oversee

Deployed System

Gorilla's system consisted of the following:

- A **Biosecurity Server** - to log all employee bookings for workstations, meeting rooms and guest visits.
- A **Visitor Management System** to integrate with the building consoles to coordinate gate entry and elevator activation.
- An **Access Controller** & **RFID Readers** - connects the company database, the desk access mechanisms, the door locks entry, and recording logs.
- **Screen Stations** - for office entry and meeting room access



Facial recognition with temperature detection was placed at the entrance to verify employees' and visitors' identities and health conditions before granting access. With a QR-code authentication and facial registration, each individual's entry and exit records were logged for HR and management.

Results

The online desk and meeting booking system with an authentication mechanism reduced manual processing time by up to 70%, leading to a more independent and efficient work space.

70% REDUCTION IN MANUAL PROCESSING TIMES

Security Solutions

Taipei City Parking Management & Development Office needed Gorilla to upgrade its VMS in several Taipei parking facilities to lower response times and integrate with its current fire and warning systems.

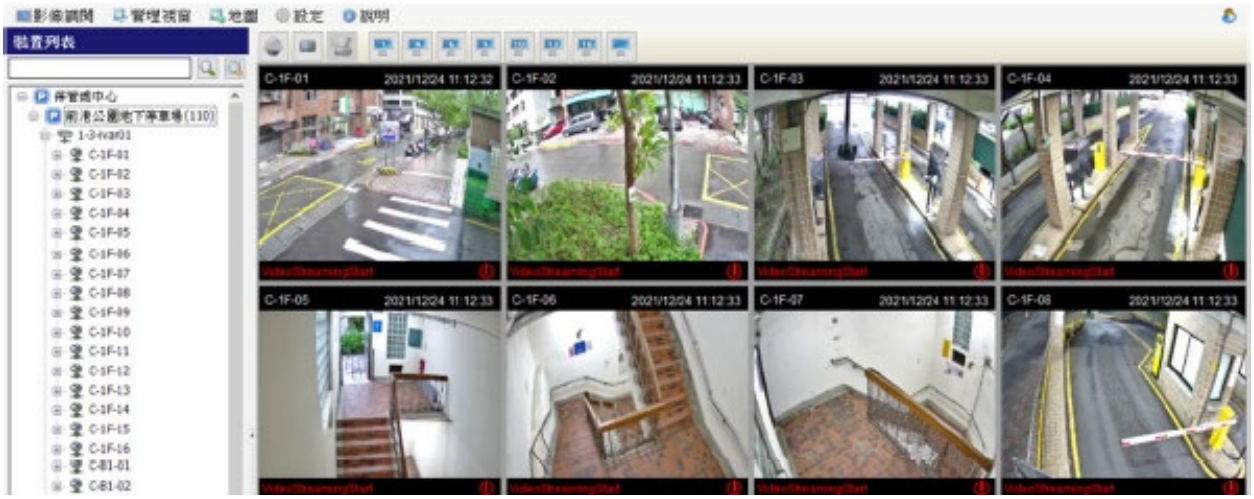
Songshan Train Station in Taipei is a major rail hub with a parking facility with hundreds of spaces for daily commuters. The manual security and emergency systems for such a large area were inefficient and ineffective. If an incident were to occur in another area, reporting time might not be enough to deal with the problem in time.

Project Goals

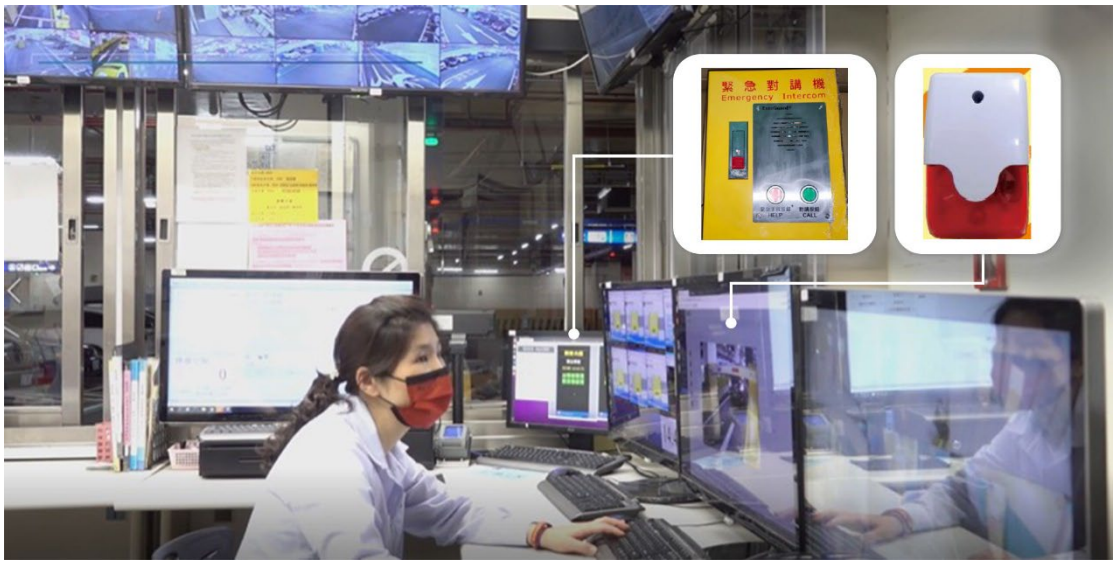
1. **Automate Services**
   The previous system relies on workers manually checking footage
2. **Integrate Various Alerting Systems**
   Several different alerting systems are used in many locations and must be connected
3. **Need to Keep Records of Incidents**
   Whenever an intrusion, parking alarm, or fire door is set off, administrators need searchable logs for future reference

Deployed System

The integrated system combines a digital map with floor plans allowing managers to access real-time footage from nearby cameras to monitor all corners of the Songshan parking lot. Managers can choose specific camera devices and customize video walls through a central monitoring platform.



Furthermore, the new solution integrates emergency response systems by connecting emergency buttons, intercom, and adjacent cameras, enabling staff to access emergency footage on a monitoring screen at the press of a button. In addition, all incident footage is saved and categorized which helps administrators easily find and manage past events.



RESULTS

Before the surveillance system was installed, Songshan was dependent on multiple staff members 24-7 and incidents would often take several minutes to be alerted. With the autonomous surveillance and emergency response system, managers can review a

holistic overview of emergencies and take immediate action in seconds to improve security and surveillance efficiency.

ALERT TIMES REDUCED TO SECONDS

Elevator Solutions

Gorilla paired with Japan tech giant Macnica to produce an AI-enabled Smart Elevator Solution. Developed using our AI appliance devices, the solution deploys capacity and fall detection to avoid overloading and increase safety.

Gorilla deployed a pilot project in Tokyo to put the solution to the test.

Project Goals

1. **Passenger Statistics Needed**

   Managers wanted to get an accurate count of people waiting for the elevator in the lobby along with any other statistical data that could be used for planning

2. **Elevator Usage Times**

   What are the busier times for usage along with the number of passengers?

3. **Tracking People Flow**

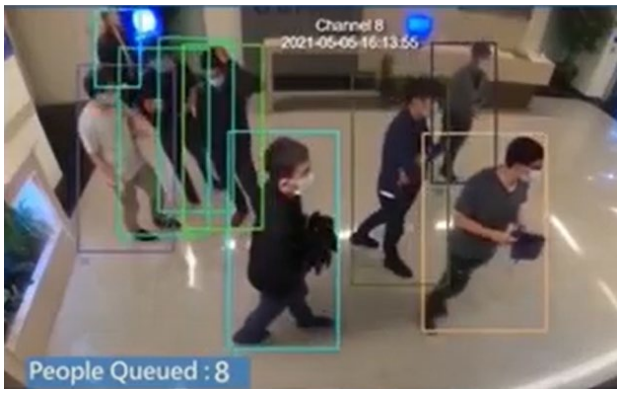
   Other appropriate building services could not be configured unless the number of visitors and their movements was successfully recorded

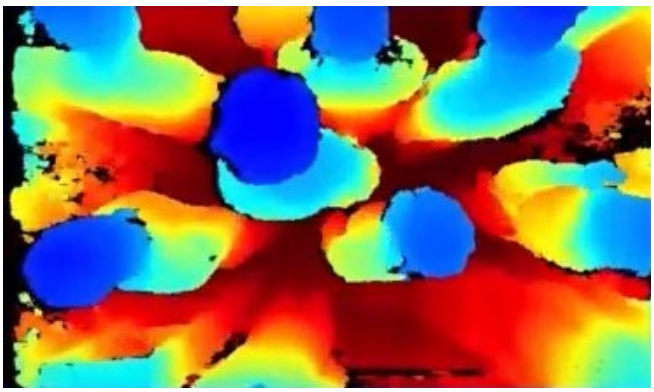
Deployed System

The designed system connected a Gorilla AI appliance to the elevator controller. The appliance performed AI computing on the video feeds of IP cameras inside and outside of the elevator. The resulting data is fed back into the main reporting module for monitoring and alert notifications.

The video analytics of the system could perform the following:

- **People Counting** – tabulates the number of people waiting for elevators on each floor
- **Daily Totals & Demographics** – calculates the building visitor entry/exit data and classifies them by age & gender. Data is logged to record people flow for future planning purposes
- **Intrusion Detections** – once integrated with the building management system, it detects intrusions into restricted areas
- **Fall Detection** – function using heat mapping to determine if someone falls while inside the elevator





Results

By using intelligent cameras at the elevators, the pilot project was able to collect valuable data. Such data gave insights into the daily people flow, preventing unwanted intrusions and overcrowding and even getting demographic analysis which will be used by building management to provide optimized services.

DAILY PEOPLE FLOW & TOTALS RECORDED

Cyber Solutions

Hackers and their tools are becoming increasingly sophisticated and in recent years this has led to an increase in cyberattacks on smaller institutions and their networks.[3]

Taipei City Government approached Gorilla to help them design a system to protect their network infrastructure. Any building with connected networks running IoT devices with a mobile workforce is increasingly vulnerable to malware or ransomware attacks. Governments are prime candidates for hacks so the need was even greater.

Project Goals

1. **Safeguard Internal Network**
   Needed to prevent internal network breaches which could cause severe impacts on government operational services
2. **24-hour Management**
   Administrators needed a solution that could report on incidents around-the-clock
3. **Cybersecurity Protocols**
   Needed to conform with government cybersecurity standards and follow national and global cyber intelligence

[3] https://krdo.com/news/2022/08/17/fremont-county-government-services-closed-due-to-a-cyber-security-breach/

Deployed System

Gorilla used our background in OT Security protection to establish a new Security Operation Center (SOC) for data collection and processing. The SOC utilized several toolsets to detect and thwart attacks:

- **24-7 Real-time Monitoring** – can detect any security incidents on the network environment in-house or remotely. The systems analyze all servers and local systems while generating reports and response mechanisms.
- **Updated Threat Intelligence** – uses machine learning to update cyber threat data from both domestic and global cybersecurity organizations, providing threat alerts and suggested defense measures.
- **National Cybersecurity Compliance** – conforms with the central government's Department of Cybersecurity regulations on data exchange standards and builds joint defense capabilities with the Government Security Operation Center (G-SOC). All data collected also conforms with the National Information Sharing and Analysis Center (N-ISAC) standards and can be used in forensic investigations.

Results

Gorilla's Security Operation Center provided numerous cybersecurity services, including network testing environments, monitoring services, security incident response, and cybersecurity threat alerts (county-wide). By implementing 24-7 real-time network threat monitoring, the response time for cybersecurity incidents was increased by a whopping 90%.

90% FASTER RESPONSE TIME TO INCIDENTS

Key Takeaways

Upgrading building management is not always a cut-and-paste job. But integrating with edge AI solutions does have some clear benefits that cut across all the projects we discussed:

Central Management

When integrating AI solutions there is a greater opportunity to connect disparate services and operate them centrally.

Automation

Automating services can decrease the cost and timeframe of typical manual processes or in-person staffing.

Decrease in Operational Costs

Using automated AI solutions alleviate staff hours and streamlines equipment with easier software upgrades.

Customizability

No two buildings are the same — and neither are their security and management issues. Tailored AI solutions can meet the physical & technical needs of the project.

Reporting

Each designed system can log and present data in sophisticated reporting modules, allowing for long-term planning and research.

Conclusions

Smart Buildings are an exciting development that offer streamlined services to heighten safety and security. Incorporating video analytics and cybersecurity technology has proven benefits for different companies and their unique environs.

While integrating smart solutions into existing facilities might seem daunting, there are a whole set of options that are available for buildings of any size.

Gorilla Technology

Follow Us

www.gorilla-technology.com