Case Study

Environment
Intel vPro® Platform

K-eco Introduces Intel® vPro® to Waste Disposal Facilities

The Korea Environment Corporation (K-eco) introduced kiosks equipped with Intel® vPro® to waste disposal facilities and built a system which integrates and controls waste disposal facilities in South Korea through remote management by digitizing the entire waste disposal process.

Korea Environment Corporation

At a glance

- In the process of handling waste data after reporting, there were many chronic problems such as errors caused by manual input by humans, as well as intentional omissions or over-reporting.
- Waste disposal is an essential issue that needs to be handled immediately in a highly developed industrial society like South Korea.
- Through the intelligent kiosk equipped with Intel® vPro®, real-time transmission from waste measurement to transmission is possible, establishing Korea Environment Corporation's intelligent waste safety treatment management system.

Executive Summary

K-eco manages two types of industrial waste: business waste and construction waste, both of which are dangerous and require transparent and careful management. If either waste is disposed and dumped without any control by K-eco, it may affect people's health and safety. The reporting of waste data has encountered troublesome problems, such as intentional omissions, over-reporting, and errors caused by manual input.

To solve these problems, K-eco introduced intelligent kiosks equipped with Intel® vPro® to waste disposal facilities around the country. An intelligent kiosk recognizes the weight of a waste truck as soon as it enters a facility and automatically transmits related data, such as the license plate to K-eco. The entire waste disposal process is digitized, making it possible to eliminate the chance that human interference causes data to be used differently. Through Intel® vPro®, a transparent and accurate waste disposal system has been established. In addition, it has shortened the recovery time from the errors and led to considerable maintenance cost savings by remotely controlling, recovering, and managing terminals at 8,000 waste disposal facilities nationwide. This integrated waste disposal management system will protect the environment and prevent tax leaks.

Challenges

1) How to digitize the entire process from waste measurement to data collection and transmission?

Growing environmental concerns have led to stricter construction waste management in Korea. In the article of the Enforcement Decree of the Construction Waste Recycling Promotion Act, there is a stipulation that the metering system of the interim waste disposal business "must automatically transmit and input the measured values into an electronic data processing program." However, as there was no established standard for "automated transmission," it has been customary for small waste disposal facilities to manually enter approximations into a PC and upload the data to the Internet before bringing in and measuring waste. As a result of human interference in the waste data reporting process, there were many cases where the data was processed differently than it should have. Therefore, it was necessary to introduce a simple but intelligent terminal that automatically measures, gathers, and reports data.

2) How can remote management of far-flung waste disposal facilities be done without causing system disruptions?

Most of the 8,000 waste disposal facilities nationwide are located outside the city, making management and supervision difficult. In particular, waste disposal facilities in remote areas are frequently damaged by natural disasters, such as lightning strikes, strong wind gusts, and typhoons. In addition, high-voltage lines and networks and are often cut off in these facilities. When a problem occurred in the system, it took two days to recover, even in cases where experts were dispatched to a remote facility. Thus, an innovative technology capable of remote control, recovery, and management was required.

3) How to apply cutting-edge technology to simple devices in a way that anyone, no matter their computer skills, can use them?

The interests of the government and disposal facility are intertwined in innovation. This is because the government oversees management, while the facility bears the burden of system construction. As many waste disposal facilities are small and the computer ability of public officials varies greatly, there was an urgent need for equipment that can be centrally controlled while simpler than a PC and free from management burden.

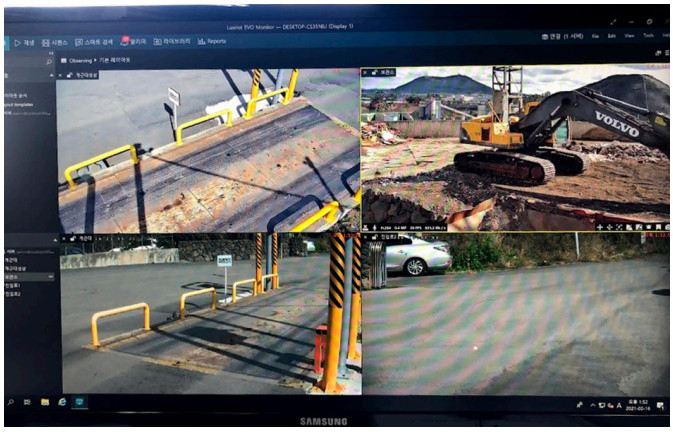
Solutions

1) Intelligent kiosk with Intel® vPro® enables real-time waste measurement and transmission.

Since PCs at waste disposal facilities are often used for other tasks besides data input and are not specialized, there was a problem with low stability. So, there was a need for terminals that were specifically designed for waste disposal processes, separate from tasks performed by office PCs. The intelligent kiosk equipped with Intel® vPro® was released, it automatically measures, collects, and transfers data.

When the waste truck enters a facility, the weight taken on the weighbridge is transmitted to the Intel® vPro® kiosk, the license plate is automatically scanned by the camera at the entrance. These data are sent together. Date and time, photo recognition and transmission are also done automatically in real-time. This enables transparent and accurate waste disposal management.

Weighbridge and automatic measuring equipment installed at the entrance of a waste disposal facility



Entrance and automatic weighbridge at a waste disposal facility

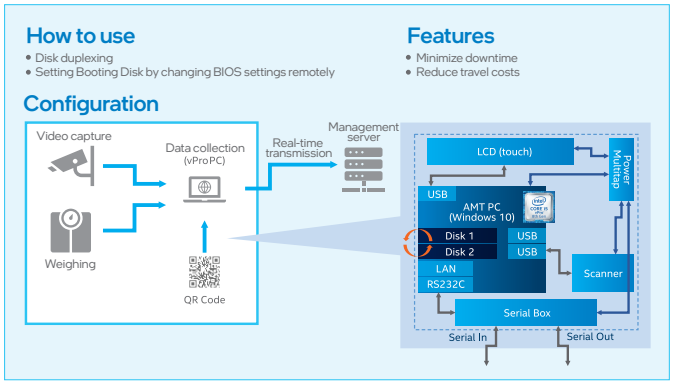
2) Intel® vPro® technology enables remote control, recovery, and management in a short time without on-site visits.

Most facilities are located far from downtowns, so a solution that can immediately address the problem of remoteness is essential. Intelligent kiosks equipped with Intel® vPro® can be remotely powered on or off, managed, and restored from a central control system.

Another strong point is disk duplexing. If a booting issue arises while the primary disk is in use, the remote administrator uses KVM of Intel® vPro® to enter the BIOS settings and changes the boot disk to a backup disk to resolve the issue and minimize downtime.

In addition, even if a facility arbitrarily switches off the kiosk, remote access to the log is possible. A facility may check whether kiosks are powered on or off, when power is turned on or off, etc., proactively so that a management company can find and fix the problems. Intel® vPro® technology allows real-time control without on-site visits, shortening fix times and drastically reducing maintenance costs.

■ **Real-time data processing collector utilizing Intel® vPro®**

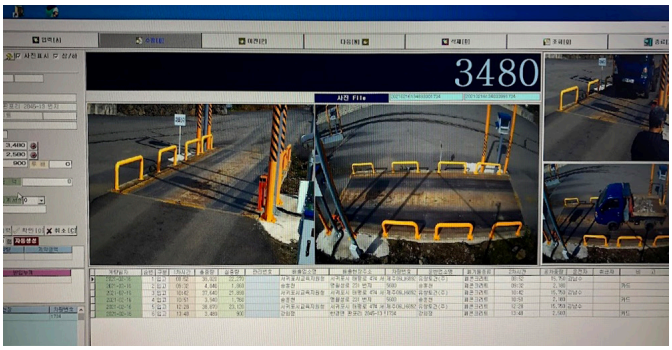


3) Kiosks with a built-in monitor and a simple power connection enable an easy-to-use experience.

Most waste disposal facilities are small, and there isn't enough staff to manage PCs. By simply plugging in an electrical cable instead of using a complicated computer, the Intel® vPro®-equipped-kiosk is simple and quick to operate. It is easy for everyone to use and small enough to fit into the offices of a small business.

4) Establishment of an integrated management system for waste disposal facilities scattered across the country

Through location tracking, travel routes and the amount of reported and transported waste are transmitted in real-time, enabling integrated waste disposal management, without visiting sites located across the country. This makes it possible to recognize patterns of waste disposal. If the data contradicts the pattern, you may recognize problems and address them in advance. It can also be a crucial resource for future research.



A mini PC-type kiosk distributed as a pilot project for the waste disposal facilities

Conclusion

Waste disposal is an essential issue that needs to be handled immediately and efficiently in a highly developed industrial society like South Korea. Nationwide, total costs of reported construction waste are in hundreds of billions of won, however there is a significant amount of cost disappearance due to inaccurate waste reporting. The research found that the difference between the automatically aggregated data and the actual reported amount of waste during this pilot project was as high as 15%.

Lee Won-hee, deputy director of the K-eco Resource Circulation Support Department, who manages this project, said,

"The biggest innovation of kiosks equipped with Intel® vPro® is that the entire process of waste measurement, collection, and transmission is digitized and completely transparent. In particular, the remote management of the Intel® vPro® platform could be easily managed from a central control system without visiting a facility far from downtown, shortening fix times and dramatically reducing maintenance costs. With Intel® vPro®, we were able to achieve results that satisfied both the government and the individual facility. We can establish an integrated government-level waste disposal system to protect the environment and prevent tax leaks."

K-eco is improving the digital infrastructure of individual facilities and solving problems in real-time through a transparent and integrated waste disposal system that can create synergy between the government and facilities. In addition, transparent waste management solves environmental problems and realizes economic effects by blocking tax leaks.