Next-Generation Vending Machine Based on Intel® Architecture Features Large Transparent Display Screen and Intel® AIM Suite - Anonymous Viewer Analytics

Collaborative Concept Model Supports Full HD Video and Rich Interactivity

Japan is a country with a large number of vending machines. These machines have undergone numerous enhancements over the years, including lottery ticket functions, the ability to accept high-denomination notes, and the adoption of technologies such as non-contact smartcards. One much-anticipated new function, digital signage, is expected to lead to even more sophisticated vending machines in the future. This new-generation advertising medium uses large screens or other display devices to present targeted information to people in the immediate vicinity. New-generation beverage vending machines equipped with large touch-screen displays and built-in cameras for facial recognition are already starting to appear in railway stations in the Tokyo region. Installing new vending machines with digital signage functions in high-traffic locations can further maximize the benefits of the vending machine and digital signage function.

For vending machines with digital signage functions to proliferate in the future, they will need to differentiate themselves with new ideas. To show what form these future vending machines might take, Intel Corporation worked with a number of other companies to develop a concept model of a next-generation vending machine with a large transparent display screen. The collaboration included a large Japanese manufacturer of vending machines, Okaya Electronics Corporation, which handles sales of electronic components and technical support, and a video content production company. This new concept model effectively combines a vending machine featuring the latest design, high-performance hardware based on Intel® architecture, a large transparent display screen, and high-quality content to attract attention. In place of the conventional large LCD screen, the model uses a transparent screen for the large display so that the products inside the vending machine and the display contents can be seen.

Simultaneous Display of Contents and Vending Machine Interior

This concept model involves positioning a large vertically oriented 65-inch transparent display on the front of the vending machine. With full HD (1920x1080 pixel) resolution, the transparent display can display text, photographs, and rich animations powered by Flash® or other software with a high degree of clarity. It consists of a conventional LCD panel with the backlight unit (light source) removed and behaves like a sheet of glass that can display an overlay of text, photographs, video, and other content. This allows users to watch various types of content on the display while the products positioned behind the display are visible through the glass at the same time. In this concept model, the products inside the vending machine are illuminated by high-intensity LED lights, which also serve to make the images on the transparent display visible.
A sensor device is mounted on the front of the vending machine, and Intel’s viewer analytics solution, the Intel® Audience Impression Metric Suite (Intel® AIM Suite), is used to anonymously identify basic characteristics of the person in front of the machine, such as gender and age bracket, so relevant content can be displayed. Because the transparent display is also a touch panel, menu selection and other functions can be performed interactively. When the vending machine is not in use, it attracts the attention of potential purchasers by displaying material such as a large digital clock or animations of animal characters. Then, when a purchaser stands in front of the vending machine, it displays content such as details of the products that the purchaser is considering or targeted advertisements. After the purchaser makes a selection, a cheerful animation plays briefly to express pleasure. The animation moves in sync with the robotic mechanism that transfers the product to the outlet.

Tasks such as the anonymous viewer analytics and the display of high-quality animation involve computational processing with a considerable degree of complexity. For this reason, the concept model uses the latest Intel® architecture-based hardware platform for the control unit. The microprocessor at the heart of the control unit is a 2nd Generation Intel® Core™ i5 Processor, which has already established its reputation in the PC world. The concept model also uses the Microsoft Windows® Embedded operating system (OS), which is optimized for embedded systems, because its compatibility with the latest Intel processors enables rich content featuring high-definition animation to play smoothly.

Intel® Architecture Supports Further Enhancements to Next-Generation Vending Machines

Intel anticipates that further enhancements to the vending machine will improve the concept model in the future, including digital signage functions that allow more effective advertising and the incorporation of new-generation user interfaces for superior interactivity. For example, more work is required to improve the display quality of content for use with transparent displays like the one in this concept model. Unlike with conventional displays used for watching videos and the like, viewers of the transparent display on the vending machine stand only a short distance away from the images being displayed. Because individual pixels become clearly distinguishable once screen sizes reach the 65-inch range, transparent displays with even higher resolutions and high-definition content will be required to display images in a way that does not draw attention to the pixels. For this reason, besides incorporating a steady stream of new ideas, controllers in next-generation vending machines will require a hardware platform with the capacity to prevent processing performance from becoming a bottleneck.

High-performance hardware platforms based on Intel® architecture are an ideal choice for genuinely satisfying these future requirements. Use of the latest semiconductor fabrication technology and microarchitecture means that Intel microprocessors provide excellent processing capacity and functionality, and they can handle the next generation of embedded applications with ease. Meanwhile, vending machines located throughout Japan will require solutions whose capabilities include managing display content, measuring the effectiveness of video analytics, and operating and managing the vending machine itself. Such management solutions typically run on a set of servers. In recent years, the number of such servers based on Intel® architecture has risen dramatically. These servers in turn run applications developed on Intel® architecture-based systems. The combination of servers and vending machines based on Intel® architecture further improves the compatibility between these devices when they are connected on a network. Other benefits include high processing performance, excellent functionality, and reliable operation for the overall vending machine solution.