

# Redefine the Automated Retail Business

Vending with intelligence based on Intel® architecture



## SOLUTION SUMMARY

Vending machines have a lot of potential to evolve. Instead of simple automated machines that sell drinks and snacks, intelligent vending machines based on Intel architecture can do so much more by enabling technologies such as cashless payment options, wireless inventory tracking, and informative digital displays. It's a better solution for everyone: customers can take their time to decide without having a salesperson to pressure them to buy, retailers and customers enjoy a frictionless shopping experience that is satisfactory and reliable, and vending operators and retailers can receive high returns by offering a spectrum of goods and services.

The Intel® Vending Design Reference Kit and Silkron Vendron software development kit (SDK) accelerates the development of intelligent vending machines. Vending machine operators, retailers, and advertisers have the opportunity to explore new marketing strategies with lower investment risks and reap the benefits of the automated retail business.

## Silkron

Silkron  
specializes in Smart  
Vending solutions.

## CHALLENGES OF THE AUTOMATED RETAIL BUSINESS

Customers today value convenience and choices, and the vending machine is an ideal way to meet their expectations. The advantage of vending machines is that they provide a low-overhead sales outlet in high-traffic locations where retail space is expensive.

The design of a conventional vending machine is usually low-cost and simple in its function. However, the operation cost may be expensive. These machines are unsecured and unsupervised, which lead to theft and vandalism. They only accept physical currency, so the products sold in vending machines are limited to low-priced items. Also, these machines require regular upkeep, which involves restocking the inventory, collecting the transaction proceeds, and performing operating maintenance.

Sometimes vending machine operators must also perform unscheduled visits to address vandalism or payment system malfunction. There is no way for vending machine operators to anticipate any sudden increase in demand that may leave vending machines running without inventory, leading to lost sales opportunities.

These are some of the operating challenges of conventional vending machines that raise the total cost of ownership (TCO) and lower the potential profits.

“Vending with intelligence based on Intel architecture, coupled with the smart vending software, will change the vending landscape by enabling many brave new possibilities.”

– Loh Yong Khun,  
Managing Director, Silkron

## Magnify Growth by Investing in Technology

The automated retail business is a mature business, but it has a lot of potential to grow. With the integration of technology supported by Intel® architecture, intelligent vending machines offer features and intelligent capabilities that far exceed society's expectations of vending machines.

Intelligent vending machines magnify your cost savings and achieve better return on investment by applying technologies into two areas:

- interactive graphics
- intelligent software

### Engage Customers Through Interactive Graphics

Multimedia displays on intelligent vending machines engage customers by drawing their attention using full-motion graphics. With interactive graphics, vending operators can push information to customers, collect information from customers, or even offer suggestions on alternative products.

Rich content, featuring high-definition graphics, requires a high-performance processor. The microprocessor at the heart of the Intel Vending Design Reference Kit is the Intel® Core™ processor, designed using the latest semiconductor fabrication technology and microarchitecture.

Another advantage of multimedia displays on vending machine is that vending machine operators and retailers gain another source of revenue by displaying advertisements. There is the potential for individual-specific advertisements based on the customers' gender, ethnicity, and approximate age. For example, women

customers are presented with perfume advertisements. Customers and retailers benefit from targeted advertisements. Customers feel that they are treated as individuals rather than as a group, while retailers gain higher profit through a more effective means of advertising.

### Complement Technologies with Intelligent Software

Security, inventory management, and maintenance concerns are addressed using intelligent software that complements the technologies added to vending machines. With remote manageability, vending operators can monitor and evaluate the operation of their deployed vending machines from any location on devices such as desktop PCs, tablet PCs, and smartphones.

The software that enables remote management capabilities runs on Intel architecture-based systems. In turn, servers that manage the data collected from deployed vending machines typically run on Intel architecture. The combination of servers and vending machines running on Intel architecture ensures excellent compatibility between these devices when they are connected on a network.

Another concern is the cost of upgrading an existing vending machine or building an intelligent vending machine that runs on Intel® architecture. Providing a set of application programming interfaces (APIs) that handles the communication between the controller and standardized vending machine hardware, the software provides opportunities for lower-cost upgrades, shorter time to market, and compatibility with future vending technologies.

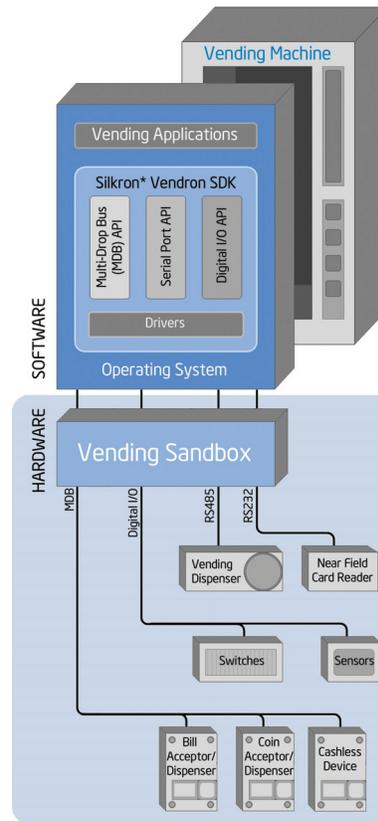
## The Intel Vending Design Reference Kit and Silkron Vendron Software Development Kit (SDK)

The Intel Vending Design Reference Kit includes a modular board to interface with existing vending machine hardware components. Commercial off-the-shelf (COTS) boards with Intel processors can be used — which reduce development and inventory costs — instead of using proprietary controller boards.

The Vending Sandbox interfaces the Intel architecture platform via USB and to the vending machine hardware via standard I/Os: digital I/O, Multi-Drop Bus (MDB) serial interface, and RS232/RS485 serial ports. This not only lets the Intel architecture platform to communicate with typical vending devices such as sensors, switches, currency acceptors, and currency validators, but also with new technologies such as digital displays, cashless payment options, and wireless communication.

Intelligent vending machines with Intel architecture can take advantage of the integrated graphics processor on the Intel Core processor, which accelerates video processing and enables high-definition content. Having onboard integrated graphics processor enables development with smaller form factors, fewer components, and greater reliability, while still delivering the performance-leading microprocessor for superior user experience.

The Silkron Vendron SDK is a package of tools to support the typical vending machine functions, as well as new technologies such as digital signage functions and remote management features. The SDK simplifies the development of the vending software via a set of application programming interfaces (APIs). Because it also provides a plug-in framework, new features can be added as they develop.



Silkron's smart vending software uses the Intel architecture platform to enable multimedia interactivity, digital signage functions, cashless payment options, and remote manageability. According to Loh Yong Khun, managing director at Silkron, "Vending with intelligence based on Intel architecture, coupled with the smart vending software, will change the vending landscape by enabling many brave new possibilities."

## FEATURES OF THE INTEL VENDING DESIGN REFERENCE KIT

In addition to I/O ports that interface with existing vending machine hardware, the reference kit supports various wireless interfaces, which includes WiFi/ WiMAX, 3G, and Bluetooth. Also included are four display interface options (HDMI, DVI, DisplayPort, and VGA) that provide a high level of flexibility and outstanding display quality.

For more information about the reference kit, download the white paper at <http://download.intel.com/embedded/applications/digitalsignage/325109.pdf>

## THE VENDING SANDBOX

The Vending Sandbox is an interface board that connects to the reference kit via USB and then connects to the vending machine hardware via standard I/O ports. The default configuration for the Vending Sandbox includes two MDB ports (upstream and downstream), eight digital inputs, eight digital outputs, two serial RS232 ports, and one serial RS485 port. These ports are modular, so more ports can be added, if required.

## The Intel Architecture Advantage

The Intel Vending Design Reference Kit and Silkron Vendron software development kit (SDK) are designed to take advantage of Intel architecture, which offers optimized energy efficiency, reliability, and manageability.

This solution accelerates the time to market when upgrading existing vending

machines or building intelligent vending machines that run on Intel architecture. These intelligent vending machines integrate technologies that enable vending machine operators, retailers, and advertisers to explore new marketing strategies with lower investment risks, discover new sources of revenue, and reap the benefits of the automated retail business.

For more information on smart vending solutions with intelligence based on Intel architecture:

[http://silkron.com/smart\\_vending\\_sdk](http://silkron.com/smart_vending_sdk)  
[http://silkron.com/smart\\_vending\\_hardware\\_kit](http://silkron.com/smart_vending_hardware_kit)

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