

-Vending Machines: How High-Quality Connectivity Reduces Costs and Increases Profits



The benefits of connectivity are easy to see. It is fundamental to processing card payments, making the purchasing process easy. It allows monitoring of stock levels and machine health, enabling automatic reordering and maintenance planning, and so reducing downtime and out of stock items. And it allows real-time communication with the machine, enabling analytics that support data-driven sales strategies, supply chain management and tailoring of customer experiences.

However, there is a difference between connectivity and great connectivity.

If the connection is not reliable, small periods of downtime result in lost customers, and big losses when scaled up across thousands of machines. Small problems lead to costly engineer call outs. Without universal connectivity across all machines, a proportion may fail upon initial deployment.

This paper explains the benefits of good connectivity, and the problems that arise from its absence, then concludes with key considerations for any connected vending machine strategy.



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– Connected vending machines in the time of COVID-19

In 2020, connected vending machines have taken on new value. They allow people to purchase goods with no human interaction. Most have contactless payments and some offer voice ordering to make the process touchless.

Remote operation reduces human involvement. Faults or updates can often be handled remotely. Both manual maintenance and restocking can be effectively planned to keep staff safe, whilst keeping machines fully operational.

Meanwhile, usage data can provide vital insight into evolving modes of consumer behaviour in uncertain times, and support promotions and customer-centric experiences, increasing spending and loyalty at a time when marketing is particularly challenging.



– The benefits of better connectivity for smart vending machines

Maximises number of transactions

A vending machine needs to be connected to retrieve any information the user needs to complete the transaction, most notably authorisation to process the payment.

Customers expect machines to be well-stocked, and their progression through the ordering process to be smooth and rapid, and are easily annoyed by technology. Connectivity downtime may mean machines cannot process payment, or are not restocked, or that easily resolved software glitches are not spotted. All of these lead to lost transactions and bad customer reviews.



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But even short dropped connections can mean lost business. A vending machine which takes 30 seconds to retrieve information may lead a customer to give up. Customers may never come back. If they had poor service or out of stock items, especially if a competitor's machine is just as easy to get to. The damage is not just a single lost transaction, but potentially a long-term loss of business.

The faster and more reliable the transaction, the more customers enjoy the experience, and the more likely they are to use your machine.



Works for the customer, wherever they are

It is hard to know exactly where your vending machine will end up. No mobile network has 100% coverage, and deploying vending machines across a country on a single network could mean 15-25% without a reliable connection.

This can even vary at a hyper-local level. A shop owner may have a network dead spot in the exact area they want the machine, and they will not want to have to redesign their shop layout to get better reception. If the machine doesn't work with the owner's needs, it will either be returned, or used sub-optimally. If it does not meet the revenue expectations of the machine provider, it could be recalled at an additional cost.

Connectivity designed to work everywhere will ensure a good user experience, regardless of where the machine is positioned.



Create unique customer experiences

The two-way flow of real-time information between vending machines offers an opportunity to create unique customer experiences that maximise sales and profitability. Some companies have developed apps that increase customer convenience, for example, a single swipe could deliver your regular choice of hot drink. This customer data allows hyper-targeting of promotions and advertising on digital signage. It also encourages buying from people who are rushing, and shortens queues, thereby increasing turnover. Reliable connectivity is key to ensuring this works every time.



If the vending machine is designed to connect the moment it is switched on, right out of the box, none of this is a problem.



Generates revenue from the moment it arrives

If a device requires even simple setups – e.g. entering WiFi passwords on keypads – some will not bother, or will wait until they have time, or will set it up incorrectly, all leading to lost revenue. At the very least you will get frustrated calls to your technical support team.



Provides continuous monitoring and insights

A continuous flow of data gives valuable insights into consumer behaviour and device health. It can notify support staff if there is a pre-defined problem, and also alert them to unusual behaviour that may indicate a problem (e.g. no transactions during a usually busy period), so it can be quickly solved.

This is especially valuable for automated analytics or AI (artificial intelligence) to deliver meaningful insights, or push offers to customers, which benefit from reliable data being fed in.

Unexpected disruptions in the time series may mean a missed promotional opportunity or a misdiagnosis of a problem.

Universal connectivity ensures a continuous flow of real-time data and operating information from smart vending machines, which back-end systems can act upon intelligently. This data also feeds into research and development to create new products and experiences to meet new customer expectations or to capitalise on market growth opportunities.



Reduces support costs

Many call outs could be easily addressed remotely (turning it off and on again, for example). Others turn out to be network problems unrelated to the machine, which the engineer can do nothing about. Still, others require a network change which could have been avoided by better connectivity decision early on.

With better connectivity, many call outs would be avoided. Software issues can often be resolved remotely. Analysis of network traffic can help identify if the problem is with the machine or the network. Callouts can be limited to when they are really needed.



Enables a single design for a global market

Vending machines are simpler to set up than staffed outlets, which makes them an ideal low-risk way to enter or expand in new international markets. Ensuring that a single design works anywhere in the world removes a major distribution and maintenance headache, reducing the need to negotiate global network and support contracts and manage billing from multiple suppliers in multiple currencies.

– Creates opportunities for distribution

The Internet of Things creates opportunities for new revenue streams and disruptive business models. Predicting the future is hard, but most agree it will be more digital and more connected. A world that has lived through a pandemic may see more demand for services that minimise human interaction. Vending machines could provide a sales

channel for more products, from FMCGs on street corners, to organic produce where you swipe your card to open the door and cameras detect what you took so they can charge you. Meanwhile, facial recognition could be used to make personalised recommendations or offers.

Vending machines can be further monetised through digital advertising displays which can be remotely and dynamically updated. Advertisers could even run campaigns which are updated in real-time, and in future could even be individually targeted at people walking past.

High quality connectivity allows businesses to think outside the box and continually take advantage of new technologies and respond to changing customer habits.



– Case study: Costa Express

Costa Express's vending machines deliver barista-quality coffee with the same highquality ingredients as stores. Machine upkeep and uptime are critical to deliver quality drinks every time.

The machines are all managed and monitored at the backend through the Centresight IoT platform which covers payment capture, swift maintenance, and timely restocking of fresh ingredients. Seamless connectivity between machines and this platform was vital.

Costa Express investigated several connectivity solutions, including on-site Ethernet or cellular connection. Ethernet meant relying on the site owner's connection, where a failure would lead to lost business, frustrated customers, and trigger engineer site visits.



They finally settled on Eseye's AnyNet SIM and Hera router. **The SIM connects to any available mobile network, enabling connectivity anywhere as soon as one of the 9,000 plus machines are powered on.**

As well as connectivity, the embedded device provides health monitoring, time synchronization and data route information. This allows Costa Express to act swiftly to ensure site staff replenish milk and coffee levels, and that important machine functionality such as coffee grinder or boiler performance is monitored.

This approach has also allowed Costa Express to reduce total cost of ownership of their vending machines, by simplifying their supply chain across IoT design, build and management, and enabling them to easily deploy almost anywhere in the world.



Eseye's fully redundant fault-tolerant network provides a managed connectivity service with a global footprint, whilst support for multiple cellular networks in each geographical region enables close to 100% connectivity uptime. This means we can deliver premium quality drinks virtually anywhere in the world. A real advantage as the company is seeking to expand rapidly across international markets."

Paul Borrett,
Systems & Data Director, Costa Express

– Key considerations for connected vending machines

How Eseye can help improve vending machine connectivity and profitability



We hope from reading this paper, it will be clear that continuous reliable connectivity reduces design, maintenance and management costs, and improves lifetime profitability. In this final section, we discuss the key consideration for getting connectivity right and how Eseye can help.

1. Ensure reliable, continuous connectivity that can process transactions quickly and efficiently

Most vending machines are WiFi enabled. But many will be positioned outside of WiFi zones (such as remote bus stops) or not allowed on the local network, or face interruptions when there is a modem issue, or the password is changed and no one thinks to update the vending machine. Mobile network connectivity has the potential to offer near-100% uptime.

However, consumer-grade SIM fall short of this. To optimise network use, they deliberately drop connections to idle devices. For vending machines aiming to deliver an easy buying experience, making customers wait whilst they reconnect can cost business.

Connectivity built for IoT applications such as Eseye's AnyNet Secure SIM card, can deliver weeks of continuous connectivity without dropping, because they are built on networking infrastructure designed to provide highly available services. Eseye has also supported vending machine manufacturers throughout design, build and deployment to ensure devices make the most of high-quality connectivity. This ensures that when customers use the machine, it always works instantaneously without taking a minute to re-establish a connection.

2. Deliver ubiquitous connectivity and mobile network flexibility

Mass-produced vending machines will end up in places with different levels of coverage. One solution is to assess each location as part of the deployment and install different network SIM cards, according to best coverage. A more convenient solution is to use a single SIM technology, such as Eseye's, which has negotiated agreements with all the major mobile network operators and can manage the best option for each individual asset.

This approach also offers future-proofing. Networks that work well at deployment may deteriorate, or other networks may build new masts, changing the calculus. Owner may want to move the machine to another part of the shop or to another shop entirely.

An intelligent Eseye SIM can be programmed to switch network, either locally or remotely over the air, if the connection drops or the environment changes. This allows ongoing optimisation, should terminals move, or networks have faults or congestion issues.

3. Consider international needs

If machines may be deployed globally, a connectivity solution that works anywhere in the world will save a lot of time and money.

Rolling out devices in different countries can mean multiple relationships with different mobile network operators to achieve coverage in each area. Market differences, such as such as restrictions on permanent roaming (where a device might be disconnected after three months), may need to influence your manufacturing and supply chain.

Devices with Eseye connectivity work out of the box anywhere. This is because Eseye has relationships with over 700 mobile networks around the world, and understanding of local connectivity and data processing challenge, allowing businesses to build connectivity into devices rather than installing it locally.

4. Manage data through a single platform

If you're managing lots of vending machines it makes sense to do so through a single platform, where you can compare performance via a dashboard. This also allows easier upgrades and the addition of new services in future.

Using a single connectivity solution makes this process much simpler. Eseye's IoT managed service platform provides unified deployment, control and billing all handled centrally to support ongoing device management. **Our real-time dashboard delivers data insights through automated data transfer that is registered, secured, monitored and analysed in your cloud platform.**

5. Consider total cost of ownership

Finally, don't think of connectivity as a piece of technology but as part of a long-term cost management approach. Consider not just the upfront cost of the connectivity solution, but the lifetime costs of engineer call-outs to fix issues, reconfigure machines and switch SIM cards. Consider the cost of hiring people to manage multiple service contracts, and having to work with complex networks of suppliers.

Consider the impact on your brand that a seamless - or frustrating - customer experience brings.



– Summary

Connectivity is not just a technical consideration but one on which long-term business models depend, and increasingly one which offers an opportunity for innovation. Good, reliable connectivity often goes unnoticed. But poor connectivity causes delays to deployment, leads to unnecessary downtime, reduces revenues and alienates customers.

Vending machine companies should aim high when it comes to connectivity, in order to deliver the best long-term service for their customers, allowing them to continually innovate and maximise revenue opportunities.



No Limits.



To talk to Eseye about the issues raised in this whitepaper or discuss smart vending machine solutions, please

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