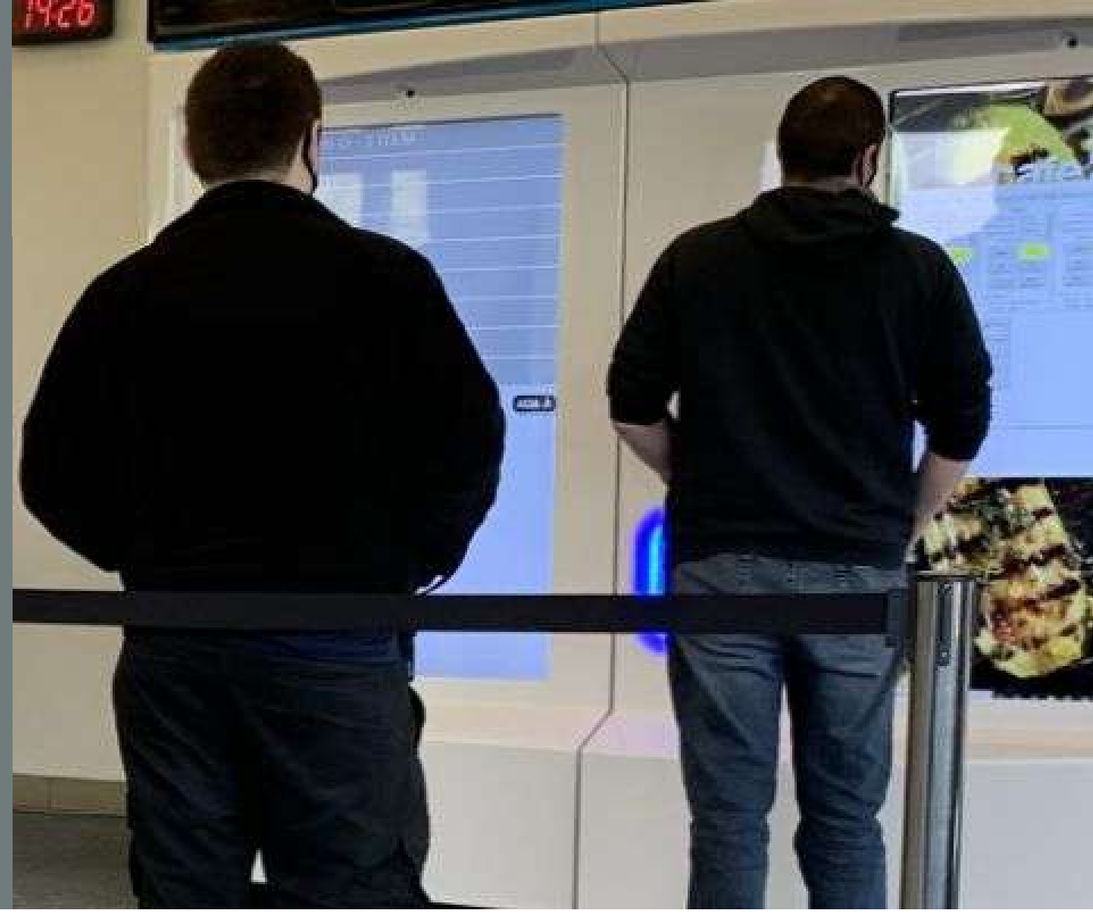
DEATON ENGINEERING
YOUR VISION, OUR PRECISION

CASE STUDY

Deaton Engineering Helps Design & Build Automated Food Kiosk



The Client: JUKKA Inc

JUKKA was founded on the concept of offering an endless variety of foods to a broad consumer audience where and when convenient for their busy lives. With all the smart technology available, their mission was to harness this, in innovative ways, to accelerate brands and improve consumer experience with foods on the go.

The Challenge: Reimagining the Vending Machine

In 2014, JUKKA approached Deaton Engineering to help bring this vision to life by designing a smart kiosk that can store, heat, and vend a variety of snacks, entrées and desserts. Equally important was form factor, which had to be elegant and unlike the vending machines of the past. Transactions were to be cashless and secure, and customers would have the option of ordering in-person at the machine or through a mobile app. In order to enable efficient, centralized management of a large number of kiosks in the field, the machines must be IoT-enabled and connect through an elastic cloud infrastructure. Most importantly, all design objectives were undertaken with the USDA Food Safety Code in mind.

The Solution: Smart, Automated Kiosk

Deaton worked with JUKKA and other world class partners in industrial design, software development, back-end infrastructure, and user experience architecture to deliver the JUKKA vision. Given the high-end design sense and sophisticated use of smart technology, Deaton's approach was to design this machine to industrial standards, with major components organized in a modular fashion. This would allow for ease of maintenance, technology upgrades and varying customer requirements.

In 2017, Deaton completed a pre-alpha unit to prove the design of a 3-axis centralized robotic arm that would serve as the primary product conveyance throughout the machine. At the same time, Deaton engaged with several leading refrigeration companies to customize a refrigeration/freezing system that would allow JUKKA the ability to adjust storage temperature at will. This system met new regulations using a refrigerant that required specific safety and design concerns. Software design, UX architecture and back-end systems infrastructure were underway in preparation for the next phase.

By 2019, a functional alpha unit was completed and available to demonstrate JUKKA's vision to potential industry clients from CPG, retail, restaurant chains, etc. This alpha served everything from breakfast sandwiches to cinnamon rolls to barbeque brisket at or better than restaurant / manufacturer quality standards. All the while, Deaton continued to evolve the design to incorporate eID verification features (for example, age and/or identity-controlled items) and impending health safety considerations (e.g., COVID-19).

By 2021 – during a global pandemic – Deaton delivered a functional beta unit, ready to deploy in a consumer field test for JUKKA's strategic partner, a global contract foodservice company. They chose an essential business – a large semiconductor facility in Austin, TX – to serve as the primary source of a hot meal for hundreds of swing shift employees. This unit included timely health safety features, such anti-microbial coated touch screens and UV sanitation for high-touch areas. Due to COVID-19, it was important for this field test to be monitored by JUKKA and Deaton teams. Taking advantage of this situation, JUKKA and Deaton proceeded with active mechanical and software engineering updates throughout the field test. Because of these aggressive, continuous improvement efforts, Deaton has well-positioned JUKKA for the next phase: Design for Manufacturing (DFM) with the OEM of choice.

Engineering Highlights:

- Multi-axis robotic conveyance to move the product between refrigeration, heating, and dispensing/presenting positions
- Custom, automated refrigeration/freezing system to house multiple product types and dispense in the proper order, with customized software-switchable temperature control
- Microwave customization to allow ingress/egress. Product reheating settings by product, and sanitization
- Additional customer-interactive features such as: facial recognition cameras, integrated microphones and speakers, and customer-interface lighting
- Multiple product verification features (bar code readers, product present sensors, etc.)
- Integral displays with touch-screens for order entry and machine control
- Machine controls integration with front and back-end systems
- Full concept ideation to detailed design, test, and build
- Payment hardware and third-party processor certification
- Proprietary product packaging design
- Unique modular frame to support high-end fascia, prevent tampering, and allow for ease of assembly and service/maintenance

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