Intel® IoT Gateway Technology in Healthcare Use Case

Introduction

In an ever more competitive market, healthcare organizations are increasingly facing the simultaneous challenges of improving the quality of service, reducing costs, and generating new revenue streams.

Healthcare organizations are acutely aware that new technologies offer the promises of efficiencies, value, and profitability. However, stringent compliance regulations, and limited IT budgets counteract these promises. Additionally, large healthcare organizations are traditionally slower to adapt to new IT service delivery methods and these facts combine to prevent healthcare organizations from investing sufficiently and effectively in healthcare IT.

Additionally, healthcare organizations increasingly want to facilitate collaborative care among teams, to enable them to make the best decisions, spend more time with patients, and drive improved outcomes.

This use case scenario details the example of a healthcare organization embracing an IoT solution to achieve these goals.

Challenge

While each case will present unique challenges, broadly speaking healthcare organizations looking toward 'digital health' and 'public health' are aiming to evolve towards the following three objectives.

The first objective is to design and build a scalable, patient monitoring system using affordable COTS Internet of Things devices for home care and assisted living to enable the transition from episodic to continual data collection.

The focus here is physical activity tracking, body measurements, and sleeping patterns - especially with regard to wearable technologies. These devices are able to provide clinicians with highly desirable real time insights into a patient's health, history, and daily routine.

The second objective is to develop a risk prediction model using aggregated data from labs, claims, medical records, in home clinical devices, wearables, sensors, and applications to collate patient data and provide actionable insights for care teams.

The ambition here is broader 'Public Health'. This aims to process streaming data as close to the sensor as possible, enabling a real-time turnaround of insights before data is stored for additional analytics, additionally eliminating potential bottlenecks while enabling massive scalability.

Thirdly, the seamless integration of the wider IoT connected business into current assets.

As with a number of large organizations, growth evolves organically leading to disparate systems and even distinctive departmental cultures. With this in mind, a system must be fully interoperable to achieve broad-based success.

Solution

Compact, smart, secure, and able to reside on the edge of a network connecting smart sensors and devices to the cloud wirelessly or locally, Intel® IoT Gateway Technology solutions are ideally suited for deployment into exactly this type of vertical. Moving ahead, companies with end-to-end IoT strategies based on powerful Intel® IoT Gateway Technology are poised to realize the most value. Solutions based on this technology provide leading performance and security for intelligence at the edge, enabling near real-time analysis and tighter, more efficient process controls, while reducing data transmission costs.

Intel® IoT Gateways are entirely customizable from reference architecture to ensure interoperability between systems, for ease of deployment, and underpin a massive ecosystem of solution providers.

A popular example within that ecosystem is the AAEON (non-breaking space) UP (non-breaking hyphen) GWS01 pleasewith full support for Intel® RealSense™ technology. The AAEON UP-GWS01 features a credit-card-sized single-board computer designed around quad-core Intel® Atom™ x5-Z8350 ProcessorProcessor SoC. which provides stunning graphics performance in a low-thermal envelope for superior visual computing in edge devices. Further, the wide-ranging variety of I/O enables an outstandinga stunning degree of expandable functionality.

The UP board is a perfect professional maker board ideally suited for vertical integration into IoT and IIoT roles. The UP board partners with an Intel® RealSense™ Camera to offer a complete eco-system including Wi-Fi, Bluetooth, 3G, and touch display.

The AAEON UP-GWS01 houses the UP board in a discrete, two-piece, rugged chassis with 75/100 VESA mounting options available. Extruded thermal fins form the upper part of the chassis enabling the system to remain fanless and free of moving parts. This scale of durability ensures the AAEON UP GWS01 is ideally suited for long-term deployments in both domestic and demanding environments.

Easily integrated with, and enhanced by the full-range of sensors available in the commercial marketplace, patient gesture recognition, facial recognition, are all readily available and easily deployed. This enables incredibly rapid prototyping and a massive degree of customization down to granular patient requirements.
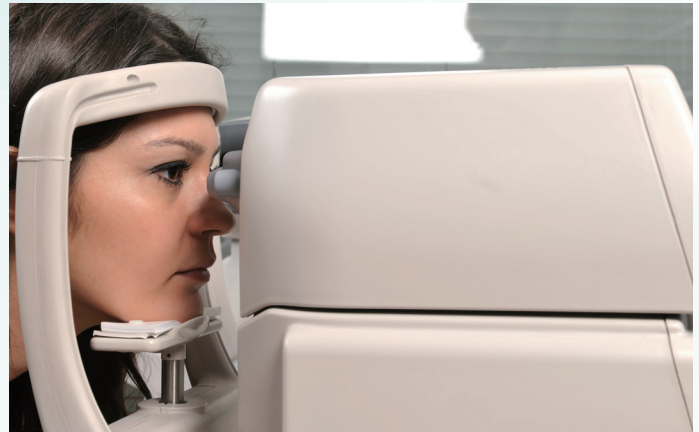
Certified by Microsoft® Azure®, partnered with Microsoft® Azure®, and using Power BI™ cloud, the AAEON UP GWS01 based on the Intel® IoT Gateway solution enables integration with a range of additional services including central pricing management, and real-time data analytics for healthcare organizations of all sizes.

Deploying the AAEON UP-GWS01 in an IoT Gateway role enables users to securely aggregate, share, and filter data for analysis and ensure that data generated by devices can travel securely and safely from the edge to the cloud and back – without replacing existing infrastructure.

Connected devices such as tablets, online portals, and kiosks streamline workflows enabling caregivers to do their best work, by providing a natural and personal user experience and easy access to patient data and imagery, diagnostic tools, and medication and insurance information. By gathering this data patterns can be drawn on usual behavior or routines, and can alert social services (or emergency services) of any abnormalities or issues.

Benefits

In selecting suitable frameworks and partnerships with cloud service vendors, healthcare organizations can meet the aforementioned challenges head-on and transform their operations to bring about the true potential of technology.

Contemporary technology solutions and IT service delivery models enable organizations to use technology to improve business processes and to generate new revenue streams. Historically, IT has rarely been used as a means to generate revenue among organizations that do not primarily offer technology.

This is expected to change dramatically in the near to medium term, as organizations realize that the cloud enables them to use technology beyond internal IT functions and maximize returns on IT investments.

Reduced non-essential visits leads to an increase of staff enabling caregivers to focus their attention more effectively. This more efficient staffing both improves treatment outcomes and reduces costs. Additionally, predictive modelling based on more granular, continuous data streams enables an improved patient experience through proactive treatment. Further, generated data aggregated through automated processes will result in a reduction in errors.

To summarize, this use case attests to the fact that the simultaneous challenges of improving quality of service, reducing costs, and generating new revenue streams are achievable. In fact, the Intel® IoT Gateway promises of efficiencies, value, and profitability, in the face stringent compliance regulations, and limited IT budgets appear entirely realizable and wholly encouraging for healthcare providers of all sizes.

ABOUT AAEON

Established in 1992, AAEON is one of the leading designers and manufacturers of advanced industrial and embedded computing platforms today. Committed to innovative engineering, AAEON provides integrated solutions, hardware and services for premier OEM/ODMs and system integrators worldwide. Reliable and high quality computing platforms include industrial motherboards and systems, industrial displays, rugged tablets, PC/104, PICMG and COM modules, embedded SBCs, embedded controllers, network appliances and related accessories. AAEON also offers customized end-to-end services from initial product conceptualization and product development on through to volume manufacturing and after-sales service programs.

With a continuous pursuit of innovation and excellence, AAEON became a member of the ASUS group in 2011, further strengthening its leadership fueled by advanced technology from ASUS and leveraging resources within the group. AAEON is posed to offer more diversified embedded products and solutions at higher quality standards to meet world-class design and manufacturing demands in the years to come.

AAEON is an Associate member of the Intel® Internet of Things Solutions Alliance.

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