

Case Study: A Sensor to Simplify Shopper Measurement

A Qualcomm® Snapdragon™ 800 Series Processor Case Study
Featuring RetailNext and Intrinsic Technologies



Case Study Highlights

- + **BACKGROUND** — RetailNext is a worldwide expert and market leader in retail analytics, based in San Jose, CA. They needed to optimize the scope of features, cost and schedule of their new Aurora sensor and deliver a commercial-ready product in less than 12 months.
- + **SOLUTION** — Using a Snapdragon 800 series processor, RetailNext created Aurora, an all-in-one sensor integrating HD video, Wi-Fi, and Bluetooth into a single, stylish device, designed specifically for the complex needs of retailers around the globe.
- + **RESULTS** — RetailNext went from initial specifications to the first prototypes in just 3.8 months and subsequently manufactured and delivered 7,750 Aurora units in less than a year.

“Rather than deploying a ceiling full of sensors, Aurora allows retailers an option to install a single device, designed and built for retail’s specific needs, and one that is both aesthetically pleasing and seamlessly integrated with the RetailNext platform.”

- Arun Nair, RetailNext CTO
& Co-Founder

Introduction: Next-generation Sensor for Shopper Measurement

The Internet of Things (IoT) greatly impacts the retail industry by connecting devices such as computers, smartphones, wearables, and various store technologies with one another. A key benefit to retailers in connecting these “things” is the vast amount of data generated, which can then be used to improve the customer’s decision-making process.

Traditional brick-and-mortar retail stores need to better understand the shopper journey in order to compete with the giants of e-commerce. Retailers need advanced in-store analytics to measure in-store traffic, examine loss prevention, and analyze store operations.

Since 2007, RetailNext has created powerful, comprehensive analytics tools that monitor elements such as loss prevention, operations, multi-channel efforts, and marketing. Aurora is RetailNext’s newest tool, a cutting-edge sensor that fuses video analytics, Bluetooth, and Wi-Fi technologies to simplify shopper behavior measurement.

The Aurora sensor features a Snapdragon 800 series processor designed to track and collect data on shoppers, measuring how long customers stay in the store, what they buy, and what they engage with. This provides powerful insight into store operations, marketing initiatives, staff levels, loss prevention, and more. Traffic data can be integrated with in-store POS feeds to provide key performance metrics, such as conversion rates, across all stores, in real time. From the moment a shopper walks into a store, useful data can be gathered and analyzed to help retailers guide shoppers to find what they need and make their way to the checkout.

The advanced sensor utilizes stereo vision and on board analytics to help accurately collect and measure store traffic and customer navigation while automatically excluding store staff from traffic and key metrics. It can also isolate employee paths to analyze interactions between sales associates and shoppers. Aurora can measure the entire shopper journey, including new versus repeat customers, visit frequency and duration, pass-by traffic, capture rate, and more.

Aurora works with RetailNext’s cloud-based software and on-premise solutions, allowing retailers to optimize the shopping experience by going beyond traditional traffic counting and conversion. By utilizing Aurora’s built-in beacon capabilities and data from Wi-Fi enabled smartphones, retailers can engage shoppers as they enter a store, without the need for servers or additional beacon hardware.



The Power of Snapdragon 805

- + Fast performance and more multitasking with Qualcomm® Krait™ 450 quad-core CPU at up to 2.7 GHz per core
- + 4K Ultra HD video with HEVC (H.265) playback and H.264 capture for bandwidth and power efficiency
- + Dual image signal processors (ISPs) support ~1GP/s throughput and image sensors up to 55 MP
- + Integrated Wi-Fi and Bluetooth



Working with the Snapdragon Platform

The RetailNext team was first introduced to Qualcomm Technologies through their relationship with Qualcomm Ventures, who invested in the company in 2014. On top of the investment dollars used to help portfolio companies like RetailNext grow, Qualcomm Ventures prides itself on supporting these companies with cutting edge technologies and access to technical knowledge that leads to success. In the case of RetailNext, the technology that made the difference was the Snapdragon platform.

The Snapdragon 805 processor features the quad-core Krait 450 CPU and is designed to support comprehensive 4K Ultra HD, with 4K video capture, 4K video playback on device, and 4K video output, all with outstanding battery life and processing efficiency. This Snapdragon 800 series processor is engineered to support advanced edge computing so that shopper tracking, mobile device detection, employee exclusion, and video storage can be processed right on the device. Thanks to the Snapdragon processor, most of the analysis and data gathering occurs using computer vision technology (CV) on the Aurora sensor, with some additional processing handled in the cloud. RetailNext's proprietary cloud platform is designed to provide retailers with a user interface (UI) to access their devices from anywhere to manage key metrics, specify queries, set parameters, retrieve data reports, and perform remote upgrades.

With multiple Aurora sensors, each camera sends tracking information on customers and how they spend their time in the store to the cloud. In the background, the cloud platform stitches the tracks together, providing a comprehensive picture of shopper movement and behavior. Since this cannot be covered with a single camera, the processing is done in the cloud.

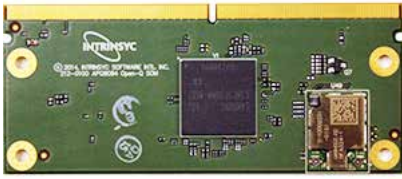
Stores often dedicate their limited connectivity bandwidth to credit card processing, so having more of the processing done on-device, without the need to upload video to the cloud – eliminating the need to put a server in the store – is a very valuable feature. Since the Snapdragon 805 processor has two image sensor processors directly on the application processor, and is capable of interfacing with Wi-Fi and Bluetooth, it was a perfect choice for capturing data and running the device application software.

However, the most important factor in deciding to use a Snapdragon processor for the Aurora sensor, as explained by Bill Adamec, R&D for RetailNext, was that Qualcomm Technologies allows smaller companies to access and use their technology. "We needed the advanced processing capabilities of the Snapdragon platform," Bill adds, "but we also needed to be confident that we were working with a company that has the kind of business model and infrastructure to support a small customer like us."



Custom Capabilities Provided by Intrinsic

RetailNext utilized Intrinsic's production-ready Open-Q™ 805 System-on-Module (SOM) featuring the powerful Snapdragon 805 processor from Qualcomm Technologies, Inc. (QTI). The SOM's ultra small form factor, advanced technology, and extensive range of supported peripherals provide an ideal platform for creating low-cost, high-performance embedded devices.



Qualcomm Technologies' solutions for embedded computing include an ecosystem of technology providers, such as Intrinsic Technologies Corp., who provide development platforms as well as off-the-shelf and custom modules based on select Snapdragon processors.

The Intrinsic development platform based on the Snapdragon 805 allowed the RetailNext team to add and take away – in a custom fashion – capabilities needed for its purposes, and the processor's integrated ISP, video encoder, GPU, and DSP proved vital for the sensor's analytic computations.

About Intrinsic

- + **Company Name:** Intrinsic Technologies Corp.
- + **Description:** QTI licensee and a leader in product development for the embedded systems market based on Snapdragon
- + **Location:** Vancouver, BC, Canada

Results

RetailNext needed to optimize Aurora's scope of features, cost and schedule, all while delivering a commercial-ready product in less than 12 months. Utilizing the Intrinsic development kit, combined with Intrinsic integration services, RetailNext went from initial specifications to the first prototypes in just 3.8 months. With less than a year's effort, RetailNext manufactured and delivered 7,750 Aurora units, allowing retailers to achieve up to a 50 percent reduction in hardware capital expenditures, with an additional 40-80 percent reduction in deployment and installation costs.

For More Information

- + Visit www.retailnext.net for more information on RetailNext and the Aurora Sensor.
- + Visit www.qualcomm.com/products/snapdragon/embedded-computing and <https://developer.qualcomm.com/getstarted/embedded-computing> for more information on Snapdragon processors and development kits for embedded processing.
- + Visit www.intrinsic.com for more information on Snapdragon product development.

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