# BUILDING INTELLIGENCE INTO RETAIL SOLUTIONS

**SOLUTION BRIEF**

> **"**Retailers seem to be turning a corner in terms of using new technologies to better understand their business and connect with customers. In fact, Lightspeed POS recently found that, compared to last year, twice as many independent retailers are currently investing in technology that uses data analytics and software to make smarter buying decisions.**"**[1]

JOE JENSEN
VICE PRESIDENT OF INTEL'S RETAIL SOLUTIONS DIVISION

## INDIVIDUALIZING CUSTOMER EXPERIENCES

A confluence of technologies – including artificial intelligence (AI), machine learning, and big data analytics – are casting new light on consumer preferences and behaviors, revitalizing retail operations worldwide. As retail strives to redefine itself to adapt to large-scale digital disruption sweeping the industry, Intel and Red Hat are smoothing the path to more effective retail operations by providing tools and technologies that focus on the intelligence that drives sales and customer behavior. To build effective data-driven, customer-centric sales venues – across online and traditional physical environments – advances in AI and machine learning are introducing new ways to customize and personalize the customer experience.

In its quest to harness the power of advanced analytics, Intel has built capabilities into the new Intel® Xeon® Scalable processor, optimized for advanced analytics to more easily extract actionable insights from massive data stores. When dealing with massive data volumes required for AI, machine learning, and analytics, Red Hat offers software-defined storage solutions that fulfill the need for scalable, exponentially increasing enterprise storage. Both companies are working on solutions that help engage customer interest when shopping, such as automatic visual and speech recognition, virtual reality enhancements of product characteristics, searches triggered by voice or visual prompts, and similar applications that are extending the boundaries of today's retail environments.

## ARTIFICIAL INTELLIGENCE MATURES

With affordable processing power and AI solutions reaching maturity, data analytics has become a powerful tool in the hands of retailers. Offshoots of AI – including machine learning and deep learning – have significantly advanced the ability of retailers to better focus sales and marketing efforts and map customer behaviors and preferences.

These same technologies work to add efficiency across the supply chain, develop models to apply predictive and prescriptive analytics to retail operations, and capitalize on insights to determine the best ways to engage customers.

Despite improvements in the application of analytics, a study by McKinsey revealed that 60% to 70% of the potential value of data and analytics was not captured by U.S. and European retailers in 2016.[2] The primary challenge is that much of the data is locked in siloes because of the traditional systems in use. The strong push toward unified commerce by Intel and Red Hat's efforts to establish converged technology in the retail sector should help break down the obstacles to more effective use of analytics in this sector.

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1   "New Intel-Powered Retail Experiences to Hit Stores This Year." BusinessWire. 2016. http://www.businesswire.com/news/home/20160118005416/en/Intel-Powered-Retail-Experiences-Hit-Stores-Year

2   Henke, Nicolaus, Jacques Bughin, Michael Chui, et al. "The age of analytics: Competing in a data-driven world." McKinsey & Company. 2016. https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-age-of-analytics-competing-in-a-data-driven-world
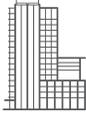
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To spur adoption and innovation in the AI ecosystem, Intel has invested USD 1 billion of strategic investments to drive research and development in this field, spanning government, academia, and community groups, as well as enterprises venturing into the field.[3]

As a leader in advancing the enterprise open source ecosystem, Red Hat has been active in building communities around open AI solutions and supporting organizations that further these goals.

## TECHNOLOGIES THAT ENABLE ARTIFICIAL INTELLIGENCE

Technologies from Red Hat and Intel that can further applications of AI in the retail sector include:

**Red Hat® JBoss® Data Grid:** Operating at the business analytics layer of the software stack, this solution analyzes data and intelligently adapts business rules by tracking historical trends.

**Intel® Nervana™ Neural Network Processor:** Designed expressly to support demanding AI applications at the enterprise level, this processor promises to revolutionize AI performance and scalability with the goal to achieve 100 times greater AI performance by 2020.[4]

**Red Hat OpenShift:** This Platform-as-a-Service solution supports large-scale, cloud-based Internet of Things applications with tools to rapidly develop and host retail implementations.

**Intel® Movidius™ Myriad™ X vision processing unit (VPU):** Featuring a dedicated neural compute engine to accelerate deep neural network inferences, this third-generation VPU is purpose-built for demanding AI and deep learning implementations.

**Red Hat Gluster Storage:** Given the massive volumes of data generated and analyzed in artificial intelligence solutions, Red Hat Gluster Storage provides essential management of unstructured data in physical, virtual, and cloud environments, supporting petabyte-scale data increases effectively.

**Technology from Mobileye:** Advanced 3D vision technologies provided by Mobileye can support autonomous robots in retail warehouses that can monitor inventory, pull products for orders, and learn to navigate unfamiliar environments to perform a wide range of tasks.

*"Open source has become the default for AI. Things are accelerating because we are making the tools and the data more accessible. So that means that more people can get started doing research and playing with algorithms."*[5]

FRANÇOIS CHOLLET, PROMINENT AI RESEARCHER AND AUTHOR OF KERAS, AN OPEN SOURCE NEURAL NETWORKS LIBRARY

## MERGING I.T. AND O.T.

Red Hat and Intel, with a rich history of co-developing standards-based technologies that have reshaped information technology and operations technology, are key players in the retail sector with solutions that bring intelligence into retail engagements and offer smart options for building long-term customer relationships. Contributions by both companies to the development of AI solutions will enable retailers to know more, through predictive analytics, and make better decisions by relying on deep learning. Modernized IT infrastructures running Red Hat Enterprise Linux® on Intel® architecture-based hardware make it possible for intelligence to be accessed and applied by retailers in real time.

3   Krzanich, Brian. "Intel Invests $1 Billion in the AI ecosystem to fuel adoption and product innovation." Intel Newsroom. 2017. https://newsroom.intel.com/editorials/intel-invests-1-billion-ai-ecosystem-fuel-adoption-product-innovation/

4   Krzanich, Brian. "Intel Pioneers New Technologies to Advance Artificial Intelligence." Intel Newsroom. 2017. https://newsroom.intel.com/editorials/intel-pioneers-new-technologies-advance-artificial-intelligence/

5   "A.I. Revolutionaries. Red Hat. 2017. https://www.redhat.com/en/open-source-stories/ai-revolutionaries