FORRESTER®

The Total Economic Impact™ Of Intel AI Spotlight: Engaging Software Developers

AI solutions help enterprises become industry leaders, but many enterprises struggle to deploy, monitor, and govern AI models in production applications. The process of building, training, and running models — and then putting them into production — is long and fraught with challenges.[1]

To scale AI/machine learning (ML) initiatives from one model to thousands, organizations must optimize deployment, monitoring, and governance. When considering an organization's deployment capabilities, the hand-off from data scientists to software engineers and programmers may be fraught with extra development time, hindering efficient deployment of AI/ML models.

Intel provides both hardware and software solutions for companies to use in building and deploying their AI and ML models. AI/ML workloads demand high power and infrastructure costs, inhibiting organizations from optimizing costs and speeding up inferencing. Intel provides AI chips and optimized solutions to scale and unlock AI insights. Intel AI helps data scientists develop models optimized for Intel chips faster and more efficiently. Because of this, software developers and programmers can import models straight from the data science teams, avoiding code redevelopment to port models across various environments and accelerating the AI/ML lifecycle.

Intel commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential benefits enterprises may realize by deploying Intel AI. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Intel AI on their organizations.

Intel AI accelerates AI/ML initiatives by helping avoid code redevelopment to port models across various environments.

Development time savings with OpenVINO

$2,150,353

To better understand the benefits, costs, and risks associated with Intel AI, Intel commissioned Forrester Consulting to interview seven customers with experience using Intel AI chips and software for their AI/ML inferencing workloads.

This spotlight of the full Total Economic Impact™ study will focus on software developer and programmer efficiencies. Please read the full study for more detailed information.

CUSTOMER JOURNEY

Interviewees came from a variety of previous legacy environments from a reliance on cloud service providers (CSPs) to running graphics processing units (GPUs) across training and inferencing workloads. Interviewees struggled with latency, performance, and cost limitations when trying to use GPUs for inferencing workloads. A professional services organization that was modernizing their data analytics by offering robotic and intelligent automation found success training models in the cloud. However, the organization required a model optimizer solution that could convert those training

models to the required hardware format, especially across edge and internet of things (IoT) devices.

Customers required a cost-effective solution that could support their AI/ML initiatives of improving inferencing speed, latency, and flexibility to run inferencing workloads across various infrastructure from data centers to the cloud to the edge. At the same time, customers required toolkits to save data scientist and software development time by accelerating development and deployment.

KEY FEATURES

Ultimately, interviewees noted several reasons for investing in Intel AI chips, including:

- **Deploying models without recoding**. Intel's OpenVINO software enables data science teams or their developer counterparts to generate models for specific Intel chips based on the application requirements such as size, power consumption, and heat dissipation. Using OpenVINO, AI teams can specify a target chip and OpenVINO will generate the model instead of requiring model redevelopment.
- **Ecosystem and breadth of portfolio.** Intel's chipset covers the breadth of infrastructures and AI use cases for companies, making it simpler to deploy across ecosystems. This is especially important when considering interoperability and compatibility of AI/ML workloads across a company's IT infrastructure (e.g., from edge to core).
- **Ability to optimize the most important metric.** Intel's variety of processor chips including CPUs and field-programmable gate arrays (FPGAs) afforded them the ability to balance data size, latency, and overall performance.
- **The extension of existing infrastructure.** Interviewees noted that investing in Intel AI allows them to scale their AI/ML usage by extending existing infrastructure and edge devices rather than purchasing new point-solutions and hardware. One interviewee noted that upgrading existing CPUs is much easier and cheaper than building GPUs.

> **"OpenVINO models allowed us to reduce our development time by at least four times."**
>
> *Chief technology advisor, technology industry*

KEY RESULTS

Based on the customer interviews and TEI analysis, Forrester found the following risk-adjusted present value (PV) benefits from using Intel AI:

Development time savings with OpenVINO totaling more than $2.1 million. Interviewees noted that their organizations' data scientists used Intel's OpenVINO toolkit to deploy their inferencing models to Intel AI chips, optimize Pytorch Models, and save development time. As a consequence, software developers are freed from having to optimize models for deployment themselves, saving time for other productive tasks and accelerating model deployment time.

Customers reported that their organizations used Intel's pre-trained deep learning encoders, and one customer gave the example that their organization used OpenVINO's eyeglass detection module instead of building that from scratch. This significantly reduced coding and deployment time for their inference models.

READ THE FULL STUDY HERE

Modeling and assumptions. Based on the customer interviews, Forrester modeled the financial impact for the composite organization with the following estimates:

- The composite employs 15 data scientists in Year 1, growing to 30 data scientists in Year 3.
- Each data scientist develops five AI/ML models per year.
- Before OpenVINO, each AI/ML model took 160 hours to develop the inferencing model to be deployed to an Intel AI chip.
- With OpenVINO, this time is reduced to 40 hours.
- Data scientists have an hourly-equivalent fully burdened salary of $85.

Risks. This benefit can vary due to uncertainty related to:

- The number of data scientists.
- The number of models each data scientist can develop.
- The time saved by using OpenVINO.
- Data scientist salary.

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not quantified include:

- **Improved inference performance.** Customers noted that Intel AI chips improved inference performance compared to alternatives. With this solution, inferencing workloads ran quickly. Additionally, edge devices allowed inferencing to run locally on the device as opposed to sending the data to the cloud and back, saving more time.
- **Less power required for FPGAs vs. GPUs.** Customers also noted that edge workloads required special considerations, all of which Intel AI chips addressed, noting that FPGA chips are a much more power-considerate device. Intel AI provides size/weight/power considerations, the ability to power the chip and edge device from a battery, and heat generation considerations.
- **Software adoption.** Customers noted that the simple developer interface for OpenVINO and other software associated with Intel AI chips was key in driving adoption for their company and data scientists.

Development Time Savings With OpenVINO

Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Number of data scientists	Composite	15	20	30
A2	Number of AI/ML models developed per data scientist (per year)	Composite	5	5	5
A3	Average development time per model before OpenVINO (hours)	Interviews	160	160	160
A4	Average development time per model with OpenVINO (hours)	Interviews	40	40	40
A5	Average data scientist fully burdened salary (hourly)	Composite	$85	$85	$85
At	Development time savings with OpenVINO	A1*A2*(A3-A4)*A5	$765,000	$1,020,000	$1,530,000
	Risk adjustment	↓20%			
Atr	Development time savings with OpenVINO (risk-adjusted)		$612,000	$816,000	$1,224,000
	Three-year total: $2,652,000		**Three-year present value: $2,150,353**		

TOTAL ECONOMIC IMPACT ANALYSIS

For more information, download the full study: "The Total Economic Impact™ Of Intel AI," a commissioned study conducted by Forrester Consulting on behalf of Intel, June 2021.

STUDY FINDINGS

Forrester interviewed seven organizations with experience using Intel AI and combined the results into a three-year composite organization financial analysis. Risk-adjusted present value (PV) quantified benefits include:

- Development time savings with OpenVINO of **$2,150,353**.
- Inferencing flexibility and interoperability efficiencies totaling **$1,142,375**.
- Hardware savings totaling **$1,623,155**.

Appendix A: Endnotes

[1] Source: "Introducing ModelOps To Operationalize AI," Forrester Research, Inc., August 13, 2020.

DISCLOSURES

The reader should be aware of the following:

- The study is commissioned by Intel and delivered by Forrester Consulting. It is not meant to be a competitive analysis.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Intel AI.
- Intel reviewed and provided feedback to Forrester. Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning.
- Intel provided the customer names for the interviews but did not participate in the interviews.

ABOUT TEI

Total Economic Impact™ (TEI) is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders. The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility.

© Forrester Research, Inc. All rights reserved. Forrester is a registered trademark of Forrester Research, Inc.


FORRESTER®