

Intel and AWS Enable Implementation of English Skill Development Program in Government Schools

EnglishHelper delivers the RightToRead program, built on Intel infrastructure on Amazon Web Services (AWS), across government-run schools to improve English literacy and create better learning outcomes.

“The RightToRead program addresses a fundamental need for access to English education, which is missing in public schools. Amazon Web Services and Intel came together to enable scalability and deliver a cost-effective solution that will reach thousands of students across government schools.”

—Rahul Sharma

President, World Wide Public Sector, India and South Asia, Amazon Internet Services Pvt. Ltd.



Executive Summary

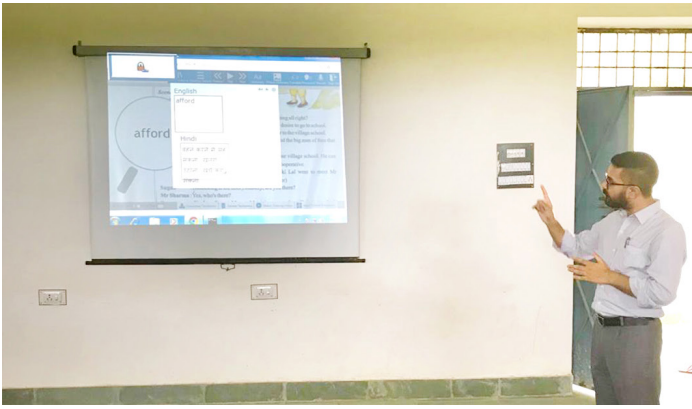
English proficiency in developing economies like India affects the economic and social well-being of people. This issue adds considerable value to the social significance English proficiency holds. Most government-run schools in India use the local language as the medium of education and English language learning and proficiency is often challenging for the students. EnglishHelper (EH), a language learning technology company and social enterprise¹, realized the criticality of this challenge. They partnered with Schoolnet India Ltd, an education and skilling organization, to find a long-term solution. Built on the premise that language is best learned in a multi-sensory environment², ReadToMe[®], an AI software equipped with text-to-speech voice technology for multi-sensory reading and comprehension, was developed. Partnering with Intel and Amazon Web Services (AWS), EH was able to achieve scalability and provide the software to government-run schools across all states in India, which is now supporting the students of more than 25,000 schools and expected to grow to beyond 100,000 schools in 2021-22.³

Implementing Technology-based Learning

Surveys conducted over the past decade across government schools in India show a significant gap in reading and comprehension ability of students.⁴ A majority of government schools in India, especially in rural areas, use the local vernacular or state's official language as the medium of education. According to the 8th All India Educational Surveys (AIES), English as a medium of instruction was used only in 15.49% schools at the primary stage, 21.08% schools at the upper primary stage, 28.73% schools at the secondary stage and 33.06% schools at the higher secondary stage.⁵ Learning English for students of government schools is difficult for a variety of reasons – English phonics are arbitrary and challenging for students who are not exposed to English in their daily lives. Also, there are issues caused by teacher shortages and teachers' English proficiency.

Acquiring English language skills opens opportunities for students in India by providing a wide range of higher education and employment options in the future. EnglishHelper (EH), recognized the implications the absence of English language skills had on the future of these students. To help students overcome this hurdle, EH created a long-term solution in the form of ReadToMe[®], an AI software that facilitates multi-sensory reading and comprehension.

To ensure a wider reach, EH launched the RightToRead program that implements ReadToMe[®] in various learning environments to support the learning needs of students.³ They approached several states within India to explore the possibilities this solution could open up for the students of government-run schools, especially in rural areas. This enabled EH to work with the governments across the country and deploy the RightToRead program in more than 25,000 schools impacting the lives of over 10M students and 100,000 teachers.³



Classroom reading for better comprehension.³



Platform to Develop English Language Skills

EH—in association with Schoolnet, Intel, and AWS—has successfully implemented its ReadToMe[®] software in digitally equipped government schools across multiple states. The software implemented in the RightToRead program is equipped with AI enabled multi-sensory technology that makes learning interactive for the students and enhances teacher effectiveness. Implemented for students from grades 1 through 12, EH found that students undertaking ReadToMe[®]-enabled classes showed 20–40% higher improvement in reading and comprehension, as measured by independent evaluations by third parties.³ This significant result is made possible by consistent exposure that enables students to learn English phonics and improve word recognition. Additionally, adapting it with the curriculum ensures practical implementation of the prescribed textbooks and eliminates the need for extended classroom sessions. Today, ReadToMe[®] empowers more than 10M students in over 25,000 schools³ by providing them with a wholesome learning experience in the classroom and beyond.

The most recent state to implement the RightToRead program is

Andhra Pradesh. As an initiative to include English as the medium of education in all government schools, the state along with EH introduced the Anglodayam project, which extends the RightToRead program solutions in residential schools of the state's tribal and social welfare departments.⁶ Together with Intel and AWS, EH successfully deployed the program in 210 schools. More than 40,000 students and 300 teachers in remote parts of Andhra Pradesh use the program.

Solutions that Transform Language Learning

The vision to create an impact propelled EH to find multiple solutions that could be included in the RightToRead program that assist not just the students, but also aid the teachers. As the program was intended for government-run schools, especially in rural regions, EH realized that most teachers were not completely equipped with grade-appropriate language proficiency. To enable teachers with the right skills, EH provided the teachers with a learning solution, EnglishBolo[™], which is assigned based on their English proficiency. Through EnglishBolo[™], teachers are enabled to improve proficiency and increase familiarity with the ReadToMe[®] solutions. A blend of self-learning and live tutoring sessions provide the teachers with a safe learning and practice environment. EnglishBolo[™] is undoubtedly of immense value to teachers, but in implementing the program EH has demonstrated that nearly 60% of teachers are below desired level of English proficiency. This gap has to be closed quickly if the state government wants to successfully transition to English as the medium of education.

Teachers completing the EnglishBolo[™] program are equipped with the knowledge necessary to implement the ReadToMe[®] School Edition and ReadToMe[®] Virtual Classroom. These solutions assist students from grades 1 through 12 to learn curriculum-based English lessons both in a classroom environment and remotely. ReadToMe[®] School Edition leverages the school's information and communication technology (ICT) infrastructure to provide a multi-sensory learning experience using visual and auditory aids, which are controlled by the teacher. This maximizes student participation and involvement in the lessons. ReadToMe[®] Virtual Classroom enables teachers to continue remote, online teaching of English, without hampering lesson plans. To augment classroom learning for students, EH implemented the ReadToMe[®] Student Edition that provides students with the required academic support outside school. A self-learning app, it can be installed on Android devices, enabling students to read and comprehend school curriculum textbooks.



EnglishBolo[™] session for teachers to aid with better training tools.⁶

Harnessing Intel’s Advanced AI Capabilities

EH leveraged the AWS Elastic Compute Cloud (EC2) M5 instances powered by 2nd Generation Intel® Xeon® Scalable processors. Intel processors and architecture employed to support the AWS application servers and databases helped improve compute times and ensured optimization of the applications.

Intel architecture delivers strong data protection, fast processing of large data volumes, and service flexibility without any performance drawbacks. Intel® Xeon® Scalable processors provided the RightToRead program with key capabilities necessary, which include:

- **Intel® Deep Learning Boost (Intel® DL Boost):** Along with improved performance on image classification in 2nd Generation Intel® Xeon® Scalable processors, Intel® DL Boost also offers built-in AI acceleration with fast deep learning inference performance.
- **Intel® Advanced Vector Extension 512 (Intel® AVX-512):** The Intel® AVX-512 extension offers accelerated application performance, enabling significant improvements in workload speeds and data applications.

“The ability to read, write, and speak English can open a multitude of opportunities for children. By partnering with AWS and helping scale EnglishHelper’s RightToRead program, we were able to make a significant impact on learning outcomes and hope to continue this brilliant collaboration across other states in India.”

—Peter Bevan
Global Director – CEGS Team Amazon

Harness AWS Instances for Scalability & Optimization

Amazon EC2 M5 instances, with the computational power of 2nd Generation Intel® Xeon® Scalable processors and Intel® AVX-512

and Intel® DL Boost, enabled EH to seamlessly deploy the AI-based RightToRead program across schools in urban & rural parts of India. The Relational Database Service (RDS) that AWS provides, in addition to Intel® Performance Libraries, helps with setup, operation, and scaling of the database used for the application. The Intel® AVX-512 extension along with AWS content delivery networks (CDNs) greatly enhance the performance of EH’s machine learning algorithms and improve application availability and performance.

To help with the storage and accessibility of course materials, Amazon Simple Storage Service (Amazon S3) on Intel architecture is used, which ensures easy organization and management of data. The Intel® AVX-512 extension also enhances compute intensive operations using AWS Lambda to train ReadToMe® to read textbooks properly. Additionally, AWS services such as CloudWatch for real-time alerts, CloudWatch Logs for logs analysis and application, and GuardDuty for security and unauthorized access are also implemented for this program.

With 2nd Generation Intel® Xeon® Scalable processors, the EC2 instances improve the ability to scale by providing the necessary computation power. This has now enabled EH to extend the program to several thousands of schools simultaneously. The scalability also ensures that several millions of students and teachers in various learning environments are enabled to efficiently learn the English language.

“The RightToRead program gives us the opportunity to focus on enabling English literacy and proficiency among the under-served populations of India (and globally). Intel and AWS provided the scalability and adaptability through the cloud to extend the program to the remotest parts of India and make a difference for both students and teachers.”

—Sanjay Gupta
Global CEO – EnglishHelper

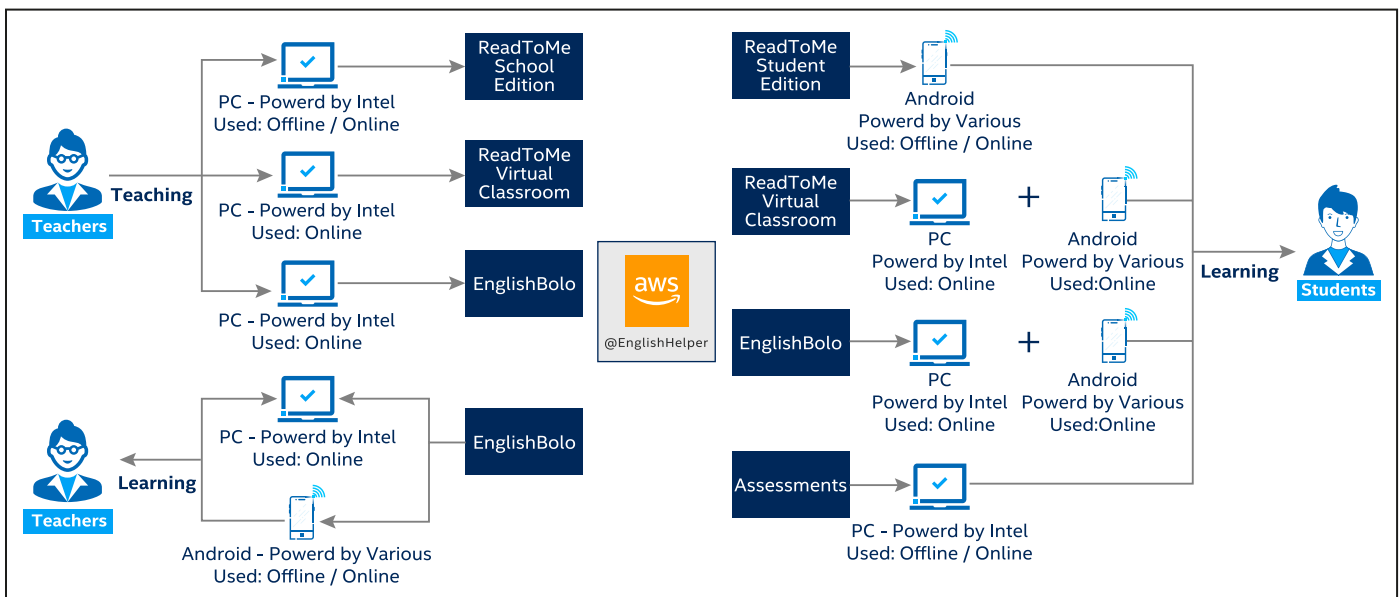


Figure 1: AWS-Intel Usage in Learning Solutions.³

Seamless Deployment Using AWS and Intel

One of the major challenges that EH faced was deploying the software to multiple schools simultaneously. Sriram Shankar, CTO at EH, states, “during the early stages of the program we physically deployed the software to schools using CDs, which took a long time to install and set up. Working with Intel and AWS, we could migrate the solutions to an AWS cloud from our on-premises data center ensuring that our deployments are highly efficient.”

Intel architecture and AWS cloud helped provide scalable computing capacity while keeping costs low and delivering advanced features that enhance the learning experience. With automated deployment, QA solutions, and stateless servers—made possible using Amazon EC2 M5 instances based on Intel® Xeon® Scalable processors—EH was able to bring down deployment times from 4 hours to 30 minutes and planned downtimes for every release from 4 hours to a few minutes. Moving to the cloud also ensured that the installation and registration of the software could be done under 30 minutes.⁷

Another challenge that EH faced was providing effective operational support for all the schools that were using the program, especially in remote locations. The need to physically visit each school and limited information provided about the functioning of the software

meant increased operational costs and a larger team size. Working with Intel powered AWS instances and cloud helped EH to manage the infrastructure with a team of just 2 personnel while significantly lowering their capital expenses. With most routine tasks like provisioning of servers, scaling in response to demand, and healing being managed by Intel and AWS, EH could focus on improving their infrastructure and solving for real customer issues.

Creating a Better Future with English

With the program offered by EH, students are enabled with the ability to speak and write English. Opportunities to study further and be eligible for desired jobs are a direct result of this program that further improves the incomes of rural households of India. The association with Intel and AWS helps EH provide this transformative skill to more students each year. The capabilities and impact highlighted by the results is inspiring other states to implement the program.

Utilizing Intel architecture and AWS technology, EH can now achieve uninterrupted scalability in the near future and implement their solutions in more than 100,000 schools across all states in India. This solution will effectively help EH make a lasting impact on the lives of over 20M students and 500,000 teachers³, enabling them with improved learning abilities and promoting continual growth and progress.



Teachers and Students Using the ReadToMe® School Edition.⁶

Where to Get More Information

Find the solution that’s just right for your organization. Contact your representative or visit intel.com



¹Source: <https://www.englishhelper.com/dashboard/about-us#overview>

²Source: <https://www.sciencedirect.com/science/article/pii/S2666920X21000138>

³Source: Document – EnglishHelper Overview

⁴Sources: https://img.asercentre.org/docs/Publications/ASER%20Reports/ASER%202016/aser2016_nationalpressrelease.pdf and https://ncert.nic.in/del/pdf/English_Primary_level.pdf

⁵Source: - All India Educational Surveys (AIES), https://ncert.nic.in/pdf/programmes/AISES/8th_AISES_Concise_Report.pdf

⁶Source: Document - Anglodayam Project - AP - Project Progress Report - May 2021

⁷Source: Performance results provided by “EnglishHelper”.

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