



The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

Status:

Laureate

Year:

2013

Organization Name:

HP

Organization URL:

www.hp.com

Project Name:

HP VideoBook

Please select the category in which you are submitting your entry:

Innovation

Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less.)

There is a large market (especially in developing countries) that is underserved by current methods of education delivery. Delivery of quality education has been deterred by the costs of physical infrastructure (both capex and opex) and lack of trained teachers. This has made it difficult for many emerging economies to make education reachable to every citizen. Many countries (e.g. NCERT in India and Tamil Nadu state education board) have produced and made digital textbooks for schools free. Worldwide, textbooks are predicted to go from 3% today to 25% in 2015. A large number of excellent videos on different educational topics are being produced by many individuals (e.g. Khan Academy), educational institutions (e.g. MIT courseware) and commercial companies. The videos

include lectures, animations, demonstrations and experiments. The rapidly growing availability of textbooks in digital form and video content providers enables the possibility of creating a cloud-based textbook experience that is much richer than the static, text oriented experience it is today. VideoBook is an HP solution that augments the textbook experience with videos. The VideoBook algorithm first processes the textbook chapter (or any input document) and extracts a sequenced list of the most important concepts covered in the chapter/document. The algorithm next sequences the topics in the order in which they appear on each page of the book. Next, a video source (e.g. open source such as YouTube or content partners website) is queried to source the videos relevant to each page of the book. The results are ranked using a video selection algorithm that takes into account diversity and relevance of the videos and the coverage of the book topics. Finally, the book page and videos are presented side by side. This in turn allows students a personalized learning experience based on learning progress.

When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less.)

HP VideoBook was first piloted January - April 2012. The pilot -- in two schools in India -- tested a combined learning experience for students in algebra: VideoBook alongside Mindspark, an adaptive learning tool created by Educational Initiatives pct (India). Since then the VideoBook algorithms that map and identify videos have been further refined and tested in multiple contexts. In addition, the VideoBook user interface has been expanded to include additional apps by HP Labs to enhance the learning experience including additional search engines and auto-generations of PowerPoints that enable students to better consume vast and often dense amounts of information by first understanding the framework of what is being presented as content.

Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)

The implementation of the project is complete and the solution has been productized by HP and launched as a cloud hosted solution as well as a client-server solution. The cloud version of the solution is currently hosted on the HP Cloud and the initial use case is targeted at improving textbook-based education. Students can log in to the system from a browser and access videos relevant to each page of the textbook chapter. The software is implemented using J2EE technologies. A client server version (aimed at enterprises) has been developed targeted for employee training and onboarding. This is architected as plug-ins to Microsoft Word and Adobe Acrobat. In the coming year we plan to incorporate

new features including technologies for automatic slide generation from textbooks, video question answering (where students' questions are answered with videos) and assessment technologies (to create questions for the textbook chapters and present them to the student for assessment). We plan to develop new personalization algorithms that re-rank videos based on user click-throughs and assess the grade to which the video is best suited. We also plan to scale the cloud version of the product to handle a large user base.

Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)

Two schools (Gurajat and Karnataka, India) with very different demographics were provided access to the solution for a period of three months. In both cases, the students who used the solution showed a significant improvement in academic performance compared to those who did not. The improvement was in the range of 8-12 percentage points, or 20% to 30% in relative terms. Another key impact of the solution was that it engaged the weaker students very effectively and improved their performance significantly. By giving the students new venues to learn the concepts the solution offered the option to explore concepts at their convenience and learn in their own way. Teachers and students were enthusiastic about the difference the solution made in the way concepts were taught and in the way teachers' time was freed for personalized engagement with individual students. When asked for feedback, one of the students said, "I liked Learning My Way because everyone is interested in learning digitally. I really liked the videos as it made my concept clearer. According to my opinion this is the best way of teaching and I hope I will get to do this in Standard 9 also. Thank you."

Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)

This project is considered a technological innovation. Although a number of companies are providing solutions in the education space, a solution that combines the textbook experience with online video experience by sourcing videos dynamically is novel. We would like to point out that the technology will work with any kind of text document (magazines, research papers, etc.) and has a broader applicability than just textbooks. The advantages of the HP VideoBook solutions are: better engagement with textbook material; multiple ways of understanding textbook concepts from different content providers; easy



integration with assessment solutions or educational networks; always on 24x7 content delivery; and improved learning outcomes.