



The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

Status:

Laureate

Year:

2013

Organization Name:

Millenniata, Inc.

Organization URL:

www.millenniata.com

Project Name:

Permanent digital data storage

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

World Good

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.)

Preserving our history and culture depends on being able to create artifacts that can persist over time. Since computers were invented, digital data storage has been ephemeral and even today's storage media only store data for 1-2 decades. Most data today is digital only, and many cultural artifacts are "born digital". It is urgent that solutions for permanent digital data storage be developed, and that our society be educated to adopt these storage solutions. Otherwise we face a "digital dark age" or "digital crisis" in which future historians will have no artifacts to study. The research proposed herein will benefit world society by providing a solution to this problem.

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.)

January 2010, when the M-Disc became widely available, would be the first date. Since then a Blu-ray version of the disc has been developed and will be manufactured in Q2 2013. Additionally, a 2-layer, 2-sided Blu-ray version is under development and should be available by Q4 2013. Further research is presently underway to create a solid-state permanent storage option and an optical tape permanent storage option. This research is preliminary, but has shown great promise. Papers have already been presented on this research at storage conferences. It is anticipated that these technologies will be available within 2-3 years. Lifetime expectancy tests have been performed on the M-Disc, by independent agencies and in our own research, and it looks like 1,000 years can easily be the lifetime of these discs. And because the optical disc data storage format is the most widely adopted digital data storage format in the history of the world, our knowledge and ability to read these discs should easily persist for centuries, much as we can read Latin today, but only if the digital data persists.

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.)

Phase 1 (development of the M-Disc) is complete. Phase 2 is development of the BD version of the disc, and that phase is nearly complete and is being announced at CES 2013 in Las Vegas. Phase 3 is development of a 2-layer, 2-sided BD version (100 GB); that phase is estimated to be completed by Q3 2013. Phase 4 is development of a 4-layer, 2-sided BD version (200 GB); that phase is underway and should be completed by mid-2014. Phase 5 is a permanent solid-state storage solution, and should reach lab feasibility by 2015. Phase 6 is a permanent optical tape storage solution, and should reach lab feasibility by 2016.

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.)

The Harold B. Lee Library at Brigham Young University presently archives about 40 TB of essential data on archival-quality optical discs. These discs are dying at a rate of about 2% per year, even though they are stored in controlled conditions of temperature, humidity and light, and are not circulated outside the library. Replacing this collection of optical discs with M-Discs has enabled them to stop monitoring their collection every year and replacing the bad discs, which is a very labor-intensive undertaking. M-Discs do not need to be kept in controlled conditions of temperature, humidity, or light, so storing the data on them is like storing a book – just put it on the shelf and forget about it. It will be there, intact, in a couple of centuries.



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 is very innovative. There are no other companies focused exclusively on permanent digital data storage. No other optical discs can even come close to surviving the conditions that the M-Disc can survive (see www.mdisc.com/2011/03/02/china-lake-summary-report/). It is an entirely new approach to permanent digital data storage, and has been shown to be very effective. It should be adopted by any organization or individual that wishes to reduce their costs for long-term archival of digital data, and to preserve the data indefinitely.

If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)

An Internet search of the terms "digital dark age" or "digital crisis" will turn up several excellent articles on the significance of this problem. This technology provides the first link to a complete solution for this problem.