



Market Analysis Report "Optical Disc Archive 2015"

「Optical Disc Archive 2015」

English Digest Version

Fujiwara-Rothchild, Ltd.

Fujiwara-Rothchild, Ltd. will publish "Optical Disc Archive 2015" on July 20, 2015, as the 4th market research report of optical disc archive.

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1 Brief Summary

The supply capacity of Cold Storage rapidly increased in 2014.

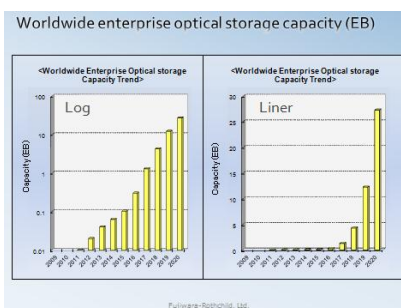
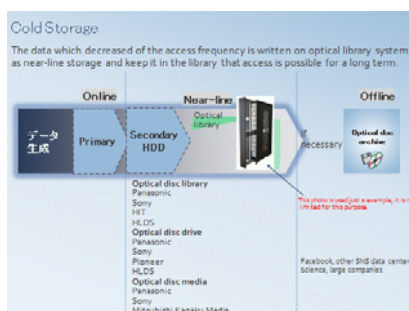
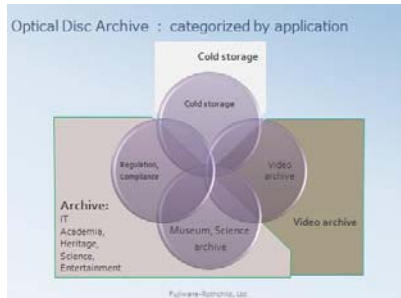
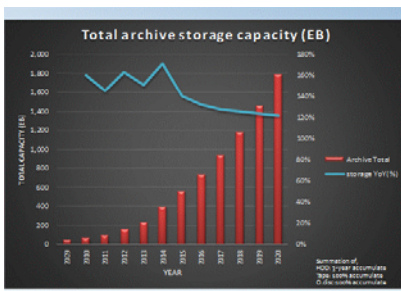
1. The expansion trend of cold storage capacity such as HDD and LTO has become clear in 2014 and reduction of LTO in quantity has stopped. The demand for cold storage which is important for penetration of optical disc archive is rapidly becoming strong.
2. Facebook is scheduled to set up pilot plant using 100GB Blu-ray disc in 2015, initially scheduled in 2014.
3. Small- to mid-sized optical disc archive is steady, but the efforts of each maker has not brought a great change yet. More effort for enlightenment of optical disc archive is necessary.
4. Application of optical disc archive for video archive is favorably increasing.

In this report, the latest trend is organized including background of 1) ~ 4) and each company trend.

2 Index (major items only)

1. Executive Summary
2. Business model and business approach of optical disc archive
3. Technology trend and market trend of cold storage (HDD and LTO)
4. The market approach and trend of the companies related to optical disc archive
5. Understanding of optical disc storage in a large-scale data center
6. Business perspective related to the optical disc storage system of Facebook
7. The impact that Facebook announcement gave to the market
8. The forecast of optical disc storage penetration

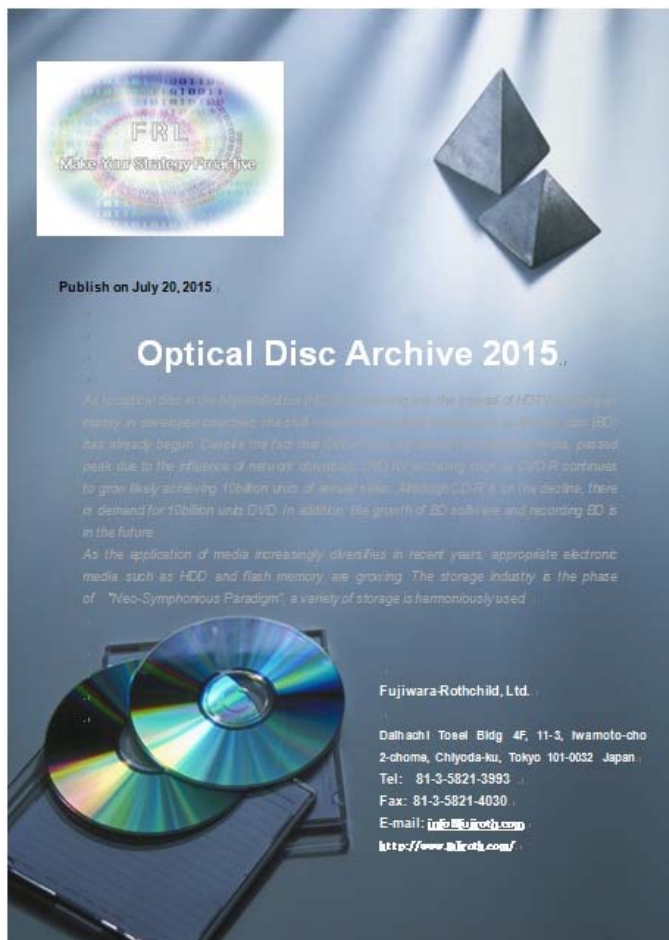
3 Abstract



1. About 80% of created data reduces its access frequency in a short period. To store the data with reduced access frequency in the storage which needs huge energy consumption and frequent failure conflicts with environmental protection, and it is inevitable to switch to the storage which is able to store the data with no power consumption.
2. Regarding the actual storage capacity for archive (for cold storage application) will continue rapid increase, HDD for near-line 257EB and 1110 EB will be respectively in 2014 and 2020, LTO for near-line 137EB and 650EB, totally become 1,800EB including optical disc archive in 2020.
3. Considering present situation and the progress in the future, the categories of optical disc storage application in the enterprise market are as follows:
 - ① Cold storage application (such as large-scale users, and data center)
 - ② Archive application (such as enterprise IT, academia, heritage, science, entertainment)
 - ③ Video archive (such as post production, broadcaster)

In this report, optical archive market is classified as ①—③ and analyzed by common term of business approach, equipment design, alliance partner of software and system integration and business mode. As a result, each business model and trend in the future are analyzed.

4. Further expansion of optical disc archive in the future depends on the success of optical disc archive in the Cold storage of Facebook. The impact of delay of introduction of optical disc archive pilot plant system in Facebook is not small, but still Facebook is scheduled to install the pilot plant of optical disc library system with 100GB Blu-ray disc again in 2015 and the library system that had been scheduled to be introduced in 2014 is likely to change. The analysis of the reason of the delay of the system is described.
5. HDD and LTO are trying to increase their capacity by improving recording density. HDD is in a slightly difficult situation, but the roadmap of LTO and technological innovation of HDD assume their evolution to respond the demand of capacity.
6. The capacity of the 12-disc cartridge will be 3.6TB in 2015, nearly HDD. The cost per bit of optical disc will achieve \$0.01/GB as of 100GB disc, nearly tape.
7. The optical archive library system for Facebook proposed by HIT -Storage Inc. is able to hold 10,000 optical discs in 19" rack of Open Compute standard, 1PB-capacity using 100GB disc. On the other hand, Sony showcased prototype of 1.5 PB with larger rack at Open Compute Project Summit (OCP) in March, 2015.
8. The data capacity supplied by optical disc archive will surpass 1EB in 2017 and become approx. 20EB in 2020. Supply capacity for Cold storage will rapidly increase in 2017.



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As optical disc in the hybridization of CD and DVD is being used, the trend of HDD shipping in many in developed countries, the full hard drive market is expected to decline. (BD) has already begun. Despite the fact that DVD shipping is expected to reach a peak, passed peak due to the influence of network download (N) by recording device, DVD-R continues to grow likely achieving 10 billion units of annual sales. Although CD-R is on the decline, there is demand for 10 billion units DVD. In addition, the growth of BD software and recording BD is in the future.

As the application of media increasingly diversifies in recent years, appropriate electronic media such as HDD and flash memory are growing. The storage industry is the phase of "Neo-Symphonic Paradigm", a variety of storage is harmoniously used.

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