MASSIVE

IEEE – MASSIVE STORAGE SYSTEMS AND TECHNOLOGY

PANEL SESSION:
JUNE 3, 2014

MEDIA FOR LONG-TERM ARCHIVING: PANEL

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Hitachi Data Systems

IEEE computer society

- Where they **MAKE** the money

  "Wants to Archive and Preserve"

  – Heavy investment in making or acquiring data & content

  – Attempts to keep data forever

  – Finds value in reusing data

  – In some industries, the archive is part of the organization's assets

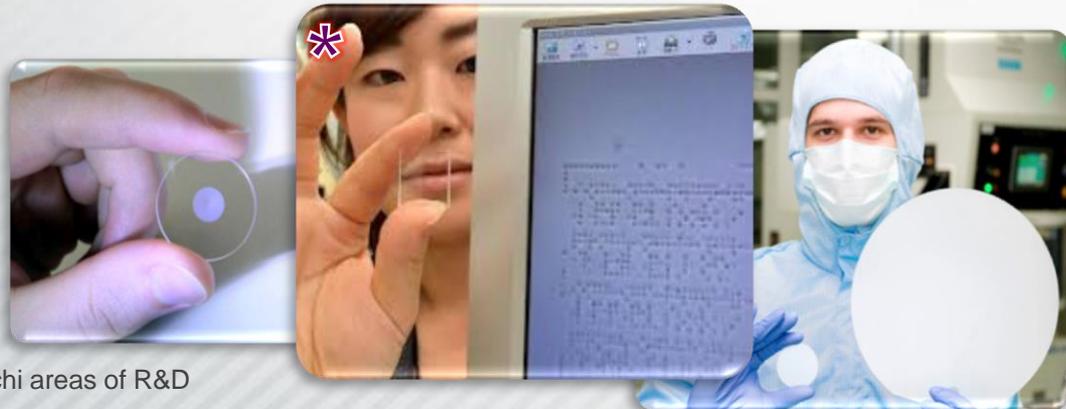 – True **WORM** required

- Where they **COUNT** the money

  "Has to Archive"

  – Must save data due to compliance or regulatory mandate in order to do business

  – Residual data, transactional artifacts

  – Looks forward to expiration dates and auto-deletion

  – Old data is a liability

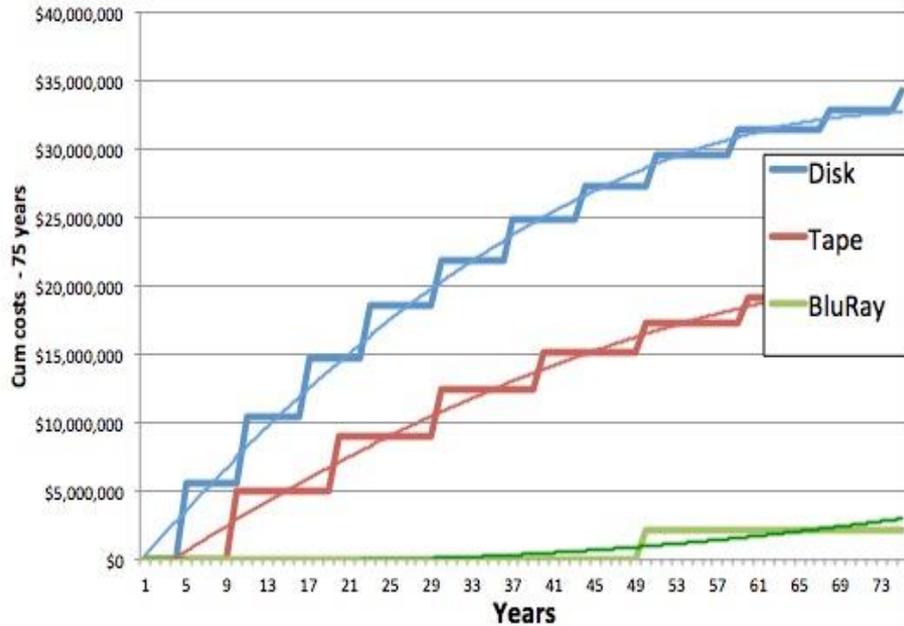 – Best effort, if that

  – **WORMED** actually required

■ All Optical-based Technologies

* – 50 – 100 Yr. BDXL Media, *(100 & 128 GB)**

* – Next Gen Blu-ray, *(300 – 1,000 GB)*

* – Holographic Storage, *(1 – 12 TB)*

* – M-Disc – 1,000 year media, *(Blu-ray)*

– DOTS – Digital Optical Technology System

– Sapphire Hard Disc – 1M yrs

– 5D Optical Nano-glass memory – 1M yrs
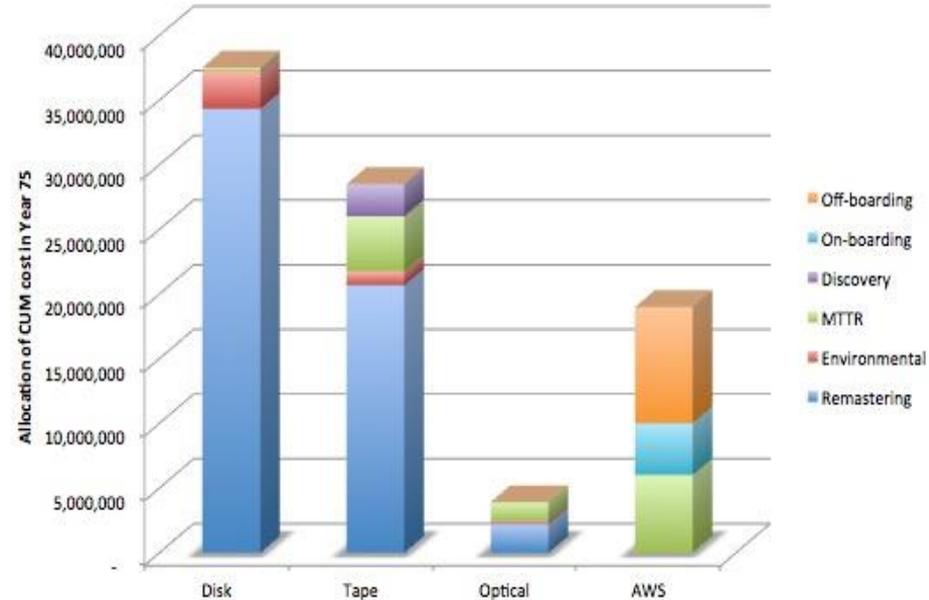
* – Quartz glass plate storage technology – 100M yrs

* Hitachi areas of R&D

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Migration/Remastering Costs of 5 PB — Cost of migration-event-erosion factored-in
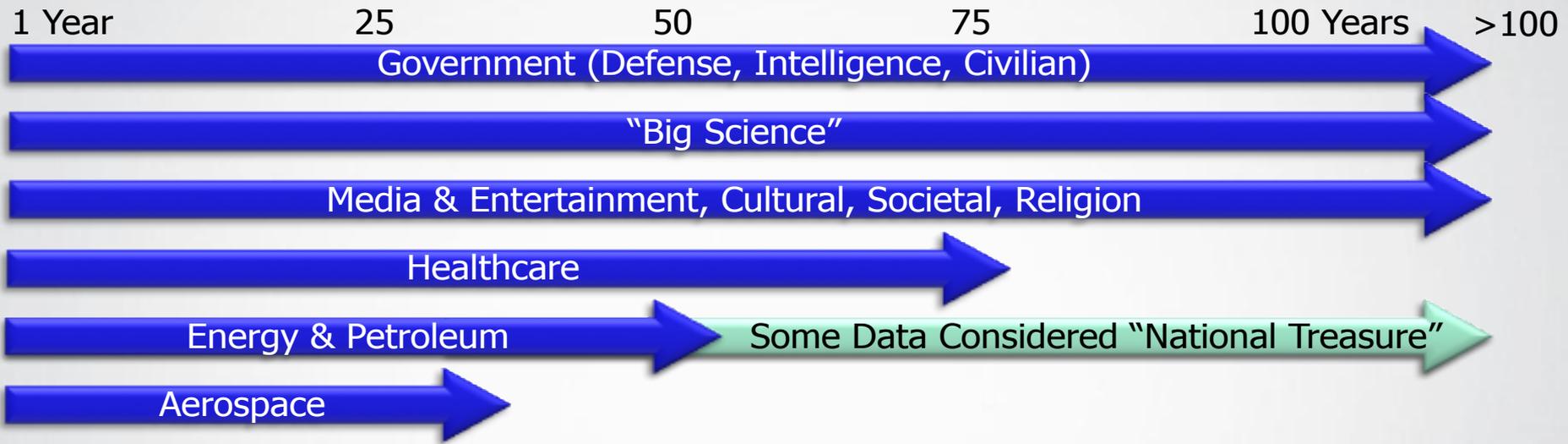

Breakdown of Costs for 5PB Stored for 75 years — Does not include media, capitalization, or subscription cost

- All analysis and charts by David Merrill
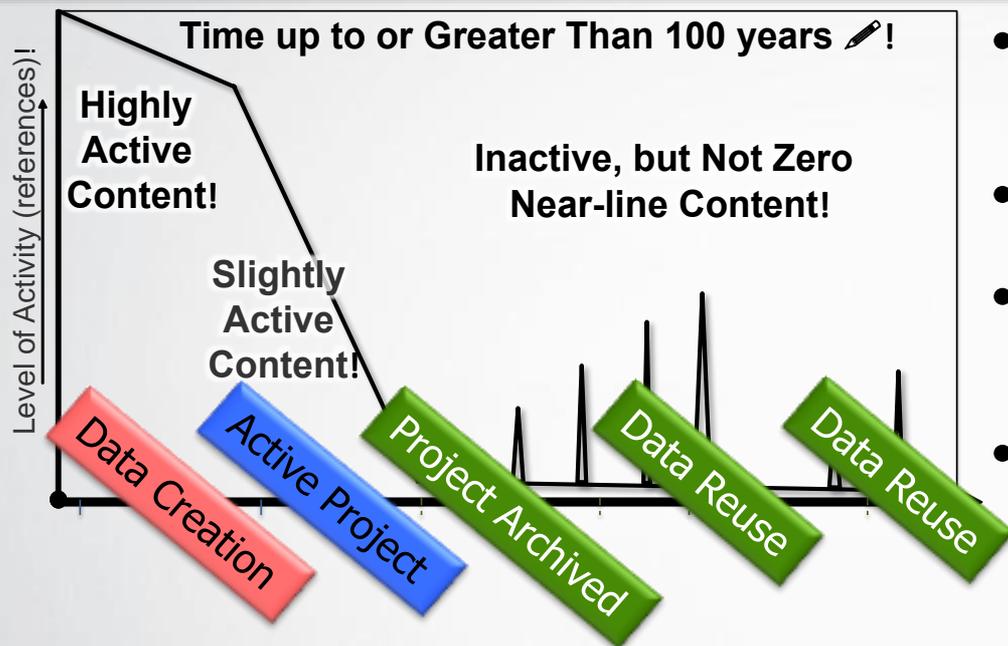- Data from industry partners & HDS teams

Costs for 75 years	Disk	Tape	Optical
Migration/Re-mastering	High	Moderate	Low
Power	High	Low	Low
Mean-time to restore	Low	High	High

4

1 Year	25	50	75	100 Years	>100

Government (Defense, Intelligence, Civilian)

"Big Science"

Media & Entertainment, Cultural, Societal, Religion

Healthcare

Energy & Petroleum — Some Data Considered "National Treasure"

Aerospace

- Terms used when talking with customers

  - Life of the patient plus 10 years

  - Life of the airframe plus 25 years

  - "Life of the company" …and beyond

  - "Life of the Republic"

  - Segment of time that spans multiple republics - Religion

Level of Activity (references)!

Time up to or Greater Than 100 years ✏!

Highly Active Content!

Inactive, but Not Zero Near-line Content!

Slightly Active Content!

Data Creation

Active Project

Project Archived

Data Reuse

Data Reuse

- Well known Data Life Cycle for Archiving Data

- Archived Data activity is not ZERO

- Historical Data Analytics needs access to archived data

- Data Reuse from the archive
  - Media & Entertainment reuse and re-issues movies in new formats, and as special edition / anniversary releases

Full Length Animated Movies

120TB - 2010   140TB - 2012   160TB - 2012   200TB - 2013*

Digital Live Active Capture

10PB - 2012

THANK YOU