



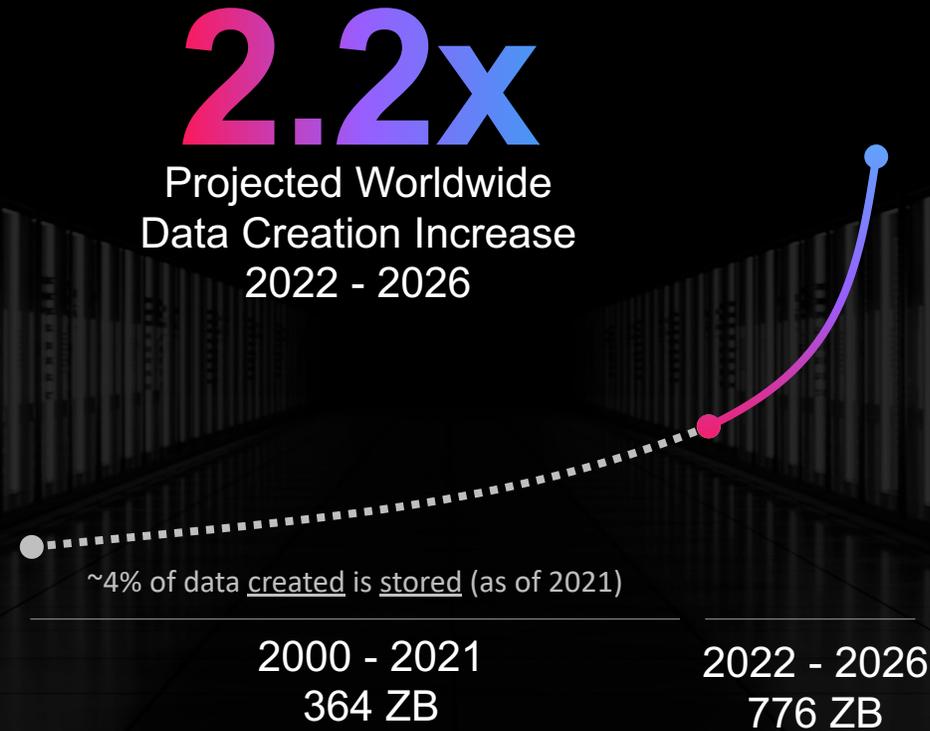
# Western Digital HDD BU

## Library of Congress

### Designing Storage Architecture Conference

# Data Creation Continues Unabated

## HDD Remains Key to Our Customers Delivering at Scale



**Invention of HDD**

1956



**2.5" PMR**

2006



**SMR**

2015



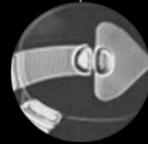
**Triple Stage Actuator**

2020



**UltraSMR**

2022



**MR Head**

1992



**Helium Drive**

2013



**ePMR**

2020

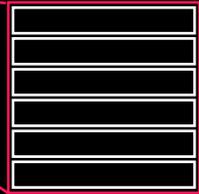
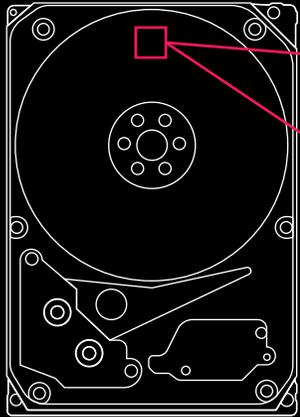


**OptiNAND**

2021

**Western Digital Has Defined the HDD Industry**

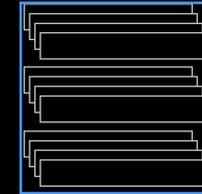
# WDC HDD Recording Schemes & Formats



**CMR**



**SMR**



**UltraSMR**

**PMR**

Perpendicular Magnetic Recording



**ePMR**

Energy-Assisted Perpendicular Magnetic Recording



**HAMR**

Heat-Assisted Magnetic Recording



# We Are Delivering on Our Promise

## Industry Capacity Leadership with 22TB & 26TB Drives



20TB

22TB

26TB

32TB+

CMR

**OptiNAND**

CAPACITY // PERFORMANCE // RESILIENCE

**SMR**  
CMR +10%

**UltraSMR**  
CMR +20%

**PMR**

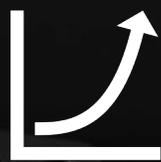
**ePMR**  
>1.1Tb/IN<sup>2</sup>

**ePMR 2**  
>1.3Tb/IN<sup>2</sup>

**HAMR**  
>2Tb/IN<sup>2</sup>

# Our Three Technology Pillars

Building the Future Innovation Framework



**ADC Leadership**



**Sustainability Focus**



**Innovations for  
Zettabyte Growth**

