

Supporting Change In Storage Strategies

FUJIFILM Recording Media U.S.A, Inc.
Peter Faulhaber - President



FUJIFILM Corporate Overview

\$21.5

Billion in Revenue

277

Subsidiary Companies

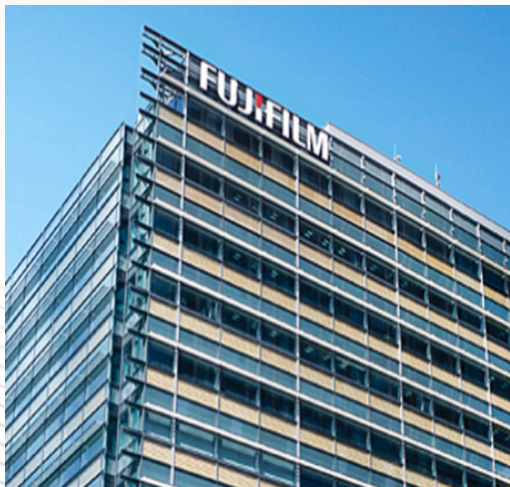
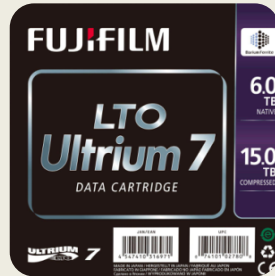
78,000

Employees Worldwide

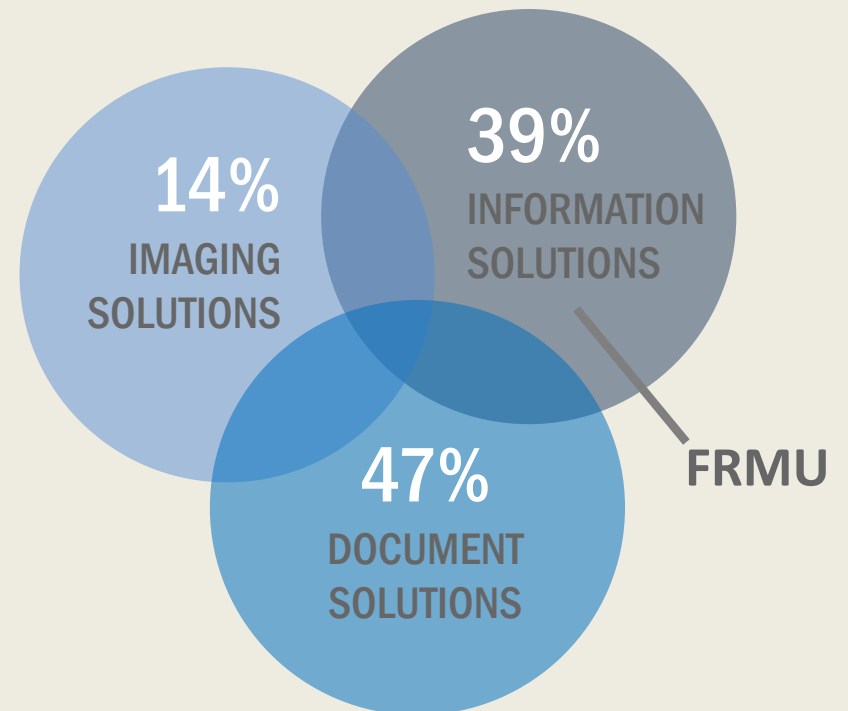
\$1.5B

R&D Spend

Not just “Film” anymore
World’s #1
manufacturer of LTO media



Barium Ferrite



FUJIFILM
Value from Innovation

Technology Changes

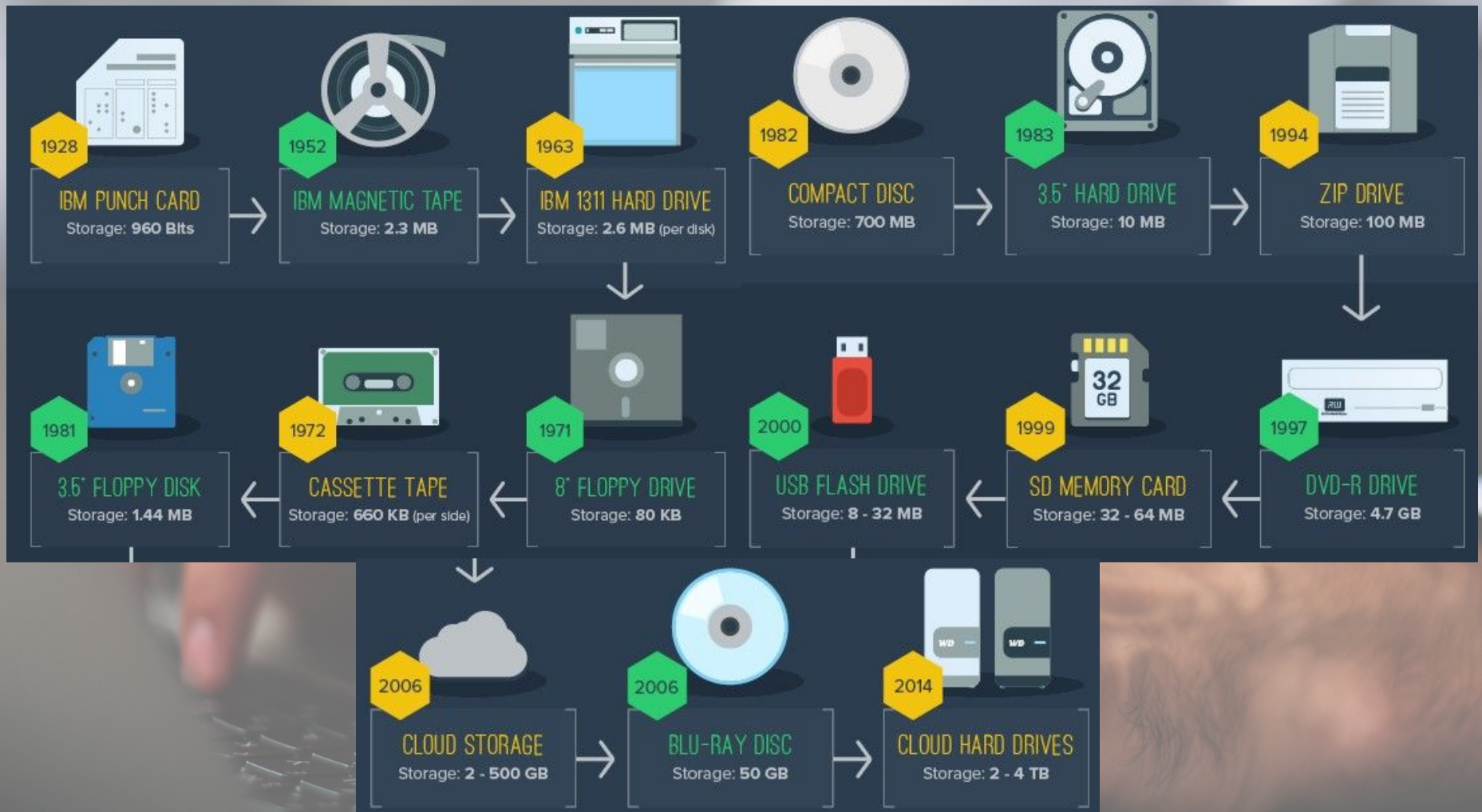


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Value from Innovation

Top 10 Global Technology Companies

1977		1997		2017	
IBM (US)	\$16.3	IBM (US)	\$81.6	Apple (US)	\$215.6
Burroughs (US)	\$2.1	HP (US)	\$47.0	Samsung (KR)	\$173.9
NCR (US)	\$1.9	Compaq (US)	\$31.2	Amazon.com (US)	\$135.9
Control Data (US)	\$1.86	NEC (JP)	\$30.5	Foxconn (TW)	\$135.1
Sperry Rand (US)	\$1.8	Fujitsu (JP)	\$27.9	HP (US)**	\$98.3
Digital Equipment (US)	\$1.4	Toshiba (JP)	\$26.9	Google (US)	\$90.2
Honeywell (US)	\$1.2	EDS (US)	\$16.9	Microsoft (US)	\$85.3
ICL (GB)	\$1.0	Microsoft (US)	\$14.5	Hitachi (JP)	\$84.5
Fujitsu (JP)	\$.886	Dell (US)	\$12.3	IBM (US)	\$79.9
HP (US)	\$.657	Sun (US)	\$9.8	Huawei (CN)	\$78.5
Total (\$B)	\$29	Total	\$298	Total	\$1,177

Storage Technology Changes



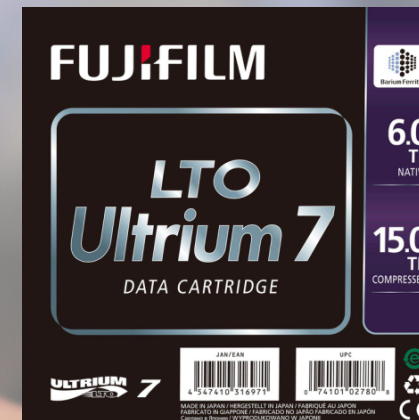
Tape Technology Has Changed Too!

1997



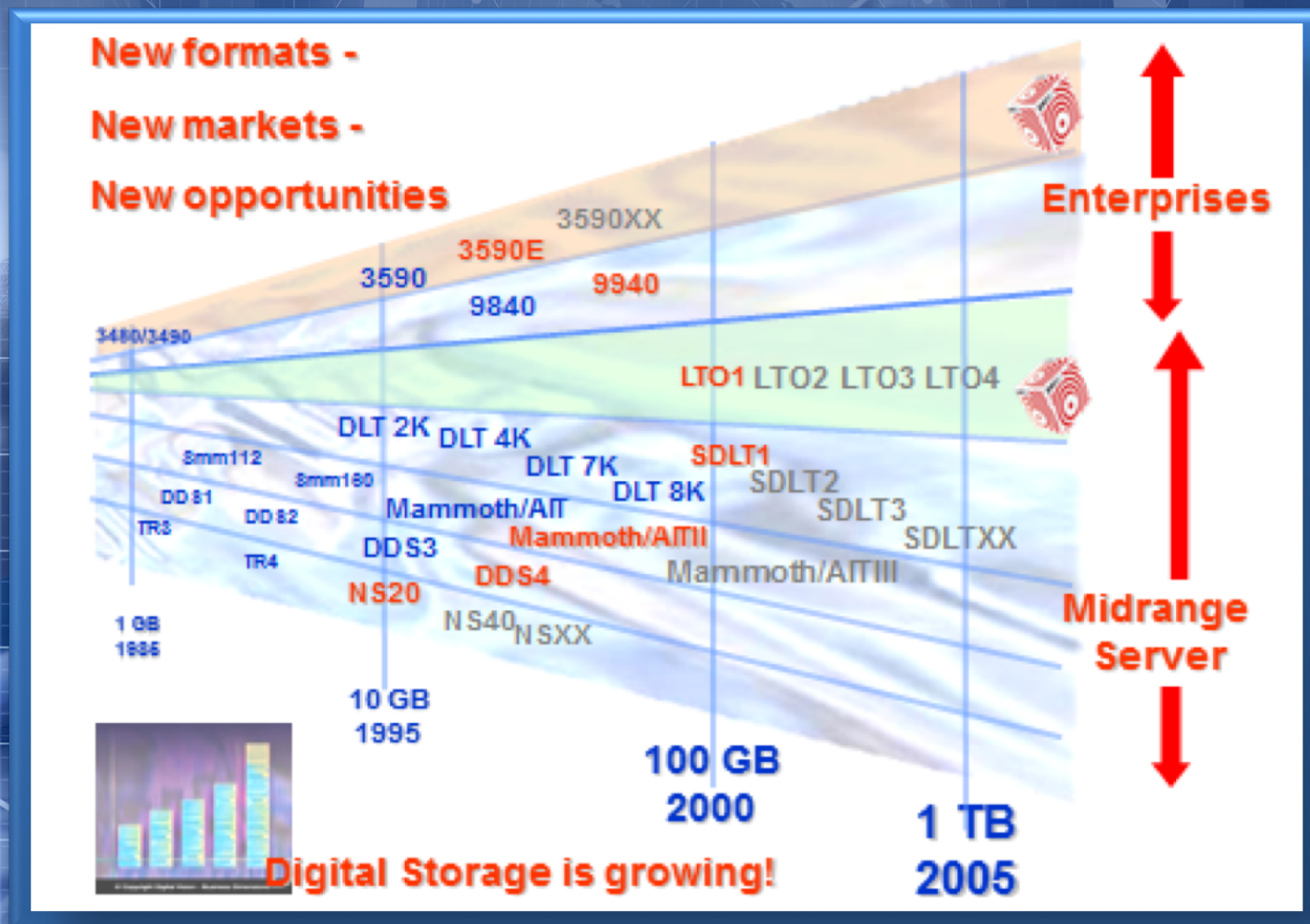
- 6,000 carts per library
- TimberLine 9490-0.8 GB
- 3490 cartridges
- 714 sq. ft. (216 sq. m)
- 16,400 lbs. (7,426 kg)

2017



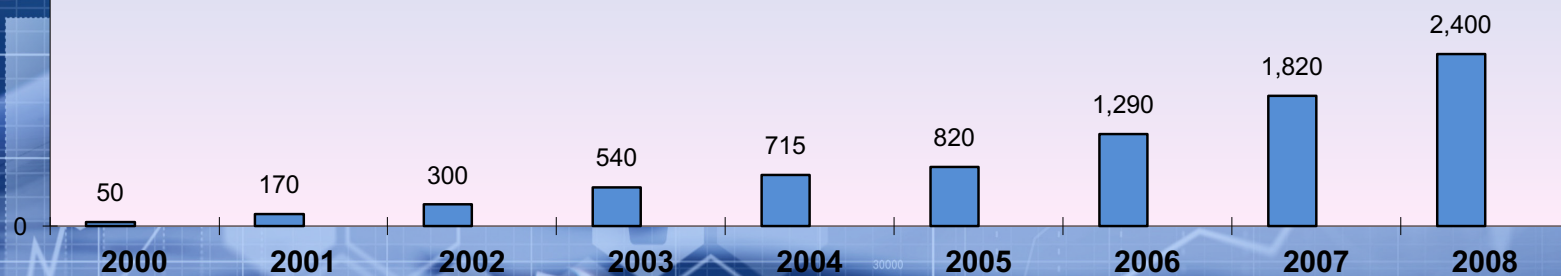
- 1 cartridge
- LTO-7 is 6.0 TB
- 0.15 sq. ft. (0.46 sq. m)
- 0.6 lbs. (0.272 kg)

Formats From The Past



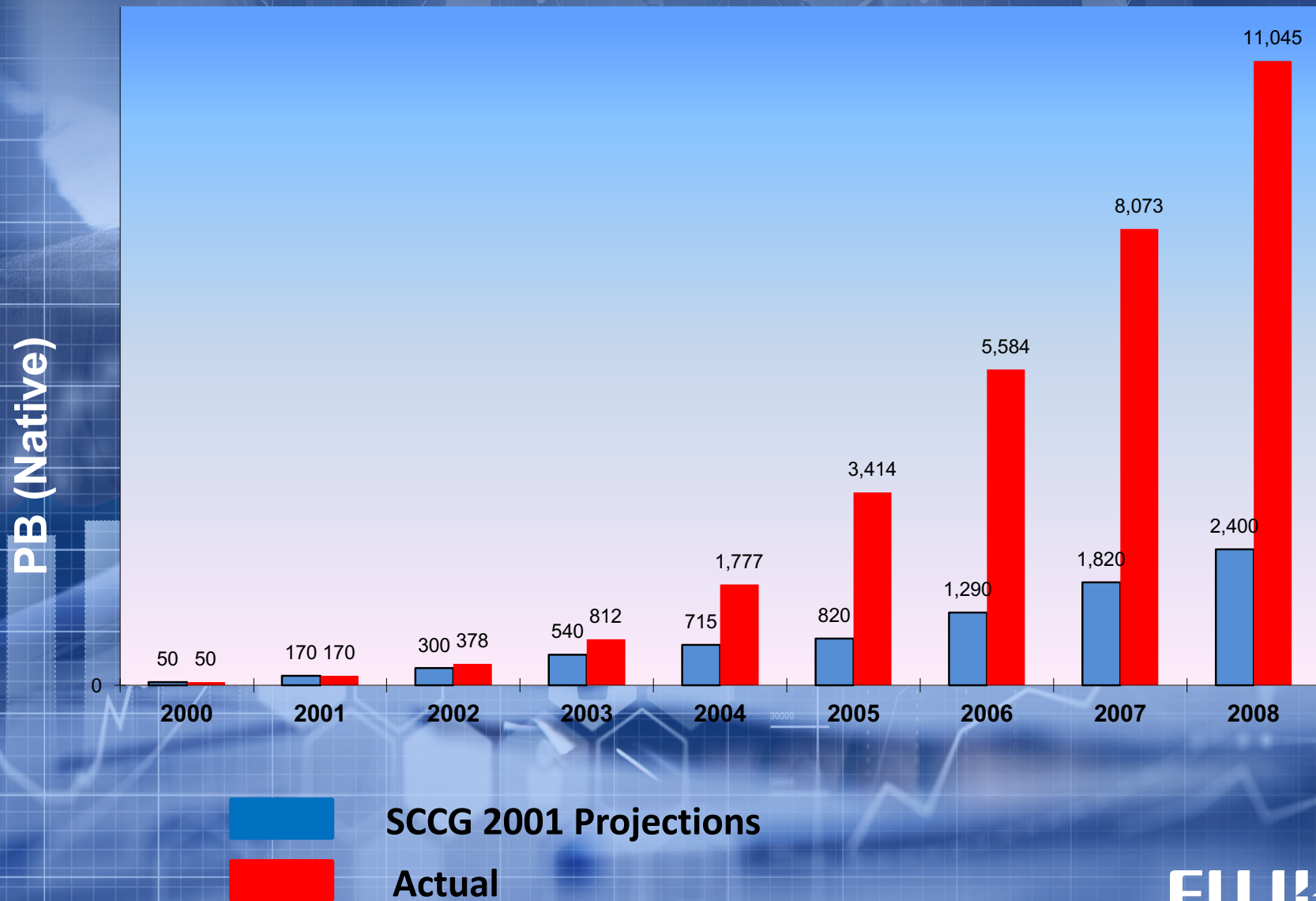
2001 WW LTO Capacity Projections

PB (Native)



SCCG 2001 Projections

2001 WW LTO Capacity Projections vs. Actual



Market Predictions

“There is *no reason* for any individual to have a computer in their home.”

KEN OLSEN, president, chairman & founder of Digital Equipment Corporation¹

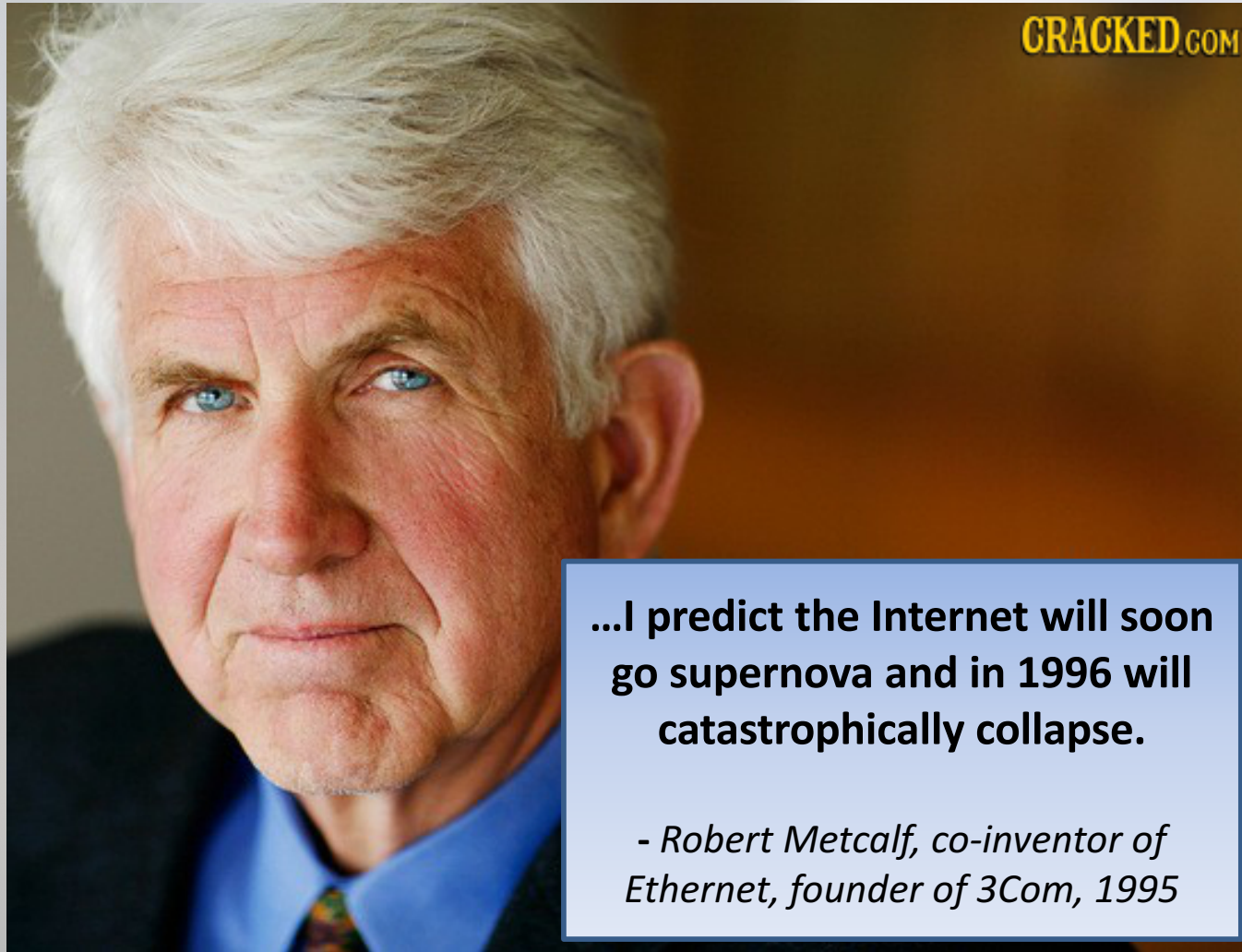
1977

Market Predictions

"We will never make a 32 bit operating system." — Bill Gates, 1989



Market Predictions



Market Predictions

**Next Christmas
the iPod will be
dead, finished,
gone, kaput**



Alan Sugar, 2005

Market Predictions

There's no chance that the iPhone is going to get any significant market share. No chance

Microsoft CEO Steve Ballmer, 2007

Cloud

**"The Cloud: Risky,
Unreliable, and
Dumb"**

-John Dvorak, PCMag 2011

**"Cloud will increase
from \$67B in 2015 to
\$162B in 2020"**

-Forbes 2017

Market Predictions



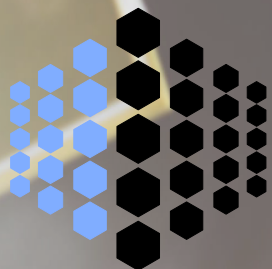
**“If the storage industry
does not invest in
new technology we
will not be able to
handle data growth
20 years from now”**

-Peter Faulhaber, 1997

How Fujifilm Is Investing In Technology To Support Change

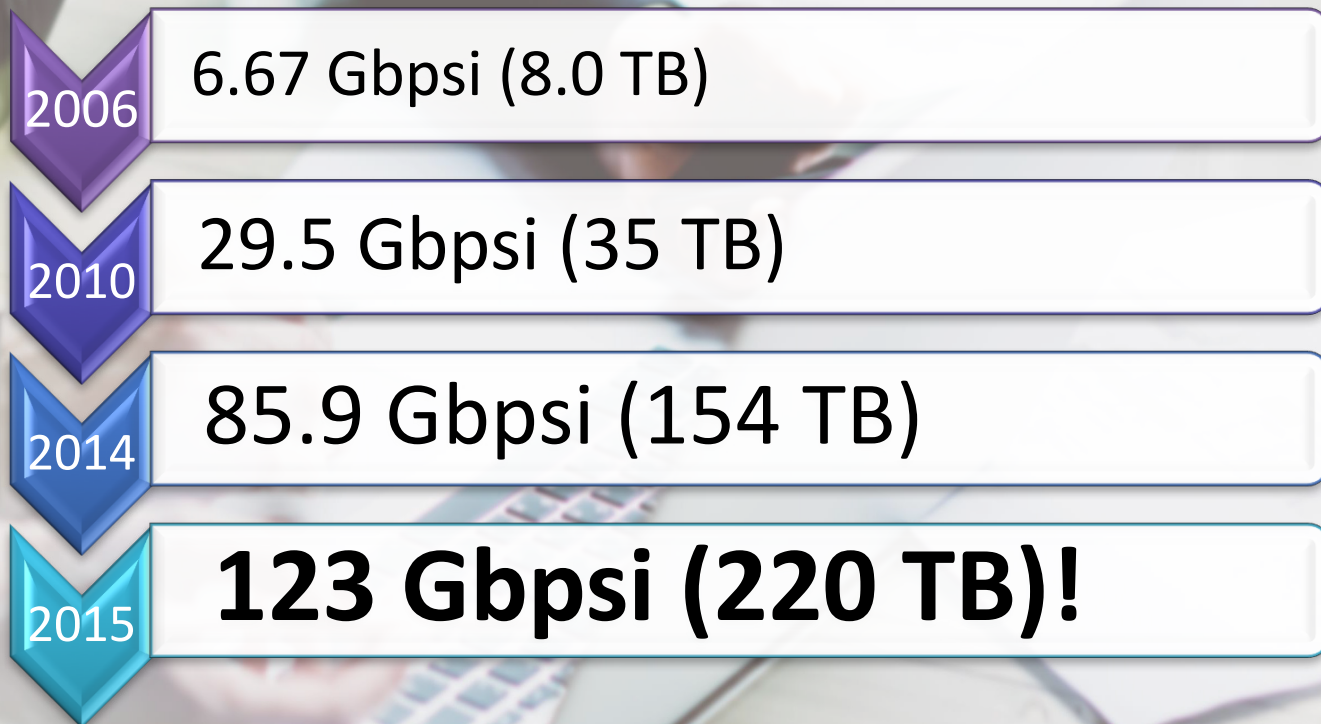
With our advanced coating and particle technologies, many capacity breakthroughs were and will continue to be achieved...





Barium Ferrite

On April 9th, 2015 Fujifilm and IBM announced the continuing increase of potential native tape capacity with BaFe.



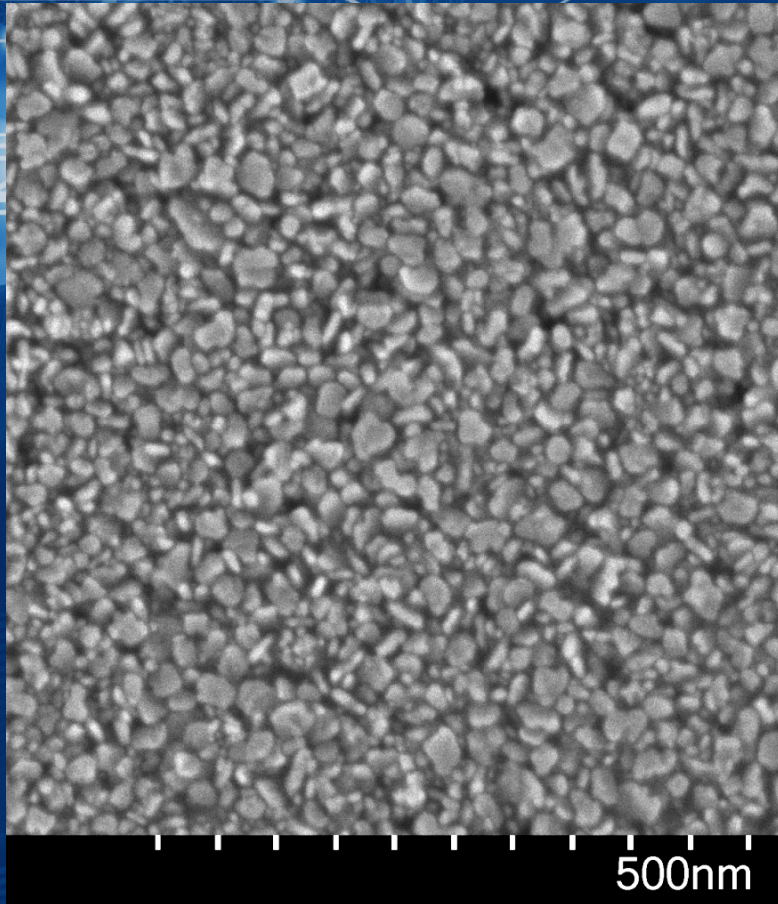
Strontium Ferrite

- Fujifilm is working to commercialize a new magnetic particle that has the potential to store up to 400 terabytes per cartridge, or 67 times more than LTO-7 capacity
- This new magnetic particle is “Strontium Ferrite” (SrFe) and has magnetic properties that are even better than BaFe
- This new particle technology can be applied beyond LTO-10
- Fujifilm has been doing extensive research and development on SrFe since late 2012 and have now completed IP applications

Strontium Ferrite ($\text{SrFe}_{12}\text{O}_{19}$)

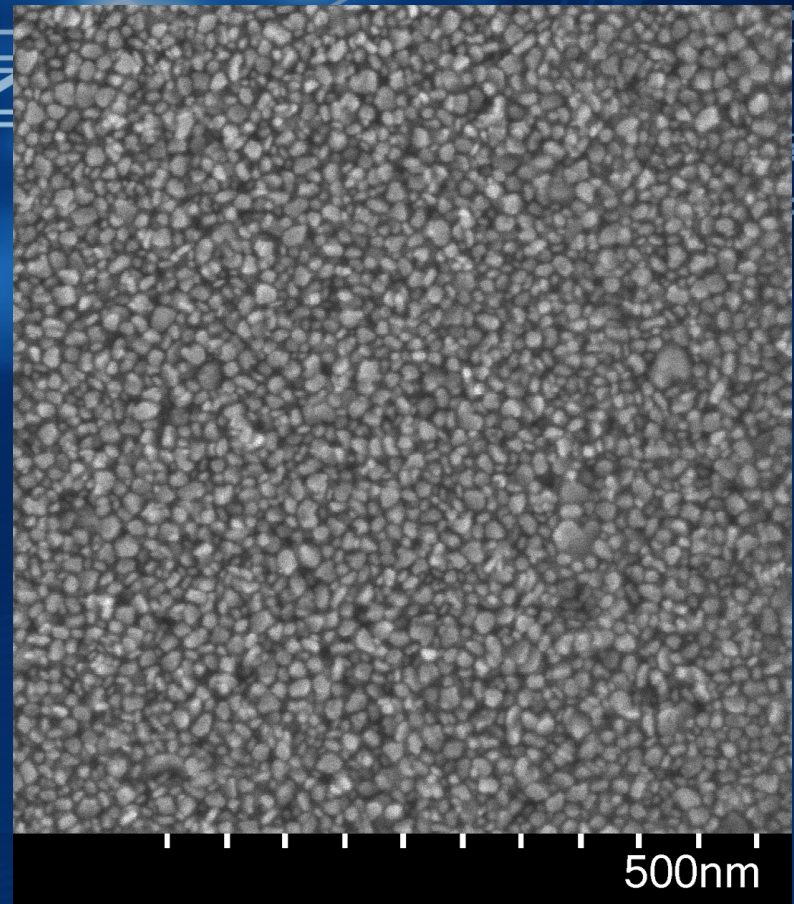
Current **BaFe** particle(LTO-7)

Particle volume: 1900nm^3



SrFe (Strontium Ferrite) particle

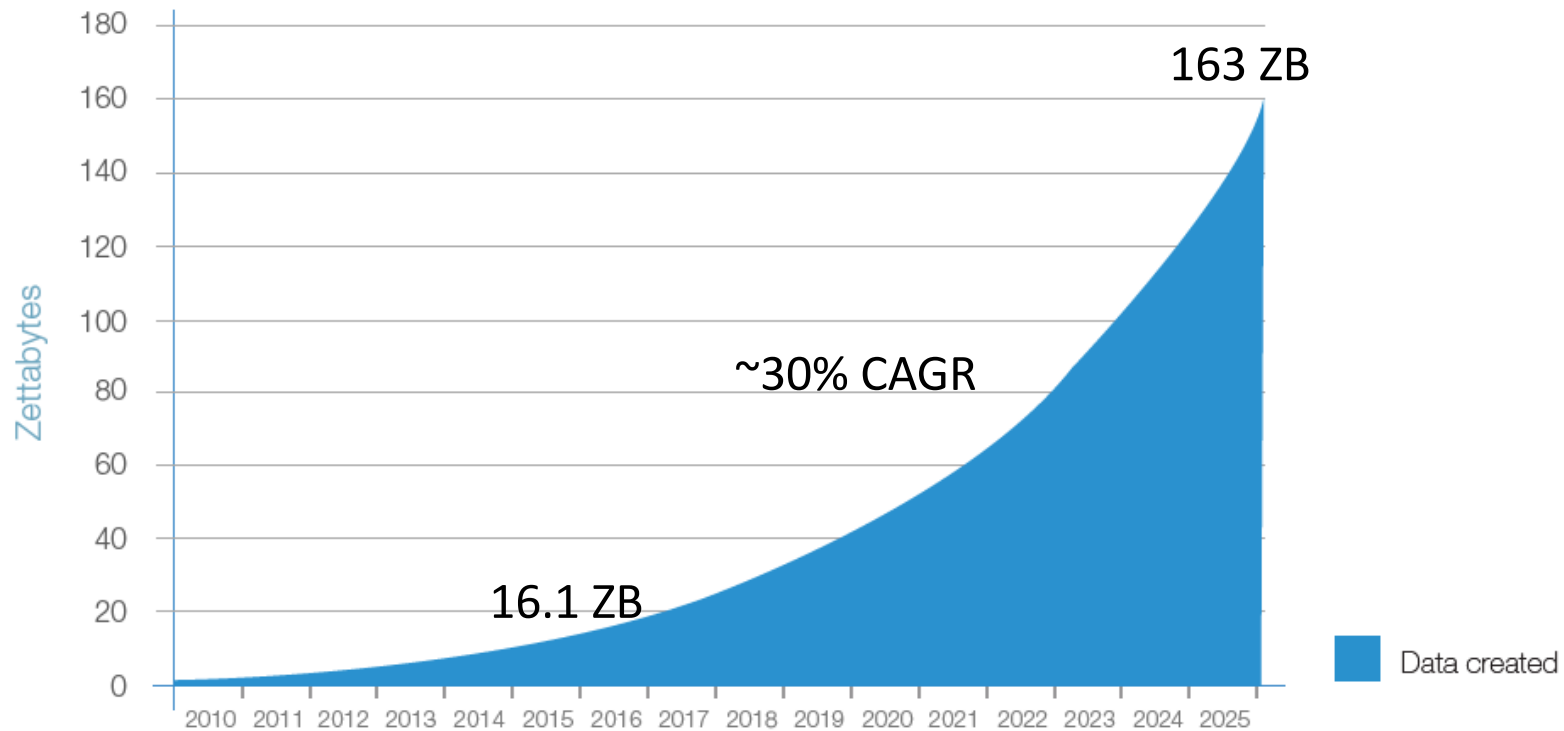
Particle volume: 900nm^3



Dramatic Change In Expected Data Volume

(Includes all digital data and entertainment content)

Figure 2. Annual Size of the Global Datasphere



Source: IDC's Data Age 2025 study, sponsored by Seagate, March 2017

Optimizing Your Storage Strategy



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Questions?

