



4DS
memory

**4DS UPDATE
NOVEMBER 2020**

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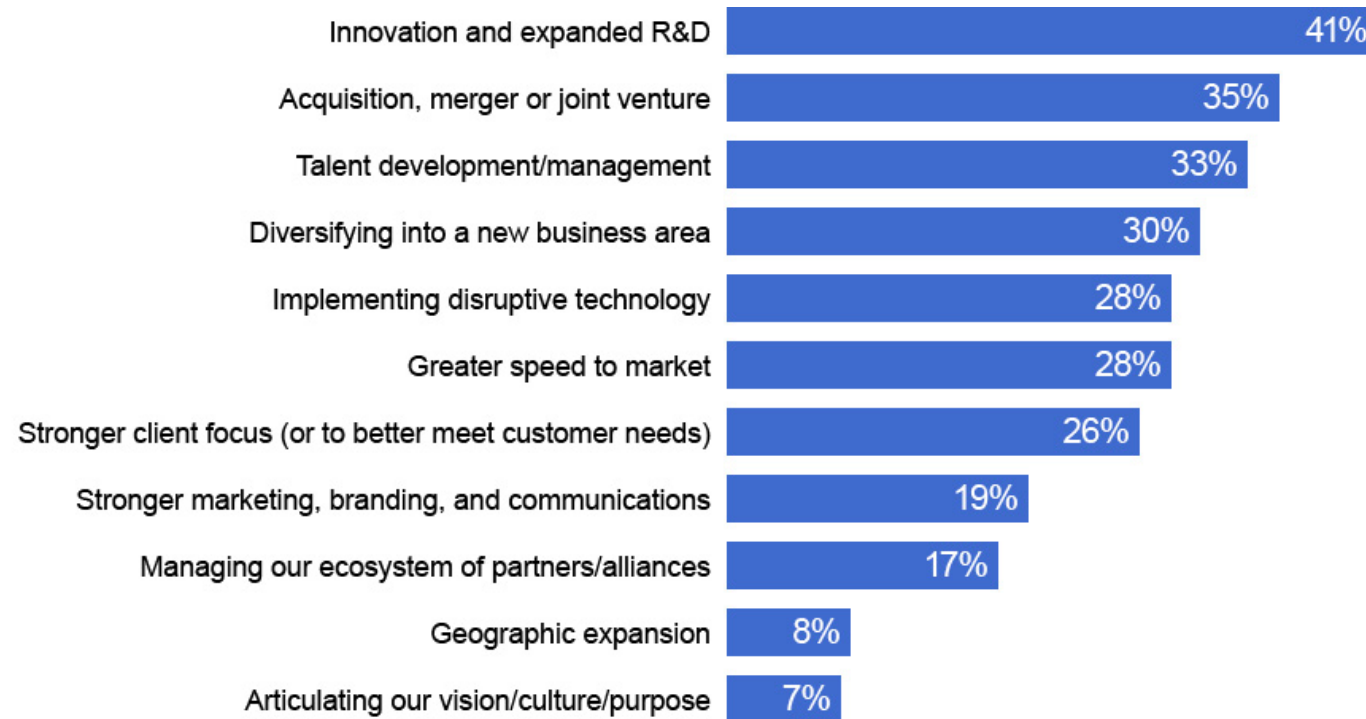
INDUSTRY PRIORITIES.



“As the backbone of the connected world, the [semiconductor] industry’s future is bright”.



Top strategic priorities for semiconductor companies over the next three years:



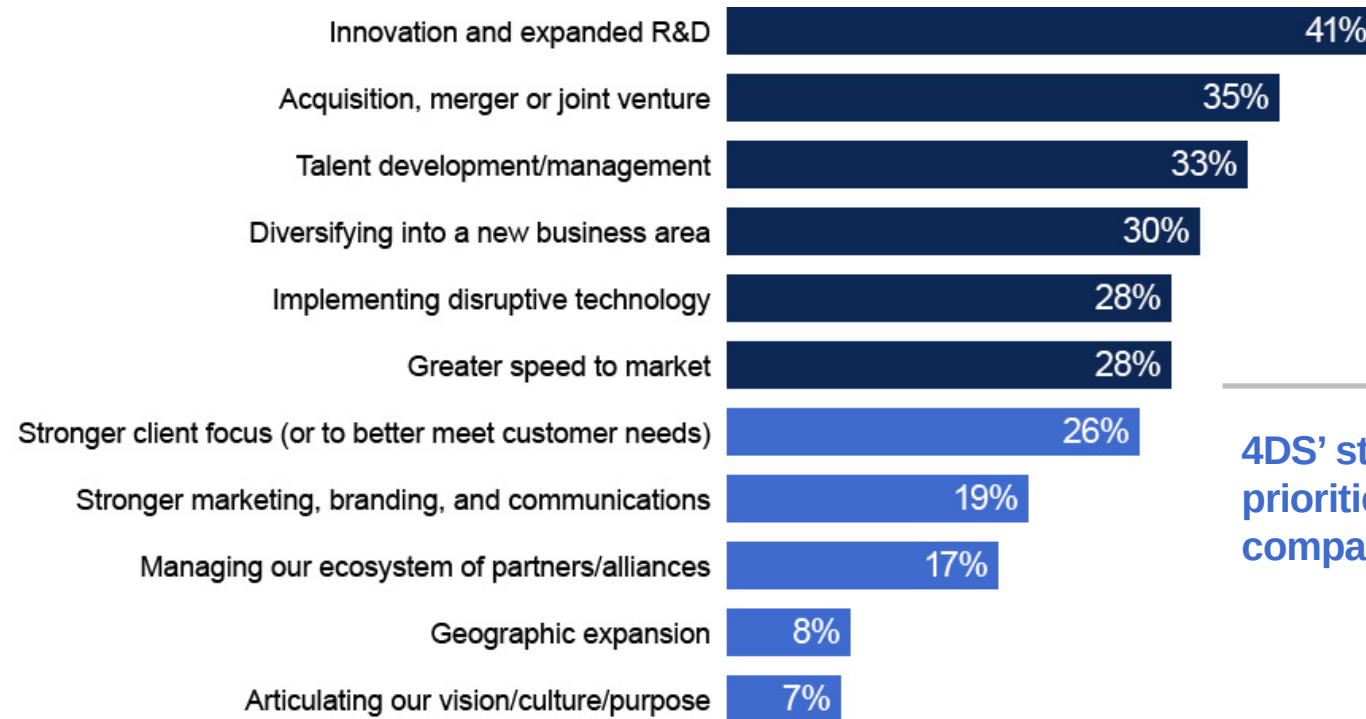
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4DS' strategy aligns with the top priorities of semiconductor companies

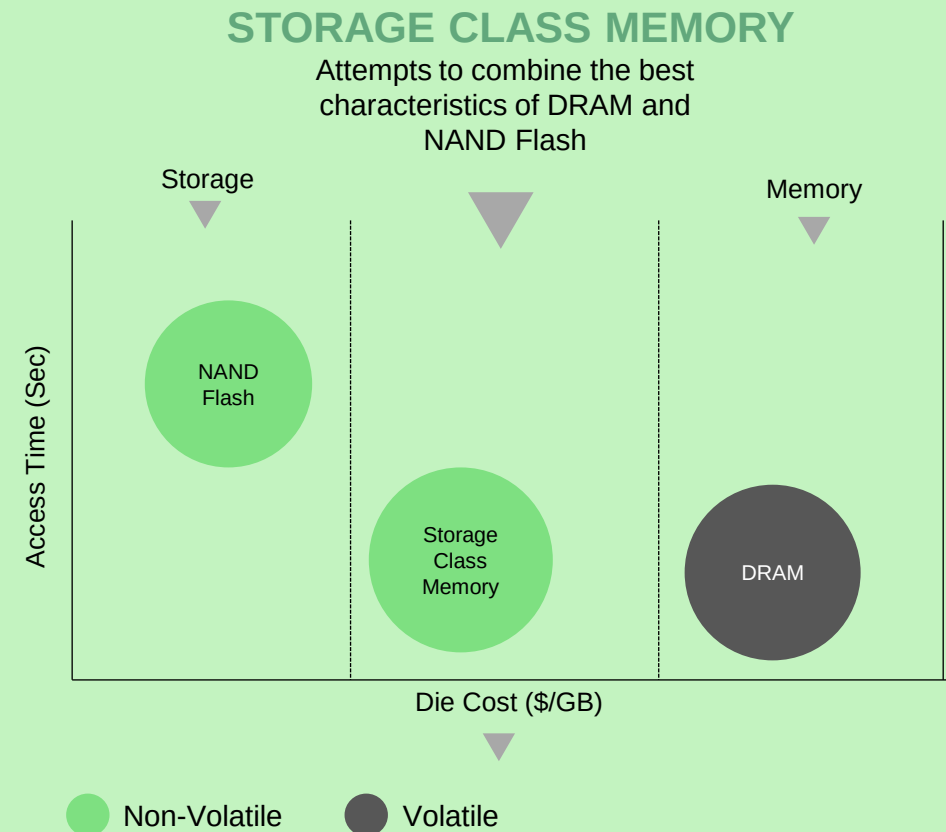
STORAGE CLASS MEMORY.

4DS Interface Switching ReRAM is a unique ReRAM being developed specifically for Storage Class Memory applications.

It will supplement the US\$ 96 billion DRAM and US\$ 56 billion NAND Flash markets – not replace or diminish them or their growth.

Battleground for next generation memory technology.

- ✓ **Faster** DRAM-like read speed
- ✓ **Cheaper** NAND Flash-like costs
- ✓ **Non-volatile** Retains data when power is off



BEST DATA SET RECORDED BY 4DS.

In 2020, 4DS Interface Switching ReRAM showed **record achievements** in relevant Storage Class Memory categories:

- ✓ Best endurance data recorded – two to three times better than previously reported*
- ✓ Highest recorded speed near DRAM speed – an area-based ReRAM first – **US patents now granted***
- ✓ No need for speed crippling error correction – **a ReRAM first – US patents now granted**
- ✓ Retention data recorded – additional studies to be completed to assess upper limits
- ✓ **Data validated by two of the world's leading semiconductor participants – imec / HGST**



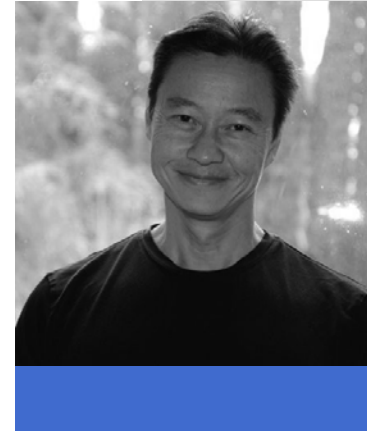
*ASX Announcement 24.06.2020

BOARD AND MANAGEMENT STRENGTHENED.



Drs. Wilbert van den Hoek

- Post AGM will assume role of Non-Executive Chairman
- 17 years at Novellus Systems - Chief Technical Officer and Executive VP from 1999/2005 and President and CEO of Novellus venture arm from 2005/2008
- Novellus was a leader of advanced process equipment and was acquired by Lam Research Corp for US\$3.3 billion in 2011
- Board member of Cypress Semiconductor Corp from 2011/2017, a leader in innovative solutions for multiple industries
- Cypress was acquired by Infineon Technologies AG for US\$ 10 billion in June 2019
- Currently Executive Chairman of Neocera LLC, Chairman of Jiaco Instruments BV and a Director of Innovent Technologies LLC



Mr Ting Yen

- Appointed VP of Process Integration
- 30 years' experience in commercialisation of memory technologies
- Various roles at Integrated Memory Technology, Netlogic Microsystems, Integrated Device Technology, Cypress Semiconductor, Paradigm Technology and Philips Research

COMPANY HIGHLIGHTS.



- ✓ World-leading Silicon Valley based Interface Switching ReRAM developer
- ✓ Completed Additional Wafers Lot of 300mm wafers, **most successful to date**
- ✓ **Demonstrated record improvement in speed and endurance**
- ✓ 4DS is the most advanced Interface Switching ReRAM
- ✓ **The most promising Interface Switching ReRAM cell for Storage Class Memory**
- ✓ Joint development agreement with Western Digital subsidiary HGST since 2014
- ✓ Strategic collaboration with imec signed in November 2017
- ✓ 28 granted US patents wholly owned and 4 pending or filed
- ✓ Strengthened board and management
- ✓ Sale Incentive Pool in place for eligible US management
- ✓ A\$ 7.585 million in cash as of September 2020

SEVEN YEAR PARTNERSHIP WITH HGST.

HGST is a subsidiary of Western Digital Corporation (US\$ 13.5 billion market cap), one of the largest global leaders in digital storage

- ✓ Strategic innovator in emerging high growth technologies
- ✓ Commenced JDA in 2014 – **Renewed in 2015, 2016, 2017, 2018, 2019 and 2020**
- ✓ Insight into what is important in a data-centric world
- ✓ **Now actively involved with 4DS / imec and remains committed to Storage Class Memory**
- ✓ Siva Sivaram, President of Technology and Strategy at Western Digital , commented “**We are committed to ReRAM, it is scalable with greater density, lower cost and latency and longer endurance**”*



IMEC. WORLD # 1 AND 4DS PARTNER.

imec is the **world's #1** independent semiconductor development institute

- ✓ Collaborates with the who's who of electronic products and systems
- ✓ Collaborates with makers of high-volume high-density memories
- ✓ Has a world leading track record in the transfer of semiconductor processes
- ✓ Uses the same tools as industry for high-volume production of high-density memories
- ✓ Has a proven megabit memory platform to fast-track development of megabit chip
- ✓ Used this platform to explore a wide range of emerging memories



imec

COLLABORATION OBJECTIVES.

- ✓ Develop a **fully transferable** fabrication compatible process, using 300mm wafers
- ✓ Mimic industry standard high-volume production on industry equipment
- ✓ **On track** to incorporate new technical developments into Second Non – Platform and Second Platform wafers*
- ✓ End goal is to demonstrate the ability to fabricate a **4DS Interface Switching megabit chip with fully functioning Storage Class Memory characteristics and / or complete a corporate transaction in 2021**



mec

*See ASX announcement 28/10/2020

CAPITAL STRUCTURE.

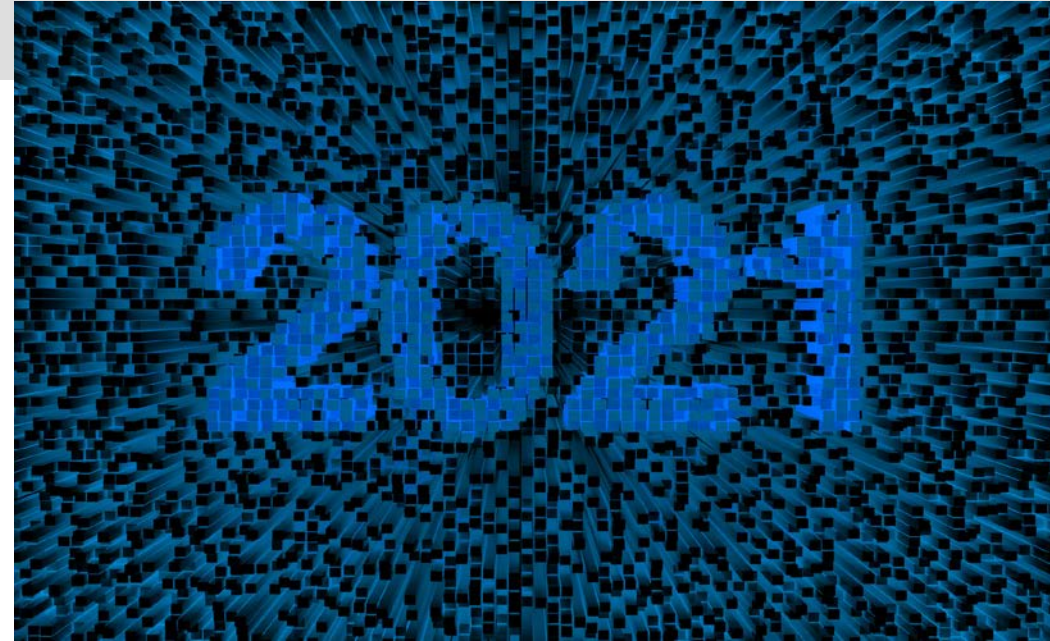


ASX Code	4DS
Market Cap (Fully Diluted)	A\$ 200 Million*
Ordinary Shares on Issue	1,310 Million
Unlisted Options	70 Million
Cash	~A\$7.585 Million – September 2020

*As at 24 November 2020

VALUE PROPOSITION.

- ✓ 4DS is developing a **breakthrough Interface Switching ReRAM Storage Class Memory** solution
- ✓ Recently produced **pivotal data** applicable for **Storage Class Memory** and **best to date**
- ✓ Seven-year strategic partnership with **HGST, leader in digital storage**
- ✓ **imec** - strategic collaboration to develop megabit chip with the **world # 1 developer in nano electronics**
- ✓ **Strong patent portfolio with 28 granted patents** wholly owned and developed in-house
- ✓ **World-class team** of memory specialists, material scientists and test engineers
- ✓ Board experienced in founding, building and **exiting high tech companies, with Incentive Sale Pool now in place**
- ✓ **Sufficient cash to meet current objectives – a megabit chip or corporate transaction in 2021**

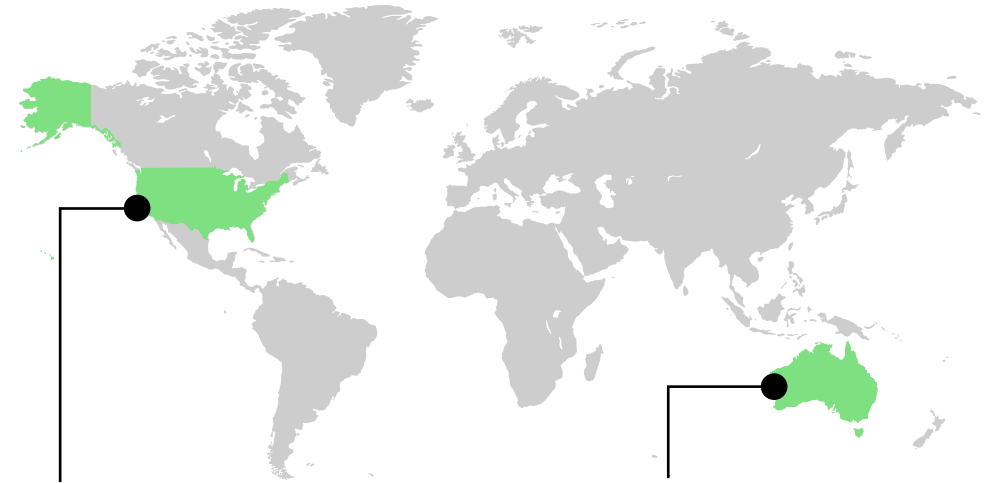


4DS is addressing the massive memory demands of tomorrow



THANK YOU.

ABN 43 145 590 110
ASX Code: 4DS
www.4dsmemory.com



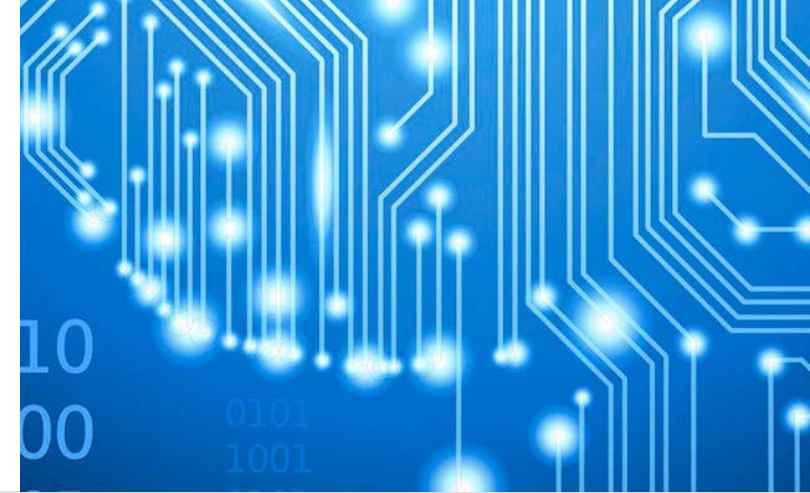
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AUSTRALIA

SALE INCENTIVE POOL.



Upon a liquidity event occurring, Dr Guido Arnout, Drs. Wilbert van den Hoek and US based employees (“Eligible Participants”) will each be entitled to receive a proportion of the Sale Bonus Pool. **Dr Guido Arnout will be entitled to receive 30%, Drs. Wilbert van den Hoek will be entitled to receive 25%**, with the balance to be allocated to Eligible Participants at the discretion of the Board.

	Sale Bonus Pool
Sale Value of US\$120m to US\$350m	5.0% of the Sale Value
Sale Value of US\$350m to US\$550m	US\$17.5m plus 6.25% of the excess above US\$350m
Sale Value above US\$550m	US\$30.0m plus 7.5% of the excess above US\$550m

BOARD AND MANAGEMENT.*



Global expertise in
founding and building
high-tech companies.



Jim Dorrian
Non-Executive
Director

- Served as CEO of several Silicon Valley companies
- Extensive M&A experience
- Partner at VC firm Crosspoint Venture Partners



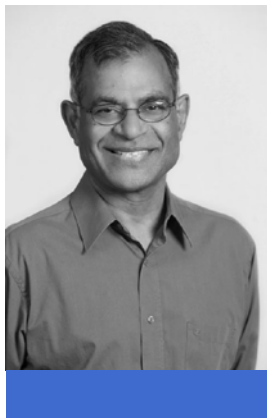
Dr Guido Arnout
CEO &
Managing Director

- 30+ years in commercialising electronics technology
- Successes include, Power-Escape, CoWare, CrossCheck Technology and Silver-Liso



Howard Digby
Non-Executive
Director

- Former senior roles at IBM, Adobe, Gartner and the Economist Group
- Director of Vortif Ltd, Cirralto Ltd, Elisight Ltd and Hearmeout Ltd
- Advisor to a number of technology companies



Dr Seshubabu Desu
Chief Technology
Officer

- Expert in thin films, semiconductor processing and non-volatile memories
- Professor, Dean and Head of Electrical Engineering at various universities



David McAuliffe
Executive Director

- Experienced company director
- Involved in numerous capital raisings and in-licensing of technologies
- Founder of several companies in Australia, France and the UK, many of which are now ASX listed. The most recent - Invex Therapeutics



Michael Van Buskirk
Chief Engineering
Officer

- Executive roles with a number of leading memory companies in Silicon Valley
- These include Adesto Technologies Corporation, Innovative Silicon Inc and Spansion Inc.

* Drs. Wilbert van den Hoek will be Chairman post AGM

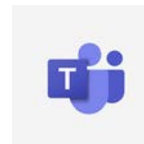
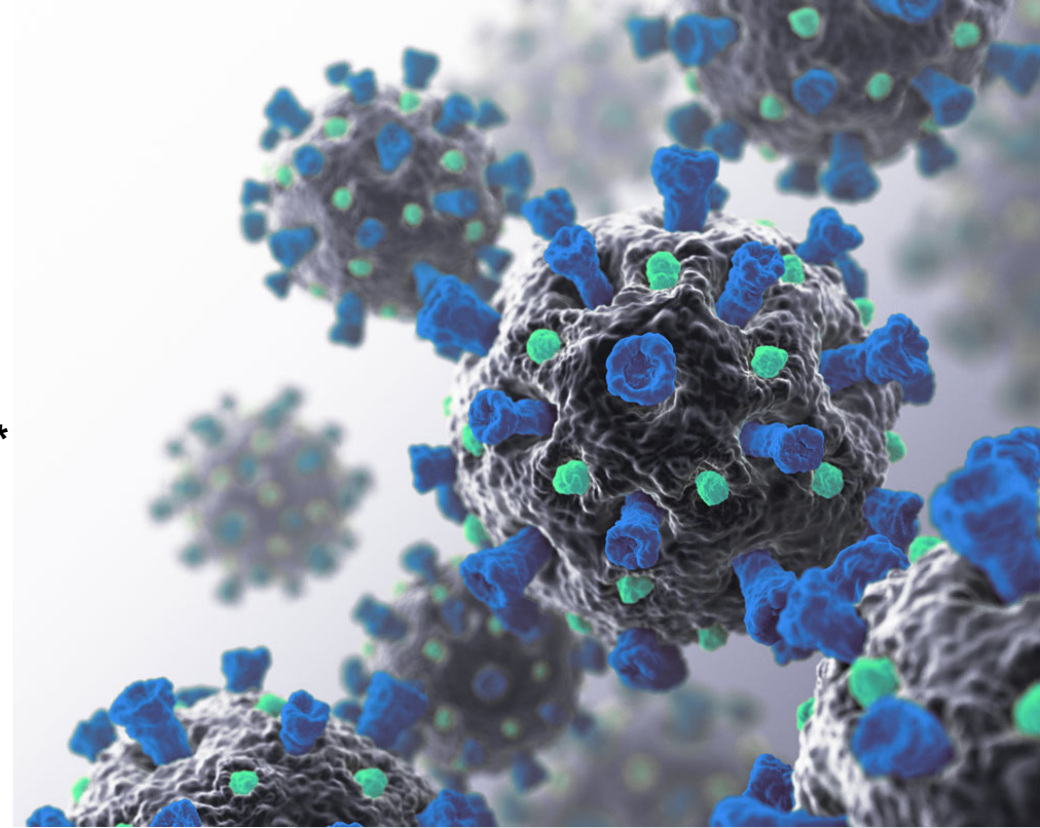
2020 DATA EXPLOSION.

COVID-19 lockdowns have seen exponential increase in data usage*

- 3,800 years of Google Meet sessions in one day
- 50,000 years – the amount of media Americans streamed in one day
- 2.7 billion Teams meeting minutes in a single day
- 2,900% increase in daily Zoom participants since end of 2019
- 775% increase in Microsoft cloud service usage

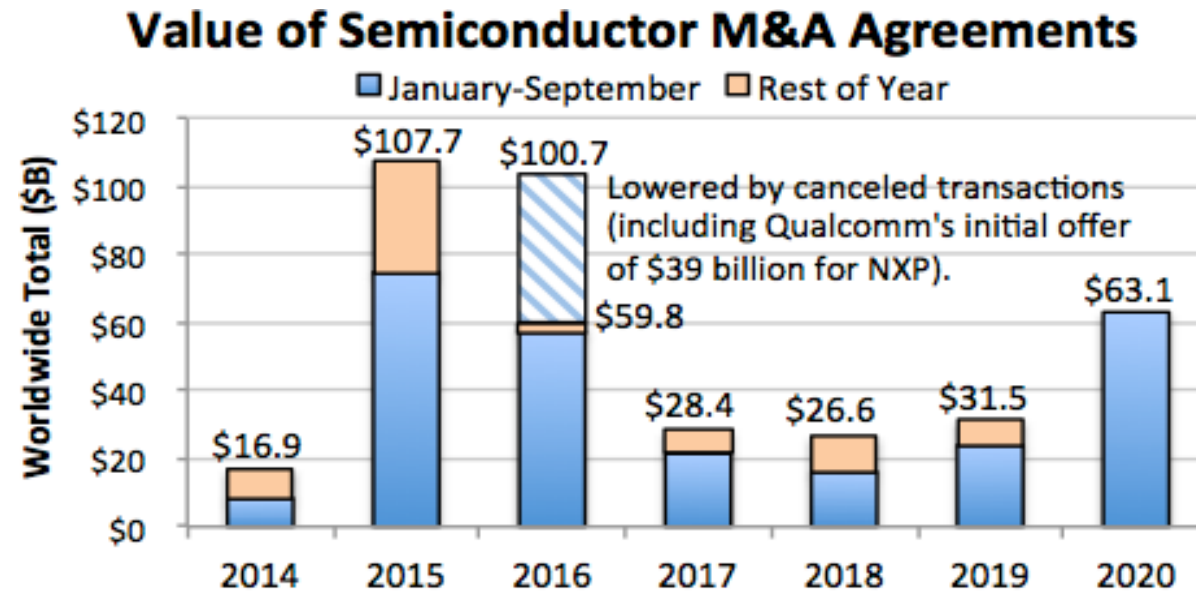


4DS' Storage Class Memory technology is emerging as a leading new category to extend the memory hierarchy, which is needed going forward now more than ever.



*<https://www.digitalinformationworld.com/2020/06/internet-data-usage-increases-amid-the-covid-19-infographic.html>

M&A: SECOND LARGEST IN HISTORY.



Source: IC Insights

