

# MKW Ventures Consulting, LLC

## Overview

Mark Webb

Q4 2023

[www.mkwventures.com](http://www.mkwventures.com)

[Mark@mkwventures.com](mailto:Mark@mkwventures.com)

505-681-7614

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# Experience

- Mark K Webb is Principal of MKW Ventures Consulting LLC
- 23 Years at Intel Corporation and IM Flash Joint Venture with Micron
  - Fab Manufacturing, System Manufacturing, Device Engineering, Product Engineering, Q&R Engineering. Flash, Logic, Communication technologies
  - Most recent: Manufacturing Director for Intel NVM solutions Group, Product Engineering Manager for IM Flash JV reporting to Senior VP/Corporate Officer
- Left Intel in July 2012, Started consulting business
- Focus on Business development for Memory/Storage and Memory technologies
  - NAND/DRAM cost, New NVM cost and product roadmaps
  - TSMC vs Intel Foundry, Samsung Foundry. Can Intel be successful in IDM2.0
- Clients have been OEMs/ODMs, Memory Companies, Storage/HDD companies, Industry Analysts, Sell and Buy side analysts
- Industry Contacts (monthly contact/exchanges) include
  - Senior Engineers and managers at multiple Memory manufacturers, Storage companies
  - Engineers and Managers at Logic manufacturers, Technology Companies, hyperscalers
  - Leading memory/SSD/Semiconductor industry consultants and analysts
- Mark's Experience and knowledge of Memory and Fab technologies is industry leading.

# Q4 2023 Focus Areas

- NAND and DRAM costs and technology. Industry recognized expert
- AI impact on DRAM and memory Markets. Cost and volume for HBM and growth forecast
- SSD vs HDD markets, growth, costs, strategies
- Logic (IDM and foundry) and Memory Fab wafer and unit costs
  - SOC costs, pricing, technology node roadmaps
  - Intel vs TSMC costs, 3nm vs 5nm and future 2nm costs
- China semiconductor ramp and trade issues
- Presented multiple papers on NVM/NAND/DRAM at annual FMS
  - Leading edge predictions on DRAM, NVM, NAND roadmaps each year

# 2023 Reports/Analysis

- NAND/DRAM Market
  - Current and modeled costs over time for industry and major suppliers
    - Wafer, assembly, test cost breakout
    - Quantitative Impact of different quality levels, screening, ECC/overprovisioning
  - Our Pricing Model and comparison to Dramexchange/Inspectrum
- New NVM Memories/Emerging Memory
  - Industry leading info on MRAM, ReRam, FERAM
- AI Memory: HBM impact, graphics memory, SSD vs HDD needs. Volume over time
  - HBM volume, technologies, AI server share, Non-AI server impact
- Intel Foundry Business, Strategies and data
  - Fab start up costs, depreciation models, fixed and variable costs
  - Timing for Intel and Scenarios for new fabs and spinoffs
- Impact of Chips act and government subsidies
  - Reality vs what is published

# Potential Opportunities

- Who is the low cost producer on DRAM, NAND, new NVM
- When will HBM memory be more than 10% of DRAM bits
- How does Apple manage supply chain?
- What makes AMD successful or not in taking share from Intel
- Is TSMC, Samsung, or Intel the leader in logic technology... why?
- Why are more HDD bits added than SSD bits each year.
- Who are the winners and losers in this new AI ecosystem? How much Impact will AI servers have.
- What is Intels strategy for the next 10 years in the Foundry business
- Does Intel really have 5 nodes in 4 years?