

MKW Ventures Consulting, LLC

Overview

Mark Webb

Q2 2020

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Confidential: Not for distribution

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
 - SSD Product roadmaps, SSD Market analysis, NAND Markets, DRAM markets
 - NAND cost, New NVM cost and product roadmaps, storage industry
- Clients have been SSD OEMs/ODMs, NAND/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, CE companies
 - Leading memory/SSD/Semiconductor industry consultants and analysts
- Mark's Experience and knowledge of Memory and SSD technologies is industry leading.

Q2 2020 Focus Areas

- NAND costs and technology. Industry recognized expert
 - Comparisons of each company and Gbyte costs.
- DRAM and NAND Pricing, supply, demand
- 3DXP/Optane and new NVM costs and revenue projections
- SSD market analysis and development
 - 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, 5nm vs 7nm vs 10nm costs
- China semiconductor ramp and memory companies
- Presented multiple papers on NVM/NAND at annual FMS
 - Leading edge predictions on SSD, NVM, and NAND roadmaps each year

2020 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
 - NAND supplier models for dealing with customers, lead times, pricing
 - Fab start up costs, depreciation models, fixed and variable costs
 - Our Pricing Model and comparison to Dramexchange/Inspectrum
- SSD vs HDD and NV-DIMM markets
 - Enterprise vs Corp Client vs performance consumer vs consumer
- COVID-19 Supply chain impacts and factory feedback
- New NVM Memories/Emerging Memory
 - Industry leading info on 3D Xpoint Optane, MRAM, ReRam, NRAM
 - When will these take off and how big will the markets be
- China Memory Plans and Technology Status
 - WSPM and revenue for next 5 years

Potential Opportunities

- Who is the low cost producer on DRAM, NAND, new NVM
- When will MRAM, ReRAM and other technologies Ramp?
- Will SSDs ship more bits than HDDs ? When?
- Why does the Dramexchange pricing not match actual pricing. How much do people really pay for DRAM and NAND?
- How does Apple manage supply chain?
- What are strengths and weaknesses for each semiconductor company
- Why is it so hard for AMD to take market 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.
- Will NV-DIMMs/Optane disrupt compute and storage?
- How is COVID-19 affecting semiconductor Fabs and assembly test.