

## Equities

5 June 2012 | 5 pages

# Big Data University

## Notes from Conference Call with Prof. Daniel Abadi

- **Big Data University** – We hosted a conference call today with Dr. Daniel Abadi, computer science professor at Yale University and one of the world's foremost academic experts on database technology. Replay: 719-457-0820, passcode: 1274317.
- **Déjà vu or just in memory?** – Abadi highlighted databases running in main memory (e.g. SAP's HANA) as a significant technology advance for transactional databases, potentially on par with the transition from hierarchical to relational databases from 30 years ago. A traditional database could see 10x improvement going from disk to RAM, and another 10x for a total 100x improvement if the database is re-architected for RAM. However, current relational databases have undergone similar disruptions before (e.g. object orientation), so the debate is whether current vendors can adapt. Oracle, IBM, and Microsoft are well ahead of alternative architectures today, and Oracle itself has a database architected for in-memory (TimesTen). In addition, current in-memory vendors have difficulty with data persistence, often trading throughput for persistence.
- **The elephant in the data warehouse** – Abadi expressed his minority view that while Hadoop is still early in its development, Hadoop could ultimately displace traditional data warehouse systems from vendors such as ORCL, IBM and Teradata over a 5-10 year time frame. With significant investment coming from the VC and open source communities, Abadi sees current gaps in Hadoop (e.g. SQL interfaces and not real-time) as abating over time. He is in the minority with his view, as most expect that Hadoop will co-exist with traditional technology. We note that while virtually all DW platforms today have connectors into Hadoop, data transfer is a significant bottleneck to processing. In addition, as Abadi noted, growth in unstructured data exceeds that of structured data and Hadoop is usually required for preprocessing unstructured data. Unstructured trends could further tilt the warehouse toward Hadoop.
- **NoSQL = NicheSQL?** – NoSQL has garnered momentum in applications such as gaming where transactional integrity is less critical and in developer communities where SQL backgrounds less prevalent. However, Abadi believes that because these NoSQL systems have traded off ACID compliance (i.e. guarantees around how the data was committed to the database), NoSQL is unlikely to threaten relational databases in enterprise applications that are the core of Oracle's market today.
- **No free lunches** – Abadi highlighted numerous database technology tradeoffs, including read vs. write optimization (row vs. column stores), scalability vs. ACID compliance (RDBMS vs. NoSQL), and persistence vs. throughput (disk vs. in-memory). Abadi did not know of any current system that could converge row and column stores effectively, and the single database for transactional and analytic systems seems some way off.

### ■ Industry Overview

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