Re-thinking the Performance of Information Processing Systems in the Context of SAP HANA
(ICDE Keynote Paper 2013 of Dr. Vishal Sikka, Member of the Executive Board SAP AG)

Barbara Stortz
SVP SAP HANA
www.saphana.com
From Atoms to Bits

- Books, Tape Recorders, Cassettes, Travel Agency Offices, Retail Stores, Desk Phones … are Disappearing
- Replaced by Software/Computers
- Digital Manifestations of Physical Artifacts
- Power transitions from IT to End-Users
- Activities Become Real-Time / Window of Opportunity

- Analogue in the Enterprise Computing
  - Layers upon Layers
  - High Cost and Complexity
  - End-Users get Data that is Old, not Real-Time and Processed/Aggregated
SAP HANA

- HANA is a fully in-Memory, SQL compliant, ACID compliant, Parallel Database
- Designed to Take Maximum Advantage of Cores and Memory
- Transactions and Analytics at the Same Time on the Same Data
- HANA enables New Applications to Offer any Kind of Operations on the Data without Leaving the Session/Context/System or Duplicating the Data
- In Addition HANA is a Platform with an Application Server and a Number of NoSQL Database Features
What are the Business Values

Value  =  Derived Benefit / Incurred Cost

• The Five Dimensions
  • Going Deep
  • Going Broad
  • Real-Time
  • Window of Opportunity
  • Without Preprocessing of Data

• Take Decisions Efficiently in the Window of Opportunity
Performance and the Value of Data Processing

Performance = Amount of Information Processed / Answer Propagation Time
Speed = Distance / Time

- Query Complexity
- Data Size
- Data Detail
- Data Diversity
- Query Execution Time
- Data Preparation Time
Example 1: Food and Beverage Company in China

Amount of Processing Time = f(Query Complexity, Data Size, Data Diversity)
Answer Propagation Time = g(Query Response Time, Data Propagation Time)

Query Complexity: High (Route Optimization)
Data Diversity: 3 (Char, Dec, Time)
Data Size:
   Existing: 565MB
   HANA: 129MB
Query Exec. Time:
   Existing: ~ 25 hours
   HANA: 0.7 sec
Data Prep. Time: 0 sec
Example 2: Leading Bank in Asia

Amount of Processing Time = f(Query Complexity, Data Size, Data Diversity)
Answer Propagation Time = g(Query Response Time, Data Propagation Time)

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<th>Medium (Join &amp; Scan Intensive, 10 ops)</th>
<th>5 (Int, Float, Char, Date, Time)</th>
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<tbody>
<tr>
<td>Query Complexity</td>
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<td>Data Diversity</td>
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<td>Data Size</td>
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<td>Existing</td>
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<td>HANA</td>
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<td>Query Exec. Time</td>
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Benchmarks Have to Evolve Equally

- Take the findings into Account how Business Users Interact with the System
- Applicable for Big Data, applicable everywhere
- Create new Benchmarks to reflect this new reality