SAP HANA
Power of In-Memory Computing

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Solution Advisor, SAP Thailand Ltd.
Reality: Information Explosion

**Gartner** - Enterprise data will grow 650% over the next five years, with 80% of that data unstructured ...meaning that the data explosion spans both traditional sources (point of sale, shipment tracking records, etc) as well non-traditional (email, Web content, documents, etc) performance.
SAP driving innovation: PROCESSES
SAP driving innovation: INFORMATION

“Data In”

Business Process
Systems of Record

“Info Out”

Business Analytics
Systems of Engagement
SAP driving innovation: CONSUMPTION

```
“Data In”
```

```
Business Process
Systems of Record
```

```
“Info Out”
```

```
Business Analytics
Systems of Engagement
```

Mobility
Data – current state
Issues: latency, high cost, complexity

BIG DATA
Unstructured Data
Operational Data Stores
Analytical Stores

Oracle
DB2
BW
Teradata
OLAP

Data Mart

Systems of Record
Systems of Engagement

Business Process
Business Analytics

“Data In”
“Info Out”

Mobility
Data – future state
Benefits: speed, low cost, simplicity

Mobility

“Data In”

Business Process
Systems of Record

“Info Out”

Business Analytics
Systems of Engagement

BIG DATA
Unstructured Data

Oracle
DB2

SAP HANA Database

Operational Data Stores

Data Mart

OLAP

Analytical Stores
How SAP can help Enterprise move faster

Big Data.
Real-time.
Achieve faster Result

In-Memory Computing
Technology that allows the processing of
1. Massive quantities of data in real-time
2. In the main memory of the server
3. To provide immediate results for analyses and decision making
In-Memory Computing

**Conventional Databases**

Disk Read

5 milliseconds

1 Million Times Faster Than Disk

**In-Memory Databases**

Disk Read

5 nanoseconds

“By 2012, 70% of Global 1000 organizations will load detailed data into memory as the primary method to optimize BI application performance.”

- Gartner
A Shift of Frontiers in Computer Science
Freely Adapted from Jim Gray, Turing Award Winner 1998

- Tape is Dead
- Disk is Tape
- Flash is Disk
- RAM Locality is King
Thinking In-Memory

Delegation of data intense operations to the in-memory computing

Today’s applications execute many data intense operations in the application layer

In-Memory Computing Imperative
- Avoid movement of detailed data
- Calculate first, then move results
Speed-up Existing Work

SAP High Performance Analytic Appliance (SAP HANA)

SAP HANA is the engine of the real-time enterprise. It provides a foundation on which to build a new generation of applications, enabling customers to analyze large quantities of data from virtually any source in real time. The example below showcases actual customer performance of a core reporting process.

Runs 350x faster

77 minutes
Before SAP HANA

13 seconds
With SAP HANA
SAP In-Memory Appliance (SAP HANA™)
SAP High-Performance Analytic Appliance

**SAP HANA™**
- In-Memory software + hardware
- Data Modeling and Data Management
- Real-time Data Replication
- SAP BusinessObjects Data Services for ETL capabilities from SAP Business Suite, SAP NetWeaver Business Warehouse (SAP NetWeaver BW), and 3rd Party Systems

**Capabilities Enabled**
- Analyze information in real-time at unprecedented speeds on large volumes of non-aggregated data
- Create flexible analytic models based on real-time and historic business data
- Foundation for new category of applications (e.g., planning, simulation) to significantly outperform current applications in category
- Minimize data duplication
The Inflection Point
In-Memory Computing

Today

<table>
<thead>
<tr>
<th>Memory</th>
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</table>

Tomorrow

| In-Memory |

Hardware

- Multi-core architecture
- Massive parallel scaling
- 64-bit address space
- Upto 2TB main memory
- 100GB/s data throughput
- 10X compression
- Massively parallel processing
- Virtually unlimited size
- Fast prefetch
- Volatile and/or persistent

Software

- Partitioning
- No Aggregate Tables
- Insert Only on Delta
- Compression
- Row and Column Store

Integrating Memory, Cache, Disk, and software layers for seamless data processing.
SAP SW Technology Innovations

- In-Memory Row and Column Store
- Compression
- Partitioning In-Database Computing
- No Aggregate Tables
- Real-Time Replication Insert Only on Delta

**Column = Fast Queries**

5 – 20x

**Analyze Large Data Sets Complex Computations**

**Flexible Modeling No Data Duplication**

**Fast Data Loads**
What Are Customers Doing with In-Memory?

- Pricing Acceleration: 2
- Agile Datamart / Data Hub: 3
- Manufacturing Efficiency: 1
- Network Analysis: 0
- Margin Minder: 2
- Custom: 4
- Financial Analysis: 8
- Operations Performance: 4
- Inventory Visibility: 6
- Spend Analysis: 2
- Sales Analysis: 16
- CO-PA: 6
- CRM: 3
SAP In-Memory Appliance (SAP HANA)

Speed of thought Demo

3.XBillion rows of data
# SAP HANA Customer Testimonials

## Highlighting Value and Benefits

<table>
<thead>
<tr>
<th>Customer</th>
<th>Link</th>
<th>Customer Story</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td><a href="#">Click Here</a></td>
<td>Adobe is using SAP HANA to analyze a large volume of complex data to gain business insights into software piracy, and to develop preventive strategies and explore significant revenue recovery opportunities.</td>
<td>SAP HANA, SAP Business Objects BI</td>
</tr>
<tr>
<td>Infosys</td>
<td><a href="#">Click Here</a></td>
<td>Infosys utilizes SAP HANA to understand profitability by project, conduct “what-if” analysis on the fly with granular revenue and cost data. The company was able to explore and interact with key variables that affected a project’s profitability at all levels within the company.</td>
<td>SAP HANA</td>
</tr>
<tr>
<td>BASF</td>
<td><a href="#">Click Here</a></td>
<td>BASF, a German-based chemical company, uses SAP HANA to speed response times from minutes to seconds, and improve data reliability to optimize their business.</td>
<td>SAP HANA, SAP BWA</td>
</tr>
<tr>
<td>Bosch Siemens</td>
<td><a href="#">Click Here</a></td>
<td>BSH is using SAP HANA to better adapt to customer needs. BSH, with SAP In-Memory Computing, can now perform simulations and create business forecasts in seconds rather than days.</td>
<td>SAP HANA</td>
</tr>
<tr>
<td>Centrica</td>
<td><a href="#">Click Here</a></td>
<td>Centrica supplies gas and electricity to millions of homes and businesses and offers a wide range of energy services. Centrica uses SAP HANA to process and analyze vast amounts of data generated by its smart meter technology.</td>
<td>SAP HANA</td>
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# SAP HANA Customer Testimonials

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<td>INTEL</td>
<td>Click Here</td>
<td>SAP and Intel’s co-innovation efforts with In-Memory Computing on Intel processors, is a game changing technology. SAP HANA reduces database query time from 77 minutes to 13 seconds, a 355x improvement in performance, when run on the Intel Xeon processor 7500.</td>
<td>SAP HANA</td>
</tr>
<tr>
<td><strong>Lenovo</strong></td>
<td>Click Here</td>
<td>Lenovo uses SAP CRM today and plans to use SAP HANA to process 1.8 million contract records with multiple attributes in less than a second, simplifying IT and reducing TCO.</td>
<td>SAP HANA SAP Business Objects BI</td>
</tr>
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<td><strong>Medidata</strong></td>
<td>Click Here</td>
<td>SAP HANA helps Medidata improve the way their clients manage clinical trials process to have real-time analytics available immediately, bringing value to every level within the clinical trial management process.</td>
<td>SAP HANA</td>
</tr>
<tr>
<td><strong>Nomura Research Institute (NRI)</strong></td>
<td>Click Here</td>
<td>NRI, a research and consulting services provider, is able to use SAP HANA to analyze traffic information in Tokyo, and gained the ability to search through 360 million data records approximately 1 second</td>
<td>SAP HANA</td>
</tr>
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<td><strong>T-Mobile</strong></td>
<td>Click Here</td>
<td>T-Mobile plans to use Strategic Workforce Planning application on the HANA platform to make real-time decisions very quickly—66 million calculations and returned the results in seconds to allow for immediate business decisions.</td>
<td>SAP HANA SAP Strategic Workforce Planning</td>
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| CISCO     | [Click Here](#) | SAP and Cisco are working together give customers the ability to make better decisions faster. With in-memory technology, and specifically SAP HANA, users have the ability to simplify the effective delivery of high-value information to business decision makers | SAP HANA
|           |            |                                                                                                                                                                                                             | SAP Business Objects BI        |
|           |            |                                                                                                                                                                                                             | SAP BWA                       |
| Colgate   | [Click Here](#) | Colgate uses SAP HANA in their Mexico branch to manage their sales profitability and analysis reporting, where now sales reps can run reports with real-time results up to 100-300 times faster driving immediate business impact. | SAP HANA                      |
| Deloitte  | [Click Here](#) | Deloitte is gaining clear and immediate insight into its current liquidity and cash flow information using SAP HANA.                                                                                         | SAP HANA                      |
| Hilti     | [Click Here](#) | HILTI is leveraging SAP HANA, to provide better flexibility and performance for reporting and analysis across multiple areas of the business based on millions of rows of data.                                   | SAP HANA                      |
| P&G       | [Click Here](#) | P&G, the world’s largest consumer product company, will use SAP HANA to build the next generation of financial planning and reporting applications, with speed that completely transforms what is possible today. | SAP HANA                      |
Local BI → HANA → SAP ERP 1 → Database → Corporate BI

Local BI → HANA → SAP ERP 2 → Database → Enterprise Data Warehouse (BW)

Local BI → HANA → NON SAP → Database → HANA
VISION – IN MEMORY AS DATA LAYER

- Corporate BI
  - SAP ERP 1
  - SAP ERP 2
  - New APP 1
  - New APP 2
  - Enterprise Data Warehouse (BW)

- HANA

- NON SAP
Big Data. Real-time.

To Empower Your Organization...

...plan smarter ...run faster ...perform better

- Next wave of technology innovation
- Combined in-memory analytics & transactional applications
- Available today, delivered without disruption
- Continuous real-time link between insight, foresight and action
Best Fit.
Thank You
Boonchu Chumsantivut
Business Analytic and Technology Solution Advisor, SAP Thailand Ltd.