Applying SAP HANA In-Memory Technology for Better Business Decisions

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SAP HANA – CHANGING THE WAY DECISIONS ARE MADE

In-memory computing, which is the technology forming the base of SAP HANA, is one of the most promising advances in analytics and decision-making since Bill Inmon and Ralph Kimball debated the correct way to build a data warehouse.

Those two computer scientists focused on how best to design a data warehouse — Top-Down or Bottom-Up — but neither considered a data warehouse that resided entirely in memory. The state of technology hadn't evolved to that point in the early 1990's.

Ultimately, vast quantities of data hold the promise of more complete information and better decision-making, assuming that data can be analyzed and understood, quickly. With SAP HANA, the bottlenecks to analyzing enormous amounts of data in the blink of an eye have been removed.

In this whitepaper we will:

- Understand how humans make business decisions and how technology can help

- Consider data-driven decision making

- Overview of how SAP HANA works

- Discuss hosting HANA in the cloud

Secure-24 is a leading provider of managed IT operations, hosting and cloud services. We provide highly available IT environments, and expert management and support.

PEOPLE MAKE DECISIONS —
TECHNOLOGY DOES NOT

People have been making decisions since the dawn of man, with many centuries devoted to trying to understand the decision-making process. A recent addition to the body of knowledge about decision-making suggests that there are two types of mental processes at work during decision making: inductive and deductive reasoning.

From a business intelligence point of view, it is important to understand that the mental processes driving decision-making are enhanced and improved by analytics. With inductive reasoning, humans have the ability to mix their own unique insights, beliefs, and experiences together and apply them towards a fast decision.

This is the familiar 'gut level' decision. Then through a second process of sound analysis and logical deductive reasoning, the 'gut level' decision can be validated (or not) and a more deliberate decision substantiated.

According to Stephen Swoyer of Radiant Advisors, "Intuitive decision-making can be enriched by data and analysis, though one typically makes 'gut' decisions when one lacks information, or when one simply can't know what to do."

Often the reason one lacks information is because there isn't enough time to find the needed facts before a decision has to be made. In other words, the information is available somewhere, but the situation demands that a quick decision be made. In business, the goal is to minimize or even eliminate intuitive decisions when there is data to make a more calculated and logical decision.

This is not to say that allowing our 'gut' to influence our decisions is undesirable or wrong. But, when faced with an important decision it is best to use both mental processes – inductive and deductive reasoning.

TECHNOLOGY HELPS WITH ACTIONABLE ANALYTICS

To help resolve this problem, SAP HANA and in-memory computing is making it possible to integrate technology with a company's decision-making processes and make data-driven decisions. Companies can decide how to adjust their manufacturing processes, what store locations are running low on stocked items, where to invest more of the budget next quarter, and support countless other day-to-day decisions with accurate performance information.

This is exactly what HANA is capable of delivering. The process of making decisions is frequently something that happens when we are not fully prepared (or informed) to make the decision. Of course major decisions are not part of this scenario, but the hundreds of smaller decisions add up and can total more dollars than the infrequent big decisions. HANA is designed for this purpose and, if the database contains the data you need to support typical decision scenarios in your company, it will be ready even when you are not.

MANAGING VARIABLES FOR BETTER DECISIONS

The problem with gut-level decisions that are made when there is a lack of complete information is that the decisions are frequently wrong, especially in the world of business. If you consider the likelihood of making a correct decision versus an incorrect decision, the result is often not dependent on the importance of the decision, but more on the number of variables and the accessibility of the supporting data.

As mentioned earlier, many small decisions can have a lot of variables to consider, and it is important for businesses to build into their normal processes a way to make informed and intelligent on-the-fly decisions – quickly and accurately.

SAP HANA is the technology that supports this process and can bring a complete 360 degree view of a decision to light before the decision is made.

DATA-DRIVEN DECISION MAKING

Making the most optimal decisions requires perfect information. Data-driven decision making aims to improve the process and decrease the volume of less optimal decisions through better and faster information. But being right requires more than having the right technology and data; it requires a disciplined decision-making process that includes using tools like HANA.

Making quick decisions has always been the domain of inductive reasoning, based on 'gut level' feelings or intuition. Since there is a premium put on making quick decisions, having a bottleneck that slows down the process is considered less than optimal. There is a common saying that goes something like this – 'making a quick, but average decision is better than making a slow, but perfect decision.'

As a species we have survived for millions of years using our intuition, experience and gut to make most decisions; why would we want to change now? Of course there is some truth to that, but what if you could make more 'perfect' decisions quicker?

The intriguing part of analytics today is that we have so much data to work with; far more consolidated and aggregated information today than at anytime in the history of mankind. This massive amount of data is also readily accessible from multiple sources using any of several different kinds of devices.

By analyzing colossal volumes and varieties of constantly changing data, we can uncover threats, opportunities, establish new efficiencies, and make much more informed decisions…quickly.

But, we have to be disciplined in our decision-making

approach. As humans, we have centuries of making snap decisions that influence us every time we need to make a decision. We have to learn to resist the temptation to throw out a quick decision and move on, we have to wean ourselves from the classic decision attitude – 'damn the torpedoes, full speed ahead.'

To embrace data-driven decision making and incorporate it into a business environment means that the current decision making 'culture' may have to change. This change is much more than simply knowing how to use the technologies and tools, it is about 'wanting' to use the data to be better informed.

The only way to achieve this 'want to' attitude is to help the individuals who are making gut decisions to see how data-driven decisions are better and will ultimately benefit them and the company. Using HANA will be a major step in making that happen.

HOW SAP HANA WORKS

HANA is designed to eliminate the lag time for data modeling changes to occur and from the typical delay that is required to load stored data into memory from traditional relational databases.

The HANA appliance takes full advantage of all the new hardware improvements by combining columnar data storage, massively parallel processing, and in-memory computing; and then running the optimized software on off-the-shelf hardware.

The hardware that SAP HANA runs on can be provided by companies such as Dell, Cisco, IBM, HP and Fujitsu using their Xeon processor.

Although HANA consists of a number of layers – hardware, operating system, application, and database; the database design is its most innovative and distinctive characteristic. Traditional database management systems are designed

for optimizing performance on hardware with constricted main memory.

That architecture often leads to disk I/O bottlenecks. The conventional focus has been on limiting physical disk access by controlling the number of pages read into main memory during processing. This bottleneck, limiting access to the physical disk, causes a substantial slow-down in the processing ability of the CPU. Essentially the CPU spends more time waiting than it does processing.

SAP HANA takes a different, unconventional approach. The HANA database is built around the notion that memory is available in abundance and I/O access to the hard disk should not be a constraint. From a theoretical perspective, memory is limited to approximately 18 billion gigabytes for a 64-bit system, so the CPU is never overloaded or underutilized.

To leverage all this data, HANA optimizes memory access between CPU, cache and main memory, eliminating the need to physically load data from hard disk storage. Using massively parallel processing technology distributed across multiple CPUs and servers, the data management system is able to run fully within the main memory.

This approach enables row and columnar based storage options. Columnar data storage is a distinct advantage because it permits HANA to achieve huge compression ratios not possible with traditional databases, thus maximizing the available storage space.

In one example, a HANA user was able to shrink the actual size of the data volume from 35 GB in a relational database management system storage to 800 MB in a column-store design. This reduced the volume by over 98 percent.

Obviously minimizing huge data files increases the efficiency of disk storage systems as well as enabling in-memory computing technology to handle Big Data with relative ease.

REAL-TIME IS NOW PRIME-TIME

Business leadership and management need real-time information to react to changing customer and market situations.

Traditional data mining methods have a processing lag between data creation and the reporting systems. SAP HANA is a tool that delivers flexible, on-the-fly data modeling by providing non-materialized views of detailed information, in real-time!

TECHNOLOGY & MONITORING

Technology and real-time information go hand in hand. Monitoring by definition takes time and human resources, but technology has become an important tool in helping us gain visibility and perceive problems before they occur.

Interestingly enough, as technology evolves we become more aware of situations or events that we should be monitoring, simply because we can monitor them.

Twenty years ago, who would have thought to use a satellite, looking at Earth from a geostationary orbit, to tell us how to drive to friend's house or find a good pizza in a strange city?

SAP HANA and in-memory computing is the next leap forward in high speed data processing. In fact, this leap forward goes beyond anything we've ever experienced because HANA actually provides us with real-time data processing.

SAP HANA technology has transformed how the entire information technology industry thinks about business intelligence and decision-making due to its widespread impact on hardware manufacturers, database systems, software developers, mobile device applications, reporting processes, networking topology and even business strategies.

Business leaders and management need real-time information to analyze market situations and react to rapidly changing customer needs. This has become a reality for every business to survive in a fast-paced world, and real-time insights are now a critical component to business success.

HOSTING HANA IN THE CLOUD

The advantages of bringing SAP HANA into your environment are compelling, but the advantages of bringing it into your company without all the upfront cost is even more compelling.

Secure-24 offers SAP HANA managed hosting to alleviate the day-to-day pains of maintaining your systems. Customers benefit from Secure-24's state-of-the-art enterprise private cloud, offering high performance and availability.

Transitioning your organization to SAP HANA requires a high upfront investment. With Secure-24's hosting solutions, you can replace the costly Capex for a single monthly operating expense.

Our highly experienced SAP Basis teams will proactively monitor your systems and provide full management, so you can focus on the strategic aspects of your business.

SAP HANA TURBO TEST DRIVE

For organizations looking to try out HANA without the upfront commitment, Secure-24 offers an SAP HANA Turbo Test Drive. This offering provides businesses a first-hand experience of HANA's performance with your own data.

Contact Secure-24 today to discuss your customized solution leveraging SAP HANA technologies.

To learn more about how outsourcing your applications and infrastructure to Secure-24 can help your organization achieve its business goals, contact us at:

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