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Intel IT's big data journey (so far)

Businesses are often guilty of operating at a pace that is measured and process driven, in reactive fashion. These businesses observe a problem or development in the marketplace and then collect data to understand and act upon it. In many cases, even though there is genuine intent to solve the problem, the very nature of this approach results in a sub optimal solution – and more importantly, an inability to catch up.

Big data is changing this dynamic, speeding up the business intelligence (BI) and decision making abilities of corporations. Three things are making it possible: the sheer volume of modern data, the lower cost of storage, and open source technologies, such as Apache™ Hadoop™.

In 2010, Intel® IT began standardizing and centralizing the collection, storage, processing, and distribution of the company's vast datasets. We wanted to empower our business groups to solve problems, identify opportunities, create efficiencies, and mine value from the information scattered throughout Intel®.

We created a dedicated data management team to work closely with Intel® business groups to make enterprise data available and useable at the highest quality levels. Working together, the team and our business group partners have identified several use cases where available data and business opportunity aligned.

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The Intel® IT data management team built a big data infrastructure that utilizes the Intel® Distribution for Apache™ Hadoop™ software, Intel® Xeon® processors, a custom analytics engine, and open source analytical tools. With the platform established, they are now able to collect and organize relevant data, both structured and unstructured. They also ensure users can easily retrieve data and apply BI and analytical tools. Without access and analytics, big data is just noise.

Mining value

Our design team in Israel is tapping the big data platform to improve chip design. Using advanced analytics, they are identifying ways to reduce duplication of effort and streamline debug and validation activities in order to cut product time to market. The current focus of this project is to help the silicon validation team cut Post Silicon Validation by 50%. We currently have three Advanced Analytics capabilities in place. The results so far show significant improvements in coverage, debugging and integration. Our goal is to extend these capabilities to System on a Chip (SoC) and shift focus to pre-silicon in 2014.

Reducing Manufacturing Costs

The current focus is based on the personalization of unit testing by analyzing historical information. To date we have made good progress in reducing the timeframe and effort required to test, as well as contributing to the improvement of lot yields in production. Additional capabilities, such as test elimination and power improvements are in process. By the end of 2014, we will be focusing on new projects with the goal of realizing savings to materials, equipment utilization and other areas in manufacturing. Another effort in manufacturing has us focusing on the analysis of production tool log files.

Due to the cost of storage, these log files were not saved or stored, which caused a key dataset related to equipment issues to be missing.

Storing these log files and connecting them to the advanced analytics engine allows deep analysis of production tool log files—spanning thousands of manufacturing devices—to see behaviors, trends, and repeatable patterns. The end result is the creation of maintenance efficiencies, and tool support cost reductions in our factories.

Our sales and marketing teams are using the big data platform to examine the purchase histories of our channel partners and determine their evolving requirements. By better understanding these important customers, we can optimize sales cycles, identify more cross-selling and up-selling opportunities, deliver customizations, and improve channel revenue, which strengthens our ability to meet our customers' needs. The current focus is to drive channel customer engagements based upon analytics, with a goal of creating ~\$20M in revenue upside through the prioritization of new customer engagements. Other activities target optimizing specific offerings and improving when offerings are triggered. Our goal is to extend this to other business segments in 2014 and initiate our efforts in marketing analytics.

These are just a few examples where we have purposefully started with smaller projects and use cases. Now we have an opportunity to do more, learn more, and pursue opportunities that deliver an even higher ROI.

Doing and learning more

If the old way of business was operating behind the curve, I'd say we are currently at the curve with our eye on moving and staying ahead of the curve in the future. This means we must predict what will happen and create the ability to direct or influence the outcome.

To get there, we are working to improve the speed with which we incorporate and

process additional information sources. The faster we are able to collect, organize, and analyze new datasets, the faster we can find and deliver value.

We are also taking advantage of machine learning to increase our collective knowledge. In many ways, big data is like a human brain that continues to learn over time. New information and insights are repeatedly correlated with historical data to unearth even more insights, patterns, and trends. As we continue to add more data and analytical capabilities, we can increase our awareness, intelligence, and value exponentially. Eventually, we will be able to use this knowledge to anticipate and proactively address forthcoming problems and opportunities. We are already making good progress. Our predictive accuracy is better than 60 percent in many areas, with the potential to increase this even higher.

Still, many challenges remain. There is heavy competition for talent, data scientist skills are scarce, and we must continually develop our existing workforce to stay current and competitive. In addition, as we build out the number of use cases, scalability of the big data platform is critical. It is more important than ever to balance our big data investments with the value derived.

I believe we are at the right stage at the right time. We have a strategy, a roadmap, and our big data infrastructure is in place. We are taking a long-term approach, starting small and learning over time. We are building momentum by showing success and quantifying the value.

Ultimately, we will change how we run our business. By making enterprise data readily available for use across the company, we will improve the company's operational efficiency, reduce costs, increase sales and revenue, and boost customer satisfaction.

We always seek to learn from others, so please tell us about your big data journey.

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