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The world is generating ever-increasing amounts of data, along with an acceleration in its richness and immediacy. The exponential growth of the data-centric universe across Big Data and Fast Data applications is also making enterprises rely heavily on fast access to their storage now more than ever before. In a conversation, Siva Sivaram, Executive Vice President of Silicon Technology and Manufacturing, Western Digital and Supria Dhanda, Vice President and Country Manager for Western Digital, India tell how the company is driving innovation in storage products and solutions for application across industries.



INNOVATING FOR PURPOSE-BUILT STORAGE

Could you tell us about some of the trends and challenges you see in the enterprise storage market?

Data creates deeper insights, more intelligence and immersive experiences, and the next decade will drive a continuous flow of data that's more predictive, productive and personal.

Digital transformation is one of the key drivers for storage growth. The rapid increase in the use of cloud, becoming hybrid on/off-premises and stretching to the edge is also driving datacenter traffic. Segments like manufacturing, healthcare, finance, and telecommunications leverage business intelligence using edge computing. Similarly, growth in the smartphone market as the average storage capacity in a smartphone continues to grow, is leading a strong pull for flash products. Developments in the IoT space is also demanding new generation storage technologies to be on par with the growing adoption of technology advancements. This again expands the scope for data storage.

However, outburst in data generation as enterprises go digital is challenging storage solution providers to design storage solutions that can provide competent performance, capacity and reliability at a low cost. At Western Digital Corporation, we enable technological transformations by creating environments for data to thrive. We help organizations extract timely insights from this growing diversity of content, transactions, and feeds and leverage it, in the long run, to help businesses transform faster and achieve breakthroughs.

What are the challenges in terms of the data explosion at the edge?

Adoption of technology and internet penetration has increased significantly in the past few years. This rapid pace of innovation and the abundant amount of data sources creates challenges with respect to technical infrastructures, operating expenses, security and critical failure points. As industries look to collect raw data at the edge via fast data architectures, the approach towards data management changes to cater to this need. Say in the case of autonomous cars, there is a network of sensors generating data every second to pull insights from and make real-time decisions. Features like accident recording and telematics gateways contribute to data burst. General computing, networking architectures and storage solutions would not suffice to manage this real-time data.

Data from the sensors (proximity data) may no longer be required to be pushed to the cloud to help avoid any lags and keep the system moving. The challenge here is to manage and instrumentalize data coming in from varied environments - (temperatures, vibrations, etc.), workloads, remote maintenance, accessibility and longevity. This means that there's no one-size-fits-all solution. Big data revolution has made it possible to connect different sets of data and analyze it to generate relevant and actionable insights. Machine learning brings forth the capability to extract both predictive and prescriptive analytics that would enable organizations to predict their growth and make decisions. Quick response on edge devices require both reliable and resilient storage, and powerful analytical



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tools will need to reside at the edge. This helps convert content into context and passive decisions into informed decisions where timeliness is critical.

We at Western Digital understand these challenges and the growing needs of organizations pertaining to storage and offer them a range of solutions that enable them to store data from edge to core.

Could you give us a peek into the company's latest innovations?

We drive the innovation necessary to stay ahead of new demands in every place where data lives - from sensors to mobile devices to the cloud. Each brand under the Western Digital umbrella (including SanDisk, WD, G-Technology) offers solutions to a wide array of consumers, be it retail, solutions specifically targeted at creative professionals, or enterprise datacenters. Our solutions are offered and implemented across industries like media and entertainment, life sciences, automotive and gaming. Our breadth of expertise and level of integration gives us the ability to deliver carefully calibrated solutions for every type and use of data.

We have created one of the world's most impactful patent portfolios with over 14,000 active patents worldwide to our name. For instance, in line with growing market demands, we leveraged flash technology to create the world's 1st 3D NAND technology with 96 layers. The SanDisk 400GB microSD card is another innovation we brought in last year, as the fastest UHS-I flash memory card in the world equipped with Peripheral Component Interconnect Express (PCIe)-enabled cards driven from India.

Does Western Digital's India R&D centre play a pivotal role globally?

The R&D centre in India is one of our largest Intellectual Property (IP) creation and engineering sites that have made significant innovative contributions in the consumer, enterprise and embedded segments. Some of our most remarkable innovations have come out of India.

When the demand for high capacity storage in smaller form factors continued to increase, we reached a point where the hardware could not be made any smaller - pushing us to innovate a classic solution. We implemented flash technology to create 64 to 96-layer flash devices. So, from thumb-sized cards with 20MB memory, we have now evolved into cards that can hold up to 400GB of storage with no increase in form factor. Innovations from India weren't limited to just this. India took lead in the development of the WD Black NVMe SSD, one of the world's fastest SSDs for laptops and the SanDisk 400GB microSD card. Many of our retail line of products have also been designed, managed, marketed and distributed across the globe from India.

India is known for its considerably large talent base. How do you engage with the available talent base here?

We often hear about the large talent pool that India has to offer, but there is also a pressing issue of brain-drain associated with the talent of this country. However, if methods are employed to manage and hold on to this talent, then there is a definite opportunity for growth here. In the last four years, we have seen Western Digital grow almost 10 times in terms of manpower, rising from a strength of 250 to around 2,300 employees in India, with an increased number of female engineers as well. In this year alone, we plan on hiring close to 75 Masters and PhD graduates from top engineering institutions in India.

For us, one of the key ways of hiring quality talent is through internships. Interns are made to work in diverse ecosystems and are rotated internally to hone their skill sets and learn different areas of work. On-the-job training programs also play an important role in talent acquisition and retention. We also offer scholarship programs in collaboration with top universities. Along with this, our disruptive internal program called Innovation Bazaar provides an opportunity to spur innovative ideas and exchange them.