**Cloud, crowd, and culture: How the IT sector survived during the COVID19 pandemic**

In late March 2020, India came to a halt for a few weeks. At that time, the COVID19 pandemic had begun to fracture the economy. As per the UNIDO, the Index of Industrial Production fell by 65%. However, unlike many other sectors, with the continuous advent of a series of disruptive technologies, the Information Technology (IT) sector was relatively better off. These disruptions can be summed up as three gears that the IT sector has leveraged during these trying times.

The foremost of these gears is the massive cloud revolution. In today’s time, the software application/service, the underlying development platform, functional environment, and finally the infrastructure such as the storage device, processor, and the high-speed server, everything is a code. The pandemic came with a huge upsurge in the demand for cloud-based B2C and B2B services. From the hosting of intranet services to providing access to data on desktop systems to bringing remote teams together on the flat-screen via Microsoft Teams, Slack, Cisco Webex, and Skype were some of the common trends across all offices during the early phases of the pandemic. While many offices and schools would not have been able to afford the real costs of owning cloud infrastructure and deploying manpower resources to manage them, the pay-for-service business model has enabled a majority to continue operations even during the lockdown.

The next gear is an ever-evolving pool of cloud technologies that have ensured reliability and seamless access to online services such as virtual communication, e-shopping, and digital payment wallet. During the lockdown and unlock periods, some of the online businesses and digital services witnessed massive traffic or crowd on their site/platform. For example, in an August blog, Google posted that Meet’s global usage grew by 30x during the pandemic. Similarly, in an April blog, Microsoft shared that Teams globally registered a record 2.7 billion meeting minutes on the 31st March 2020. This unusual crowd was also observed to have a pattern during peak and non-peak business hours.

Figure 1:Microsoft Teams: Minutes of Meeting (in billion)

Source: Compiled by authors based on a blog published on April 9, 2020, on Microsoft’s website and accessed online from <https://www.microsoft.com/en-us/microsoft-365/blog/2020/04/09/remote-work-trend-report-meetings/> on August 29, 2020

Cloud has services such as the Virtual Machine Scale Sets that automatically add or remove virtual machine instances, Azure Traffic Manager that ensures optimum routing of traffic to available service regions, Load Balancer which enables the distribution of traffic across multiple virtual machines and Azure Monitor/Application Insights keeps track of the health of computing resources. These services are provided by all cloud vendors. Hence, it is possible to optimize the use of cloud services without explicit manual intervention. In this way, the e-commerce websites don’t lose hits and they pay only for virtual machine instances that are needed to manage peak/non-peak business.

The third gear is the new software development culture— Development Operations (DevOps). Without DevOps, hassles of coordination, frequent deadlines, and operating at a scale would have been a massive challenge. With Microsoft Azure DevOps, unlike the past, the application development, quality assurance, and the operations team are all on the same page from the start of the project. This is an inevitable business practice. Further, the incorporation of microservices within Azure DevOps has infused necessary loose coupling and reduced dependencies. Distributed and centralized repositories have been witnessed to have a pronounced impact on software development practices. Similarly, Continuous Integration/Continuous Deployment pipelines have exponentially catalyzed the pace and frequency of delivery to the client. And finally, enterprise Kubernetes has enabled scaling and automating the deployment of containerized applications across clusters of virtual machines. These practices ensure high efficiency and consistency across development, testing, and production environments. Consequently, there has been an upsurge in the use of cloud technologies by techies during the pandemic.

In earlier days, the production team was restricted from deploying updates or patches once scheduled server reboot job was completed for the day. During the server reboot, specific software service remained unavailable at least once for a very short period daily. Also, after completion of the server reboot job, no further changes could be deployed on the live server on that particular day. This is now eliminated. Today, major e-commerce websites such as ‘flipkart.com’ and ‘amazon.in’ are available 24x7. Any changes on their websites/platforms happen without the loss of any traffic or the users ever realizing that changes have happened while they were browsing and adding products to their shopping cart. With the aforementioned gears, even during the pandemic, the IT industry continues to operate on a zero downtime mode. This implies that a software service must be available at all times.

Had it not been cloud services and technologies, work from home would have been a nightmare for the techies. Also, without the cloud, services commonly used by non-techies, such as virtual classrooms, office meetings, online entertainment, and social networking, would have collapsed due to demand at the national and global scales. Cloud technologies are continuously evolving. In the future, with declining cloud service costs, robust security, and strong data policies, the adoption of cloud technologies will surpass any estimates that we have today. As rural high-speed internet connectivity improves, a wave of cloud-enabled solutions will gradually disrupt life and business operations outside major cities. To feed India’s growing cloud appetite in the government, business, and civil society, nurturing a new talent pool and upskilling those who are already in the industry is vital. Also, to operate huge cloud data centers and other infrastructure, planning and executing sustainable energy policies and programs must become an intrinsic part of cloud businesses.

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