Project Design Phase – Part 2

Cloud Deployment

Team ID	NM2023TMID04427
Project Name	Project – Tracking Public Infrastructure And Toll Payments Using Blockchain

Scalability and Elasticity:

Scalability and elasticity are important elements in banking because FIs are witnessing tremendous growth in a short period of time and need to support multiple transactions and products/services offered. For example, faster payment systems that provide near real-time settlement can handle thousands of transactions per second. However, peak transaction processing happens only for a small fraction of the total running time, so the additional resources are utilised during this time only. Hence, system needs to be more elastic and optimise resources to meet this tremendous growth. Although scalability and elasticity can be achieved with the on-premise model through installation of new servers and host location, this is a very costly and lengthy process with no scope for resource optimisation.

Agility and Managing Speed of Change:

The volume of transactions is increasing at an average compound annual growth rate (CAGR) of 23%.1 The launch of new and innovative payment products like Unified Payments Interface (UPI), National Electronic Toll Collection (NETC) and Bharat Bill Pay Service (BBPS) has firmly placed the digital payment industry on an upward growth trajectory. Moreover, payment systems are being augmented due to trending technologies such as artificial intelligence (AI)/machine learning (ML), containerisation, blockchain and open-source project management platforms. These offerings can enhance the quality of deployment as well as the productivity of the overall system.

High Capex Cost:

Capital expenditure is higher in the in on-premise model as expenses are borne for a marginally longer period of time. These expenses include storage requirements, infrastructure maintenance, cost of upgrade, electricity cost and software/hardware costs. Moreover, a business needs to develop a strategic capex model because if it doesn't invest enough, its computing capabilities will be limited. On the other hand, if it invests too much and does not utilise the capacity fully, it ends up paying for the installation and maintenance of excess services.

Benefits of Migration to Cloud

Resilience and Scalability:

Cloud computing allows a business to scale up its infrastructure to meet demand without having to invest in costly redundant capacity. A business can utilise any number of resources on demand as per its requirements because the cloud system allows the utilisation of services on a pay-per-use basis. This will make the system more elastic, and the resources can be optimised effortlessly as well.

Agility and Faster Upgrade:

As discussed earlier, the payment system is growing along with modernisation due to evolving technologies. This requires the payment infrastructure to be upgraded, regardless of whether this is done on cloud or on premise. There are several other changes being adopted by FIs like change in payment architecture, renewing RTGS for high-value payments and migrating to ISO 20022. These changes can be achieved with cloud as it enables provision or de-provision of any service in a few minutes unlike the on-premise system wherein implementing changes can take a few days to months.

Low Capex Cost:

Unlike the on-premise model, the capex costs in the cloud model are designed for a shorter duration. The offered services can be accessed at any point of time in the business cycle on a pay-per-use basis, even if these services were not opted for the time of installation. Hence, it eliminates the issue of redundant resources while optimising cost.

- **On-soil cloud:** In the case of on-soil cloud the concept of data sovereignty applies, i.e. the data is subject to the laws and regulatory guidelines of the country. So, the cloud set-up needs to be within the country in this kind of infrastructure deployment.
- **Global cloud:** The data can be extended across borders. So, the cloud set-up can be at different geographical areas and accessed through the internet.

Migration Process:

Depending on the scale of business and number of applications, there are three standardised migration processes.

a. Big bang migration: It's the process of migrating existing physical payment infrastructure (apps, data and settings) to cloud. The ultimate result of this migration is the same infrastructure that employees are familiar with, but it is now hosted on cloud. Because their IT systems are not as vast as those of companies, small and middle-sized banks frequently opt for full migration. The execution usually takes a few days and is relatively risk free. The drawback of this approach is that not all cloud features are available. This is suitable for small-scale business as the entire data will be migrated in one operation.

b. Parallel migration: Also known as the module-wise approach, it involves moving only a portion of the payment systems and data to cloud. This is a good option to evaluate cloud services. Large banks usually adopt this method.

c. Partial migration: It refers to the ability to continue using the current payment method while migrating to cloud. This is also known as the hybrid approach. The unique aspect of this migration method is that organisations will have to maintain two systems at the same time. This approach can be adopted by both small- and large-scale companies.