The Hitchhiker's Guide To Metaversing on Snowflake
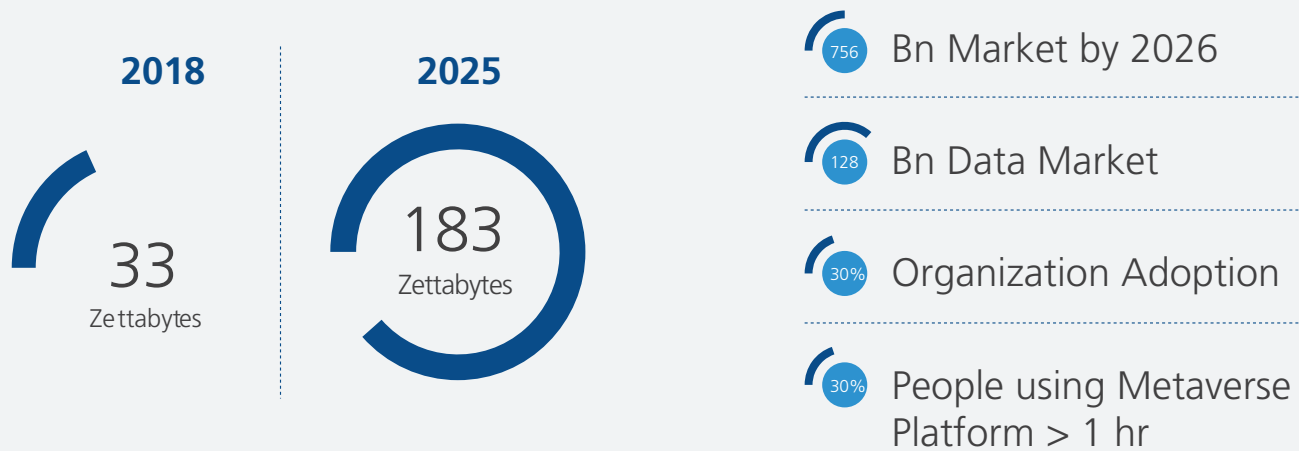
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Introduction

The greatest shape-shifting news at the end of 2021 in the technology world was the rebranding of Facebook to Meta. It introduced the world to a shiny new version of the internet called "Metaverse", a portmanteau of words - Meta (beyond) and verse (universe). Metaverse brings the need for huge computation power and a never-before estimate of data that has to be processed, resulting in a snowballing need for a Data Platform that can handle this "biggest data". Could Snowflake be that "Knight in shining armor" that could truly disrupt this technology? Let's dive deeper to understand the possibilities.

Since its inception, Metaverse has stirred the imagination and possibilities of several B2B initiatives, from selling products with extreme immersive experiences to new-age marketing techniques that could disseminate current social media approaches. The Metaverse will also see considerably increased user interaction than cell phones or present social media due to the sheer convenience it will bring to life.

2018

2025

33
Zettabytes

183
Zettabytes

756 Bn Market by 2026

128 Bn Data Market

30% Organization Adoption

30% People using Metaverse Platform > 1 hr

Source: Statistica Digital Compass - in 2018, the world generated 33 zettabytes of data and is predicted to reach 181 zettabytes by 2025. The metaverse would further bolster these estimates.

Therefore, it is reasonable to assume that it will generate huge volumes of data possibly in the range of zettabytes, a fact confirmed by Intel that the metaverse platform, used by a billion users, would require 1,000 times the computational efficiency we have today.

Yet to understand how truly disruptive the Metaverse can be, let's look at some data. Conservatively, based on our LTIMindtree's Market Research Bureau estimates, Metaverse would command a market revenue of staggering proportions - **$758.6 billion by 2026** with **"data products" raking in an estimated $128 billion of new business.**

View Gartner Reference Report

Further, Gartner states that 30% of organizations in the world would have metaverse-ready products and services by 2026.

View Gartner Reference Report

With a little over 3½ years remaining, it is but a tall order and an incredible opportunity to generate a new line of revenue stream. The world will change too – it's estimated that 25% will spend at least 1hr/ day in the metaverse universe.

> **Metaverse is going to be far more pervasive and powerful than anything else. If one central company gains control of this, it will become more powerful than any government and be a god on Earth.**
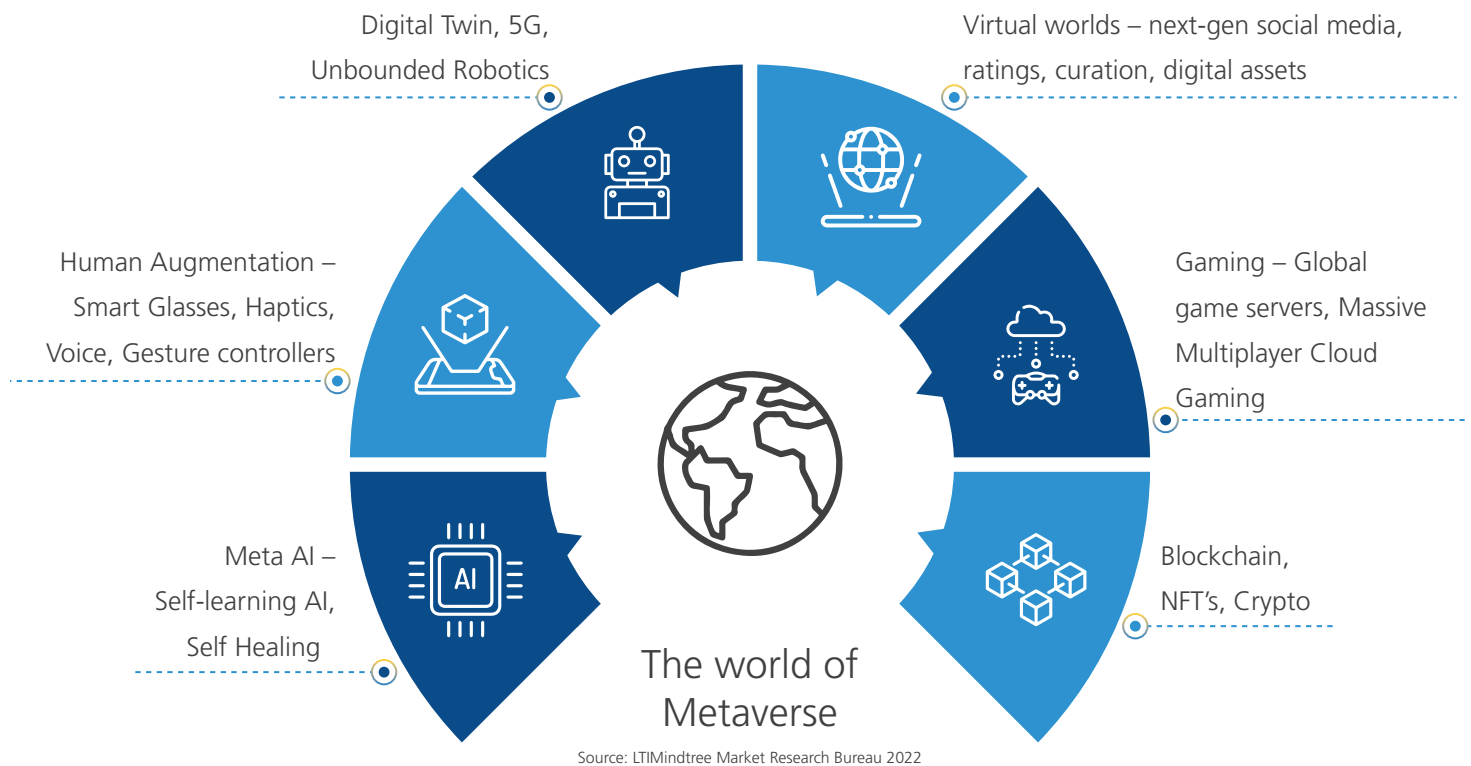>
> — Tim Sweeney, CEO, Epic

The Metaverse Etymology

Before we jump into the topic of Snowflake and Metaverse, let's take a sneak peek into this groundbreaking technology. At the core, Metaverse represents a highly interactive three-dimensional virtual world as immersive as the real world. Users can use a virtual avatar to perform tasks, explore places, and interact with friends and strangers. These avatars are replicas of the user that can do everything a human can in the real world. Metaverse is a blurred amplification of our real world and as the AR glasses, AR, and VR are the portal to the next wave of computing — spatial computing.

Digital Twin, 5G, Unbounded Robotics

Virtual worlds – next-gen social media, ratings, curation, digital assets

Human Augmentation – Smart Glasses, Haptics, Voice, Gesture controllers

Gaming – Global game servers, Massive Multiplayer Cloud Gaming

Meta AI – Self-learning AI, Self Healing

Blockchain, NFT's, Crypto

The world of Metaverse

Source: LTIMindtree Market Research Bureau 2022

It's where digital avatars, digital representations of ourselves, and the physical world intermingle to form a new reality. It's already happening with mixed reality and spatial computing headsets, social media AR filters, and lenses, and Google Maps Live View. One thing the pandemic has shown us is that our lives are becoming more digitized and virtualized. Further, Metaverse is a Blockchain-driven ecosystem that bolsters blockchain technologies such as Non-Fungible Tokens (NFTs) and cryptocurrency.
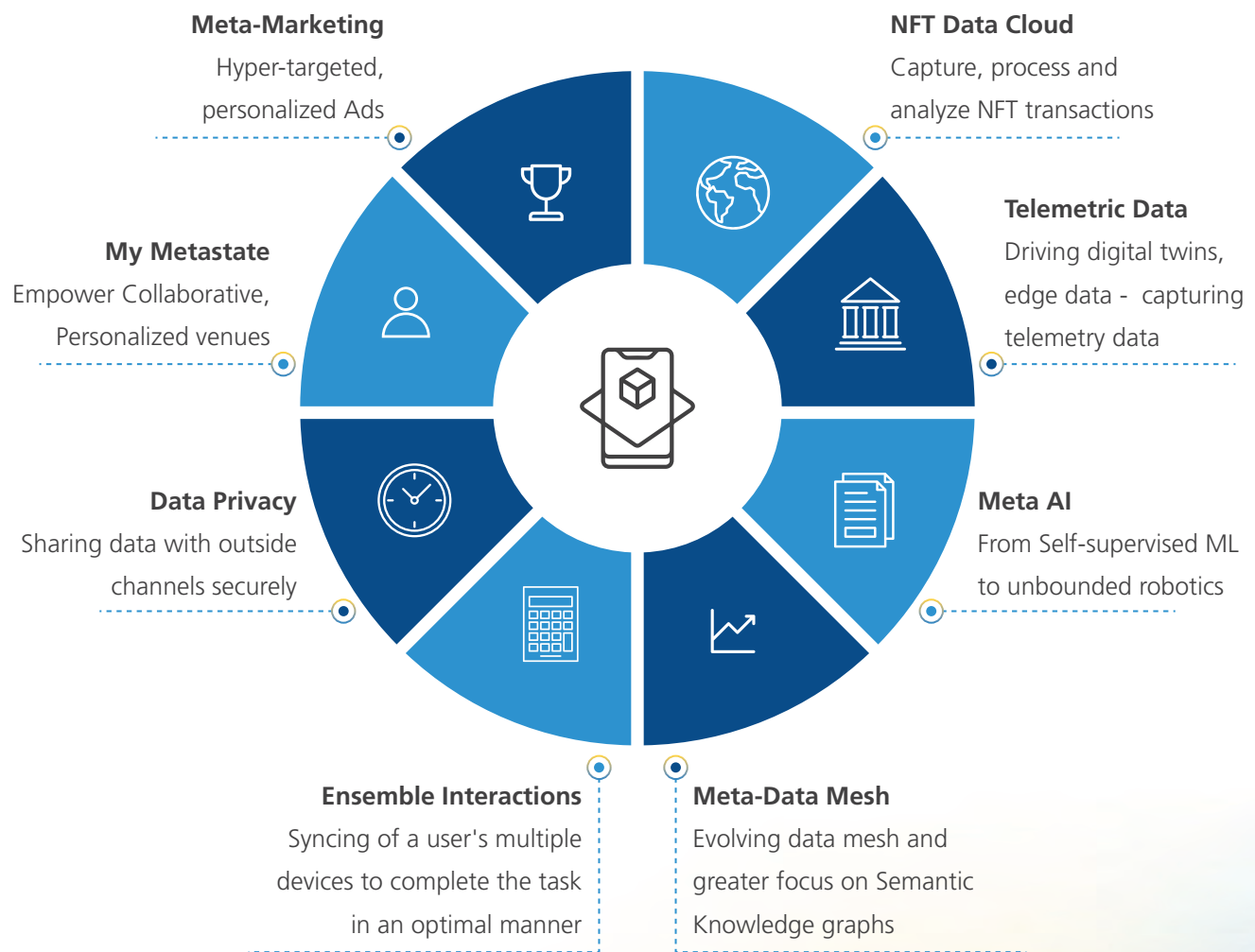
The Data Metamorphosis

Dive deeper and one would realize that Data is "the oil" that powers this universe. Several interesting use cases immediately spring up with the advent of the Metaverse.

At LTIMindtree, we have been following this "mega-trend", but what interested us the most were the data-related use cases and the art of possibilities. Metaverse will drive several use cases on data. For a start, massive amounts of organized, semi-organized, and unstructured data will need to be ingested and processed in real-time. It would also drive the need for a next-generation cloud data platform that can collect and process internal and third-party data with a single point of access to reduce the time it takes to search for insights. A platform like Snowflake could play a pivotal role in this design. Let's explore how.

Could Snowflake be the ideal candidate to solve these interesting Metaverse Use-cases?

Meta-Marketing
Hyper-targeted, personalized Ads

NFT Data Cloud
Capture, process and analyze NFT transactions

My Metastate
Empower Collaborative, Personalized venues

Telemetric Data
Driving digital twins, edge data - capturing telemetry data

Data Privacy
Sharing data with outside channels securely

Meta AI
From Self-supervised ML to unbounded robotics

Ensemble Interactions
Syncing of a user's multiple devices to complete the task in an optimal manner

Meta-Data Mesh
Evolving data mesh and greater focus on Semantic Knowledge graphs

Source: LTIMindtree Market Research Bureau 2022

Metaverse Use Cases	Impact	Why Snowflake is an Ideal Candidate?
Meta-Marketing – from immersive experiences to ambient ads that are no longer banner or display ads, but a real-life-looking celebrity virtual avatars promoting a brand.	◔	• Consolidate, aggregate, and process massive data sets that provide insights into user buying patterns from Metaverse and third-party systems. • Understand how users are engaging with products– cross-sell and upsell services, improve their product knowledge, and trigger personalized engagements. • Perform large workloads and run new technologies such as AI and machine learning on a stable, performant data Infrastructure.
My Metastate – from immersive experiences to ambient ads that are no longer banner or display ads, but a real-life-looking celebrity virtual avatars promoting a brand.	●	• Support high availability, and failover and combine real-time user data feeds and integrate them with other third-party data feeds to create a 720-degree view of the user. • Leverage a modern data infrastructure that eliminates data silos, consolidates granular data at one location, and generates insights. • Ability to perform advanced analytics, and predictive modeling to better understand user preferences, and improve user lifetime value.
Data Privacy – sharing data with outside channels in a safe and secure manner for marketing or diagnosis and providing support.	●	• Ensure data is safe through dynamic data masking and end-to-end encryption for data in transit and at rest. • Ability to govern data from a single, secure location. • Ability to protect data through encryption, time travel, and fail-safe. • Need for a modern data infrastructure that can comply with compliance, security, and privacy.

Metaverse Use Cases	Impact	Why Snowflake is an Ideal Candidate?
Ensemble Interactions – Deliver the same quality of service as users switch across devices.	◖	• Capture device information, process, and optimize viewing experiences as users switch devices. • Enable support for multitasking and collaboration by providing insights into the next best action or predicting user behavior and performing the task autonomously.
NFT Data Cloud – NFT Data Clouds hold massive information that help better understand cross-marketplace price information, NFT liquidity stats, and Metaverse real estate intelligence.	●	• Circumvent traditional performance issues of blockchain and store user information in Snowflake and reference it to Ethereum blockchain through encode pointers and smart contracts used to locate and authenticate to record locations. • Expand using solutions like Sonarverse, which provides a crypto dataset of blocks, transactions, token transfers, tokens, logs, receipts, and contracts. • Perform insightful analytics, and discover actions by providing native integration with analytical visualization tools to empower BI users to better.
Telemetric Data – Digital twin that requires scanned objects to be incorporated with real metadata and live data feeds through IoT sensors.	◔	• Ability to ingest massive and diverse data sets from AR/VR headsets. • Support for streaming and non-streaming data pipelines. • Building data analytics applications for actionable insights. • In-grained security and governance tools to ensure that sensitive data is maintained and archived.

Metaverse Use Cases	Impact	Why Snowflake is an Ideal Candidate?
Meta AI – embodiment and unbounded robotics, creativity, and self-supervised learning. Understanding multiple modalities at the same time.	◔	• Act as a source for generating combinations of millions of synthetic data that can drive self-supervised learning. • Inject live predictive scores in real-time by using a connected process through a machine learning feedback loop. • Delivering high performance to support robust ML models. In-built capabilities to scale up or scale down. It can also bear the data preparation responsibilities, reducing data-related burdens from machine learning tools.
Meta-Data Mesh – distributed architecture, semantic knowledge graphs.	●	• Moving from monolithic design to interconnected loops and a mesh pipeline. • Data-as-a-product with in-grained self-service and self-healing infrastructure (zero maintenance). • Federated governance with support for global and regional policies (E.g., GDPR in Europe).

The Uber ride to Dataverse

Whilst there is strong evidence that Snowflake's Data Cloud can address several use cases, the role of a System Integration partner like LTIMindtree becomes of paramount importance. To build a metaverse-compliant Cloud Data platform, would be no mean feat. Snowflake's strength comes from the fact that it is an extremely flexible architecture. At LTIMindtree, we believe there are several areas Snowflake can capitalize on with the support of a partner like LTIMindtree.

Few areas that Snowflake can look at as potential opportunities are:

- Current designs for Metaverse are looking for decentralized storage – Blockchain-inherent limitations compromise security over performance, Integrating Snowflake into the Blockchain database can help mitigate this problem.

- Proving one's identity in a virtual world has been a challenge. In Metaverse, it could be fatal. Security research in areas like Proxemics and Ubiquitous authentication could mean the system learns about a person from his behavior, the way he walks in real life, and his actions and uses this to authenticate a person to Metaverse. Such a system could require voluminous data to be captured, stored and insights derived. LTIMindtree has been driving initial strides in this space and can be a great opportunity to collaborate.

- Metaverse brings a whole new set of data formats, from multi-lingual speech records, and video files in 16K (and possibly higher resolution), to augmented reality objects which require to be stored and processed. This could again be an opportunity for Snowflake to collaborate with a partner like LTIMindtree.

- Industry-specific use cases, from building customer 720 use cases for banks to delivering NFT-enabled E-commerce solution for retailers that helps analyze NFT sales in real-time, to solving telemedicine or even performing hypnotherapy to alleviate stress could be fantastic use cases to consider.

Closing Views

In the movie Ready Player One, we were introduced to this fascinating world of Oasis. It was by far, an amazing preview into what the future holds for us. Metaverse brings a fresh perspective to data such as how data sharing will create a healthy ecosystem, or how Blockchain databases can co-exist with a Cloud Data platform such as Snowflake.

Metaverse will deliver breathtaking experiences through the usage of big data analytics that will allow teams to have a cloud data platform that can collect and process internal and third-party data with a single point of access to reduce the time taken to search for insights. Further, it will have the option to deal with organized, semi-organized, and unstructured information, while likewise separating information storehouses and bringing together bits of knowledge to predict future results.

Finally, it might be too early to predict the future, but one thing is for sure: the Metaverse will change the future of doing business, and data will be at its heart.

About the Author

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Arvind Rajan is a futurist, who loves sci-fi movies and dabbles in futuristic tech and is one of the earliest technology bloggers in India starting way back in 2003. His recent interests are in Metaverse and building solutions around Metaverse. Arvind comes with 17+ years of experience having worked with several leaders and has over 3+ patents. He is a two-time HackerEarth awardee, an arctic cold vault contributor.