QUEPPELIN.COM: THE METAVERSE SOLUTIONING

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Abstract

Prafull Mathur was a creative person intensely interested in music. He was a chemical engineer and had started working in software. His initial job allowed him to develop algorithms in predictive analytics in the financial domain. His algorithms were showcased and appreciated at the Mobile World Congress, Barcelona 2011. This established the path for him to set up his venture and Queppelin was created in India in 2010. Prafull's brother and a dentist by profession, Pulkit Mathur also joined him. The core business of Queppelin was to provide services and infrastructure for AR/VR and metaverse-based solutions. In 2024 the company was profitable and had positive cash flows, there were associated with many multinationals that had outsourced their AR/VR and metaverse solutions to it. However, Prafull Mathur's creative streak resulted in the prospective launch of Vossle the AR/VR platform solution which was later spun off as an independent company. Prafull had many challenges facing him in Queppelin like the non-availability of skilled manpower in AI and immersive technology, and technology adoption and in the case of Vossle, he was facing a dilemma of whether to go directly to the customers or through channel partners. Each had its pros and cons.

INTRODUCTION

Prafulla graduated as a chemical engineer from MBM Engineering College, Jodhpur, India in 2005 and started work in the software domain. He hailed from a services background family which comprised professionals like doctors, engineers and administrative services His mother was also keen for him to continue in a stable job, however, Prafulla wanted to follow his dreams, and his mother supported him. Prafulla's brother Pulkit Mathur a dentist by profession also joined him in the venture. Pulkit was a dental surgeon at Rajdhani Hospital, he obtained a Bachelor of Dental Surgery from Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, India between 2004 and 2009. Before that, he attended Jaipuria Vidyalaya from 2000 to 2003, and St. Xavier's School, Jaipur from 1990 to 2000 (The Org, 2024).

Prafulla was a person with an artistic streak and was keenly interested in music. He wanted to create a music business and was also into releasing a record label. In his college days, he was a professional singer and also conducted a show in a premium hotel in Jaipur city of Rajasthan, India. He started working in London, creating the share projection algorithms for Lehman Brothers and then for Halifax Bank of Scotland. He worked in the domain of Data Analytics and Artificial Intelligence. This gave him an early start in the domain that too with the companies which had huge data lakes. He used large data sets to predict the fate of stocks and shares. His job was centred around the technology part of the Banking and Financial Services Industry. However true love of his life remained music and technology, he wanted to create something by combining the two. He had a music background as he used to perform professionally in college. He gave live performances in a five-star hotel in Jaipur, India. His show was from 9 pm to 1 am where he used to play the hard rock numbers. While in London he was researching about producing a record label, and he understood that this business was already obsolete it was because of the innovation in the music field due to companies that had brought forth the digitization of music like Napster. Two passions of his life were music and technology and he thought of combining the two. It was at this time that Prafulla researched that in India 80% of handsets were Java mobiles, 8%-10% were Android and less than 1% were iPhones. He studied that there was no music streaming capability on these devices. So he

created a platform by the name of Zephyr the Rock Music Hub and launched it in 2011 (Srikapardhi, 2011). The platform was launched under the banner of Queppelin. Queppelin's name was also derived from his inspiration for music i.e. Queen+Zeppelin, which indicated two famous rock bands Queen and Led Zeppelin of which Prafulla and Pulkit were die-hard fans (Queppelin.com, 2023a). It is important to highlight the difference between service and infrastructure-based solutions for AR/VR and metaverse-based applications.

Companies that were providing infrastructure for AR/VR and metaverse solutions were the devise providers and other ones were service providers that provided software to function on top of the infrastructure; the services provided were very domain-specific in this case it was music provisioning.

METHODOLOY

A qualitative approach was used. The data was collected through in-depth interviews and secondary data analysis. The founder was interviewed to understand the business, journey, challenges, competitive space and the dilemma. Basis the discussion the study is presented below.

DISCUSSION AND RESULTS

A detailed interview with co-founder Prafull Mathur led us to gather insights into the company's journey, Queppelin.com's positioning as a new-age business, customer segmentation, market analysis, financial health, and dilemma. The same are detailed in the following paragraphs.

The Journey

Queppelin was founded by Prafulla Mathur and Pulkit Mathur in 2011 and this marked their entrepreneurial journey. According to Prafulla the objective of the Zephyr platform was to reach all the Indian Rock music lovers and expand the horizon of progressive Indian music. They received more than 26,000 downloads within one week of launching the platform, because of which they were noticed by Oracle and showcased at the Mobile World Congress. He added that (Queppelin.com, 2023a) "Queppelin getting featured at the Mobile World Congress, Barcelona 2011, was the first step towards their endeavours in paving the path to mobile application development from India to the world.". They acquired global attention at the Mobile World Congress, and the same year, they won the Red Herring Asia awards in Hong Kong. Subsequently, many big brands onboarded them like Gaana.com (Gaana.com, 2023), Reliance BigFlix (Sandhya Dangwal, 2017), Facebook (Facebook.com, 2023), Times Of India (Times of India, 2023), etc (Queppelin.com, 2023a) Ganna.com paid Queppelin an upfront cost and also a cost to maintain the platform, the platform was white-labeled by Queppelin. Ganna.com was a success story for Queppelin where they clocked in more than 100 million active users. However, interest of Prafulla was more in AI, data analytics and AR/VR space, and since 2015 their key focus has been deep tech a.k.a the metaverse space. In the metaverse (Mystakidis, S. ,2022) space Queppelin had created their platform which was used by Tatas for launching a product line called Rivaah of their jewellery brand Tanishq, the platform was also used by Emirates NBD, Google, Facebook (Queppelin.com, 2023b).

The Positioning of New Age Business in 2024

In May 2024 new-age businesses (Berman, S. J., 2012) were based on technology-inspired innovative models. They were set up by technology experts showcasing deep dive into new and emerging technology-based applications. Such businesses were nimble and responsive to market demands quickly adapting to the business needs to stay afloat. New-age businesses were

user-driven and ready to integrate with the user environment. They were focused on inclusiveness, brand consciousness, data security and thought leadership.

Queppelin was strategically positioned as a new-age business with the founders conversant with emerging technology of AR/VR and metaverse. They had set up a business that expected to be quick to respond to the new requirements of the customers as they worked very closely with the users. They focused on inclusiveness through the use of technology and worked consciously towards helping the customers build their brand. In 2023 Queppelin democratized the space of AR and AI by creating a software as a service (SaaS) product called Vossle (Queppelin.com, 2023c). Vossle was a "cloud-based SaaS platform for businesses to build Augmented Reality Experiences without the hassle of coding" (Queppelin.com, 2023c). Creating a flexible distribution strategy for Vossle was expected to bring the product close to the users. It was used to fast-track brand growth through AR and AI-based user engagement, e-commerce and improving customer loyalty. Vossle could build different types of AR for businesses like image targets, virtual try-ons, world targets, and AR games. Vossle was created under the Queppelin umbrella and in 2023 Queppeling spun off Vossle as a separate company. Initial funding for Vossle was given by Queppelin.

The service and infrastructure-based (Rani, D., & Ranjan, R. K., 2014) solutions for AR/VR and metaverse applications were differentiated. The service-related offering of AR/VR and metaverse implied utilizing the service provided by solutions companies in such a manner that it was customized to meet the needs of application companies. This was through the concept of software as a service called SaaS. For example, Airbus used a software-based solution to check the parts for repair or replacement, Coca Coca-Cola used AR as a service to carry out routine audits in the bottling facilities. (K. Ravichandran, 2019) Vossle created by Queppelin was a SaaS platform.

The infrastructure required for experiencing AR/VR and metaverse-based solutions included laptops, smartphones, head-mounted displays, handheld devices, head-up displays, smart glasses and tablets with special graphic capabilities. These hardware devices were expected to support sensors and different types of input and output devices. Companies like Queppelin used these devices to create AR/VR and metaverse-related services for their clients. In case clients wanted to use the hardware to create their own AR/VR and metaverse Queppelin provided consulting for that business solution.

The last innovation in display technology was seen in 2007 when the world shifted to smartphones. Not much had changed in display till 2023 when AR was changing the canvas of display technology, through VR/XR headsets, mobile handsets and laptops. Display technologies had also crept into the billboards thereby altering the space completely and creating gaps to be filled by companies specializing in AR/VR.

Queppelin had targeted this gap and invested to create an infrastructure for deploying state of art displays. Their objective was to create building blocks, which businesses could use to create their customized displays. Prafulla was steering towards a business-to-business model.

Customer Segmentation

Queppelin has several success stories about associations with their client businesses (please refer to Table 1). Below are details of a few of their clients' success stories (Cooil, B., Aksoy, L., & Keiningham, T. L., 2008).

Unilever the parent company of Ponds, wanted to expand its customer base by engaging the millennials and Gen Z. So, they approached Queppelin for an AR marketing campaign.

(Queppelin.com, 2023d). Emirates NBD was "the largest banking group in the Middle East & Turkey (MENAT) region in terms of assets that gross over $200 Billion" and employed more than 9,000 people. Emirates NBD hired Queppelin to manifest their marketing strategies using AR, to showcase its presence on Instagram and other social media platforms (Queppelin.com, 2023e), to offer an appealing experience to the customers. Tanishq a premium jewelry chain from Tata Sons, launched their collection "Rivaah" on Metaverse created by Queppelin. Quepplein also created an AR-based virtual try-on for Tanishq (Queppelin.com, 2023f). Biogas Engineering Inc. was a "US-based international engineering, procurement, and construction company that set up turnkey biogas plants for their clients", Queppelin set up their digital twin using VR, which was used by them for training purposes (Queepelin.com, 2023g). Queppelin developed a digital store Apple for British Telecom, the store used VR and created an immersive shopping experience for its customers (Queppelin.com, 2023h).

Table 1: Weblinks of the customers and the Vossle applications

Customer company name	Web Links
Hindustan Unilever Ponds	https://www.hul.co.in/brands/ https://www.queppelin.com/case-studies/ponds-webar-game/ https://vossle.ai/our-work/ponds-d2c-webar-game/
Emirates NBD	https://www.emiratesnbd.com/en?&utm_source=paid-search&utm_medium=paidsearch&utm_campaign=srh_pure-brand_acq_wc_uae_apr-24_brand_em&utm_term=eng_all_&utm_content=res_1&gad_source=1&gclid=CjwKCAjwufq2BhAmEiwAnZqw8sA4L3PJfFRQB75F4VE-4CfFRC4g4-KiJqaFwUtSoP77US-LoLSpCRoCKJ8QAvD_BwE https://www.queppelin.com/case-studies/emirates-nbd-ar-filters/ https://vossle.ai/our-work/emirates-nbd/
Tata Tanishq	https://www.tanishq.co.in/ https://www.queppelin.com/case-studies/tanishq-metaverse-development/ https://vossle.ai/our-work/tanishq-try-on/

Thus, the type of customers Queppelin was dealing with wanted AR/VR technologies as a way to expand the business. The clients wanted metaverse-based solutions for their businesses either for marketing or training. Because most of the business processes could be commoditized Queppelin was considering Vossle as a solution to enable clients to independently develop their metaverse solutions including AR/VR. The customer segment they were considering was divided into two parts. One was the segment which wanted to use the metaverse solutions in their businesses, the other was the one which wanted to develop the metaverse as a solution for customized business processes. Quepplein aimed to create Vossle as a service for metaverse development. Ease of use of the service was key to the utilization of the same.

Market Analysis

"The metaverse was a digital reality that combined aspects of social media, online gaming, augmented reality, virtual reality, and cryptocurrencies to allow users to interact virtually"(Jean Folger et al , August 2022) .AR and VR were being used to complement each other in business, it had become key to the digital presence of businesses. These technologies were being used to strengthen business strategies in almost all domains like healthcare, entertainment, media, manufacturing, real estate, automotive, consumer goods, retail, etc as they could provide personalization to the customers, thereby generating a high probability of creating customer loyalty and retention. Also, AR/VR were being used in on-the-job training in niche domains like aerospace, oil and natural gas etc. Training processes in virtual reality which was also a metaverse space helped by saving 70% of the training costs as they did not need to hire trainers and make them travel across cities. Additionally, the cost associated with physical training

location identification and upkeep was being saved. The companies which were creating underlying infrastructure for such AR/VR-based applications in business were also benefiting from the deployment. The companies like Unity Technologies and Epic Games were functioning in this niche.

State of art technologies like 5G had become major reasons for the adoption of AR/VR. The gaming market was also a major application area of AR/VR technologies which provided an immersive gaming experience by incorporating digital information like audio, video, and data in a real-time environment. The AR/VR penetration had a clear uptick in metaverse applications. The Pokemon Go was one of the initial success stories in the augmented reality area, this led to many other applications in business. Companies like Pepperfry (Pepperfry.com, 2023), Flipkart (Flipkart.com, 2023), Lenskart (Lenskart.com, 2023), Zara (Zara.com, 2023) etc. have used augmented reality through the smartphone camera.

Virtual Reality on the other hand offered an immersive experience and needed sophisticated cameras and systems. These are being used in tourism and real estate. Many companies had created training processes in virtual reality which was also a metaverse space by saving 70% of the training costs as they did not need to hire trainers and make them travel across cities.

The global AR/VR market was valued at USD 22.6 billion in 2021 and was expected to reach USD 451.5 billion by 2030 growing at a CAGR of 38.5% annually. Asia Pacific region was leading in the application of AR/VR technologies with 34% market share in 2021(Binance Square, 2022). Key companies in the AR/VR space in 2024 are shown in Table 2.

The AR/VR space could be divided into companies dealing with hardware used in AR/VR and companies in the software space.

In software space Queppelin had identified primarily two kinds of requirements in the AR/VR domain, one was the companies that used metaverse to market their products, and the other was occupied by the companies which were creating metaverse-based products and services. In addition to this, they were also considering providing solutions with infrastructure or only as a shared service.

Queppelin had launched Vossle positioned as a self-serve product, which allowed businesses to create their own AR/VR experiences without reaching out to Queppelin. Vossle was a no-code platform and worked on the subscription model, which allowed subscribing businesses to create content in the AI engine and make the same available through the AR/VR platform for their customers thereby democratizing the process of AR/VR usage for display and metaverse. With a product like Vossle, Queppelin was targeting the gig economy where every professional could create an AR/VR-based product to promote their ideas, products and businesses. Vossle was created to provide AR/VR and metaverse services to businesses. Queppelin was on the other hand providing complete AR/VR and metaverse solutions including the infrastructure.

Along with Vossle, Queppelin also offered a full metaverse development suite. They had created the Tanishq metaverse on the same suite (Isabelle Crossly, 2022).

Table 2: Companies in AR/VR space through hardware and/or software

Company name	Key business	AR/VR applications areas
Meta Platforms	Social Media, Metaverse	VR- Meta Occulus Rift, Meta Occulus Quest-kind of headsets AR- Facebook AR studio
Sony Corporation	Audio/ Video electronics and IT products	Sony's PlayStation VR
HTC Corporation	Smart handheld devices like smartphones and tablets	VR headsets and VR software
Google	Software company, AI, Cloud Computing	AR initiatives- Google Glass and AR Core – software development initiative VR –Daydream and Google Cardboard
Microsoft Corporation	Software Company	AR- Microsoft's HoloLens VR - Mixed Reality
Apple Inc	Hardware and software	AR- ARKit
Magic Leap	Hardware and software	AR- Magic Leap One AR headset
Samsung Electronics	Hardware and software	AR - Bixby Vision. VR- Samsung Gear VR
Niantic	Software for AR/VR	Development of AR games- Pokemon Go, Ingress and Harry Potter: Wizards Unite.
Unity Technologies	Software for AR/VR	Known for creating immersive experiences and games

The technology space occupied by Queppelin was unique as even though Tata Sons owned Tata Consultancy Service (TCS.com, 2023), Which was an Information Technology consulting multinational and occupied the largest market share in software development and export, still Tanishq's metaverse was created by Queppelin. The unique feature of the Queppelin metaverse was that the users could interact with the same directly from laptops and mobile phones and no other special devices were required. Many technology companies were willing to acquire Queppelin to gain the skill set.

The broader economic and cultural context of India's emerging market landscape

India's emerging market landscape is shaped by a complex interplay of economic and cultural factors. The key elements are detailed below:

Economic Context: India has been one of the fastest-growing major economies in the world. With a large and young population, it has been able to achieve significant GDP growth and is an attractive destination for Foreign Direct Investment. There has been a clear shift towards digital economy-related initiatives in a bid to modernize and streamline the economic landscape. India has diversified from agricultural and other traditional businesses and the thrust towards IT and Business Process Outsourcing is evident. The thrust has brought forward several courses to create a pool of skilled labour. Infrastructure had been developed specifically for universities and colleges providing degree programs and training capsule courses for digital platforms. To sustain growth infrastructure development has also been a key agenda in this included both digital and physical infrastructure.

Cultural Context: India has been known for its cultural and linguistic diversity with multiple ethnic groups, languages, religions and traditions. The diversity also influences customer behaviours and business practices. India has a young population which is also getting rapidly urbanized thereby impacting consumption patterns.

The economic and cultural factors create a complex consumer market. India's tech-savvy young population and growing infrastructure support an innovation ecosystem. Many

technology-based startups thrive in this ecosystem contributing to the country's technology hub (Asianstudies.org, 2024).

Startup India is a platform created by the Government of India to "catalyse startup culture and build a strong and inclusive ecosystem for innovation and entrepreneurship in India" (Startup India, 2024). It is expected to help the start-ups with several regulatory compliances.

The Competitive Space

Queppelin had many players in the competitive space but they considered 8thwall (8thwall.com, 2023) a Silicon Valley-based company as one of the key competitors in the infrastructure space. It was acquired by Niantic in the year 2022 (Jay Peters, 2022) The objective of Ninatic acquiring 8thwall was to help companies develop augmented reality apps independently. This was also Queppelin's business which they were democratizing through Vossle. Queppelin also considered Zappar (Zappar.com, 2023) a London-based AR company as their close competitor in the web-based AR space. Prafulla detailed that their infrastructure and product business was captured in Vossle and their services business was encapsulated in Queppelin. Queppelin was able to generate the maximum revenue with a minimum number of employees. Apart from the competition in the deep tech market, Prafulla had adulation and aspirations for Unity Technologies a Silicon Valley-based company (Unity.com, 2023).. They provided a suite of products and services for customers with real-time 3D experiences using AR/VR and metaverse on mobile, laptops and the web. They had a large share of contribution to the display and gaming market with a market share of 28.01% (6sense.com, 2023). Table 3 shows Queppelin competition in services and their financial health

Table 3: Queppelin competition in services and their financial health (all figures in USD)

Details/ Company	Queppelin	Cisco Spaces (Cisco.com, 2023)	Robosoft Technologies (Robosoft.in, 2023)	Affle (Affle.com, 2023)	Purple (The Economic Times, 2023)
Founded	2010	2001	1996	2011	2012
Type	Privately held	Privately held	Privately held	Privately held	Privately held
Employees	100-150	100-250	1 k -5 k	100-250	100-250
Revenue	-	9.7 m	25.1 m	3.6 m	12 m
Funding	-	30.4 m	15.7 m	-	12 m

The Funding and Financial Health of Queppelin

Prafulla had raised funds for Queppelin in 2010 and again in 2011 (Radhika. P. Nair, 2013). Ever since the company had been able to sustain positive revenue flows. The employee strength of Queppelin was between 100 to 150. The annual revenue of Queppelin was upstream, it was evident that Queppelin had maintained promising financial health till June 2023.

The Dilemma

On the evening of May 10, 2023, Prafulla Mathur felt very tired as he had been in a day-long discussion with his brother, CEO, and co-founder of Queppelin, Pulkit Mathur, and their senior leadership team. They had been in business for thirteen years. Prafulla being a creative person was restless to take the business ahead. They had divided Queppelin's business into services and infrastructure. Though Queppelin had some good clients however the question that was bothering Prafull was whether the company would be able to scale itself financially and how should he position the product line for the same. How can they balance the need for scalable infrastructure to support business growth with maintaining cost-effective operations? How can they secure the necessary funding for growth and innovation while ensuring long-term financial

sustainability without over-relying on external funding? The new-age businesses which were purely digital needed to be positioned in such a way that domains and businesses that are not digitally aligned should be able to see value for themselves by associating with these businesses. Prafull and Pulkit needed to work out the options for sustaining their business. So many thoughts had crowded into Prafulla's mind that he decided to take the evening off and take up the discussion again in the subsequent meeting.

According to Zhang G et al (2022), with the rapid strides of augmented reality and virtual reality people's interest in the virtual world was heightened. They further articulate that with Facebook transitioning to Meta the interest in Metaverse was even more pertinent. Metaverse allowed people to live and function in the virtual and real-world parallelly. The Embodied Social Presence theory explains that users should be able to feel their presence along with societal presence in the metaverse. If in the virtual environment end user feels the presence of society they will interact much more with the businesses leading to flourishing businesses in the metaverse. To take advantage of contemporary technology like the metaverse all businesses were looking at organizations which could enable them to have a presence in the virtual world. For example, any automobile manufacturing business would –need to understand the relevance of metaverse, augmented reality and virtual reality in their business and, hence would need to touch base with organizations that could help them with the expertise. Queppelin.com was a new-age business-to-business proposition, thus needed to create a loosely connected system with other businesses to sustain. Prafull and Pulkit needed to identify strategies to keep their business afloat.

The Challenges

Prafulla had faced many challenges while setting up the company as he was trying to venture into a virgin territory. Initially, when he worked with Gaana.com, he was the pioneer in creating a streaming platform for Android phones, he moved on to newer domains for developing infrastructure and service applications on platforms like AR/VR and AI and again faced the challenge of technology adoption. Metaverse espousal was also a challenge for the businesses as they could not fathom the usage of new technology and visualize use cases for the same. Also, the availability of skilled manpower in the domain was a challenge. Prafulla always believed in hiring engineers and then training them on new technologies, as the technologies they worked on were so state of art that there were no specialized people available.

Prafulla had set up the business in 2011 and in 2023 he was faced with the challenge of expansion. Apart from providing services in the domain of metaverse, Queppelin had also created a product in infrastructure space as detailed above, called Vossle. Prafulla wanted to launch Vossle as a separate company and was raising funding for the same. This effort was expected to generate revenue for the founders. However, the challenge was what should be the expansion strategy, whether they should expand through channel partners or deal directly with the company. Implications of going with channel partners would have been getting into a relationship with a third which would have entailed sharing the profits. Also managing relationships would have implied costs and complexities. In case Vossle dealt directly with the customers their profits and goodwill would be easy to manage. Prafulla had based the business of Queppelin and Vossle on VR, metaverse augmented reality and artificial intelligence, this technology was still in a nascent stage. According to Gartner's product lifecycle, where metaverse was still in the first stage called 'innovation trigger' in 2022. In case the technology did not take off and make the 'slope of enlightenment (Radhika. P. Nair, 2013) all the business investments would go a waste.

CONCLUSION

Queppelin was a new-age business in 2024 in the space of augmented reality, virtual reality, and metaverse. The market space they were targeting was the companies that were non-technology companies and wanted to have a presence in the virtual world. Companies wanted to explore the metaverse for marketing, training, and other needs. Queppelin wanted to make the process of metaverse creation independently available to people so they launched Vossle. The key takeaways from discussing this case will be understanding - the context of new age businesses like Queppelin, product design, target customer, the differentiation between service and infrastructure-based solutions for AR/VR and metaverse applications, the versatility of metaverse and AR/VR as underlying technologies and the channels for disseminating technologies like metaverse. In 2024 metaverse was still an emerging technology, and Prafull was in a dilemma of expanding the Queppelin business financially while keeping the infrastructure scalable and operations cost-effective.

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