TU Delft STRATEGIC PRODUCT DESIGN

Towards More Meaningful And Superior Digital Experiences in Luxury Automotive

A roadmap for the introduction of a blockchain technology ecosystem considering the needs of evolving customers.

Master Thesis by Kyria Calamita

INTRODUCTION

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EXECUTIVE SUMMARY

The accelerated digitalization of daily interactions, significantly influenced by the Covid-19 pandemic, has rendered the digital realm a fundamental aspect of life across generations. This shift has led to a transformation in digital asset management, ownership, and trade. The introduction of blockchain technology, especially non-fungible tokens (NFTs), has initiated a new era where digital items are capable of scarcity and uniqueness—attributes previously exclusive to physical luxury goods.

In this light, the project investigates the convergence of blokchain technology with the luxury automotive sector, seeking to unlock the business potential for luxury Original Equipment Manufacturers (OEMs). Through creative trend research, emerging trends and developments have been identified, delineating the future landscape of luxury automotive. A strategic vision for luxury OEMs has been formulated, establishing a reference point for innovation and customer-centric product development.

The project has pinpointed four products, each embodying the promise to resonate with the evolving values of luxury consumers and to propel business growth. These products are central to a structured roadmap, which is segmented into three strategic horizons, guiding towards the envisioned future. Each horizon encompasses specific goals, in harmony with the progression and integration of these digital products.

The roadmap produced is a detailed blueprint for luxury automotive companies to contemplate the integration of blockchain technology with luxury experiences. The report concludes with an evaluation of the products and the roadmap by luxury automotive professionals, and suggestions for further research to refine the strategic approach. This comprehensive evaluation encapsulates the project's full scope and its approach to aid luxury automotive towards more meaningful and superior digital experiences.

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GLOSSARY

- NFT: Non-Fungible Token
- OEM: Original Equipment Manufacturers
- ODCF: On-Demand Car Feature
- OTA: Over-The-Air
- SDV: Software-Defined Vehicle

2. IDEA MAPPING

3. PATHWAY MAPPING

4. CONCLUSION

Project Introduction

This first chapter gives an introduction to the project, its aim, and it explains the project approach.

It's the 21st century, and today, a significant portion of our daily interactions take place digitally. This digitalization has further intensified due to the Covid-19 health crisis in recent years. Advances in technology and digital experiences have made the digital world crucial in our everyday lives, reaching across all generations, and it seems we are heading towards even greater adoption in the future. The idea of being immersed in a digital world shouldn't be shocking; it is a reality we already experience: we carry our smartphones 24/7, staying connected and communicating in a virtual world. Therefore, envisioning an even more digital future, in line with advancements in extended reality (augmented reality, virtual reality, etc.), spatial computing, non-fungible tokens (NFTs), and artificial intelligence, seems a natural progression.

In the digital sphere, virtual items have almost always lacked scarcity or uniqueness, except in specific instances like games. However, it's important to note that in gaming, users do not truly own the assets and cannot use the digital items outside of the game. In 2020, global gaming audiences spent an approximate $54 billion on additional in-game content (Statista, 2021). Yet, the actual value of all these items is essentially zero: users don't truly own them, as they can't resell them. But blockchain technology, notably in the form of non-fungible tokens (NFTs), has altered the way digital assets function, exist, and enable the ownership of unique virtual goods. These NFTs have added more weight and importance to the digital realm by providing uniqueness and scarcity among its typical replicability.

Such characteristics of singularity and scarcity are easily found in many traditional "tangible" goods, especially in luxury goods: items that are scarce and not accessible to everyone, making their owners stand out. Until the emergence of NFTs, transferring these characteristics to the digital realm was impossible. Now, there is the possibility of incorporating such special attributes into the virtual context.

Within the luxury sector, this project will focus on a specific subsection: automotive. Among the industries that NFTs have catered to, the art and luxury fashion industries have gained significant popularity and found applications in many projects. However, the automotive sector seems less explored.

I have chosen to focus on automotive because it is an agent of change, with shifts towards electrification, autonomous driving, digitization, and ridesharing (McKinsey, 2020).

Blockchain technology offers an opportunity to provide innovation and added value to luxury automotive companies and their buyers. Indeed, this project aims to examine the business potential of this technology for the luxury automotive sector. The project's deliverable is a roadmap that helps luxury automotive professionals (in areas like innovation, strategy, connectivity, etc.) understand how a luxury OEM could integrate blockchain technology into their strategy.

The primary questions this project seeks to address are:

1. What could a future context look like, considering changes in luxury automotive, NFTs, and the Metaverse*?
2. What could be the added values that luxury brands give to their customers through the use of blockchain technology trends?
3. In relation to these added values, what would an integrated strategy look like in a roadmap?

*The Metaverse is considered the successor to mobile internet: "An expansive network of persistent, real-time rendered 3D worlds and simulations that support continuity of identity, objects, history, payments, and entitlements, and can be experienced synchronously by an effectively unlimited number of users, each with an individual sense of presence". The inclusion of the Metaverse in the project is pivotal for envisioning the future of the luxury automotive industry in a rapidly evolving digital landscape. It offers insights into innovative customer engagement and emerging markets, reflecting shifts in consumer behavior towards immersive digital experiences. Integrating the Metaverse aligns with exploring how blockchain and NFTs can enhance brand value and create unique experiences.

Project Approach

To provide a future-projected roadmap, the chosen methodology is design roadmapping by L. Simonse (2017): from value mapping, to idea mapping, to pathway mapping. This method addresses future-oriented strategic challenges or objectives. By synthesizing trends and technological developments, values and ideas converge in time-paced horizons.

The first chapter (value mapping) focuses on identifying the company's and the future customer's values (delivered as the future vision and persona), enabling the second chapter (idea mapping) to generate ideas connected to these values (delivering the products). This leads to the third chapter (pathway mapping), which details an implementation path (delivered as the roadmap).

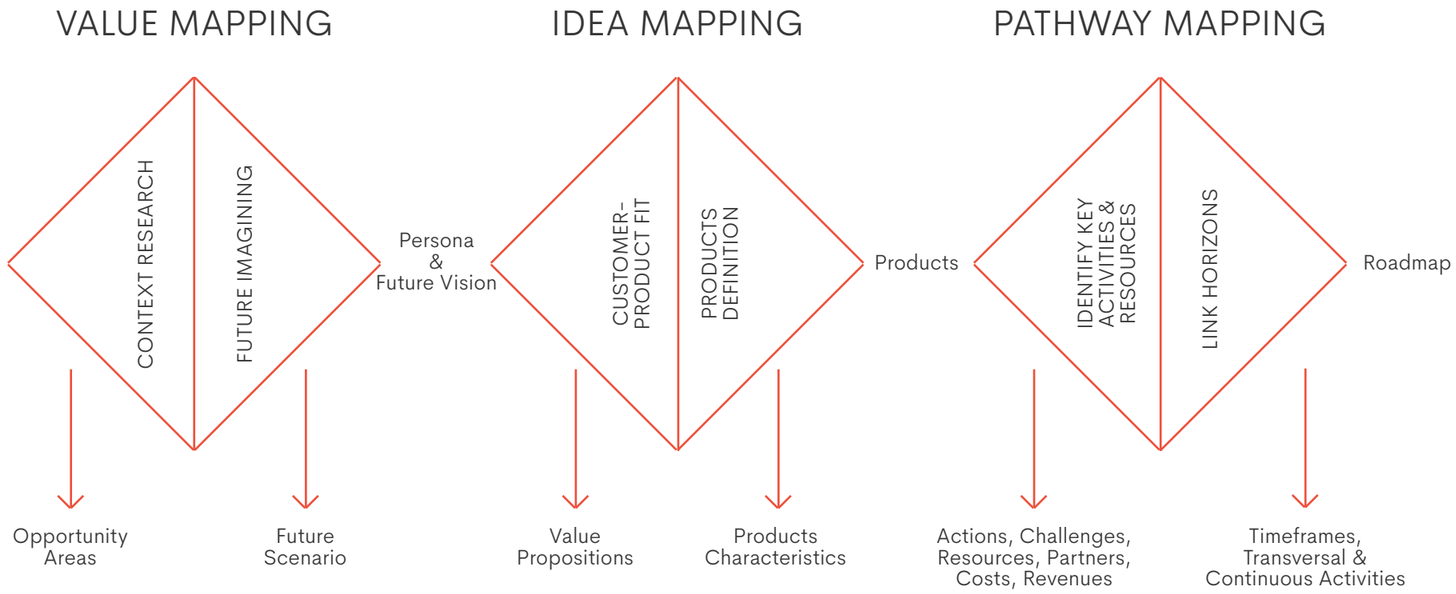
The **value mapping** section synthesizes context research and future imagining. Its goal is to define the required (future) value for the luxury OEM and the future customer's values and characteristics. This step concludes with the creation of a future vision and a persona, the former serving as the strategic reference point for the roadmap, and the latter as the foundation for idea mapping.

For context research, a SWOT analysis and a journey map were used to understand the luxury automotive sector better and identify potential opportunities for NFTs and the Metaverse in future vision crafting and persona creation.
The future imagining part employed creative trend research and the trend scenario method by Simonse (2017). Starting with a DEPEST analysis, a scenario was created. This method was chosen because the roadmap is future-focused, and understanding future needs and developments is crucial for relevance. The trend scenario is then essential for building the persona and the future vision.

Building from the identified persona in the value mapping step, the **idea mapping** phase concentrates on determining new customer-product fits and defining related products. Indeed, the identified persona is used to discover matches with new products that can provide interesting opportunities for future business development. Customer-product fit is found through the use of the value proposition canvas, as it is employed to understand what products or services can address the needs and frustrations of the persona in a compelling way. The matches between the customer and the product are represented through value propositions, which are concise statements of the benefits that a company delivers to customers through its products or services. The idea mapping phase concludes with the definition of products, necessary for the next phase to identify requirements and build steps for the roadmap horizons.

In **pathway mapping**, starting from the defined products, the focus is on delivering the final roadmap. This involves creating an overview of major guidelines for implementing the identified products, outlined on a timeline divided into three horizons aimed at the future vision. This phase concludes with validation sessions conducted with experts from the luxury automotive sector to gather their thoughts and suggestions on the roadmap and the conceived products.
Tools used in pathway mapping include the identification of key activities and resources, outlined through a journey map and a business model canvas, based on the products defined in the idea mapping phase.
The outcome of this journey map includes delineating

actions, challenges, and establishing resources and partners. These foundational elements contribute to the subsequent construction of the business model canvas and the overall roadmap. The final step in pathway mapping is the generation and linking of horizons and their activities. Defined within a distinct timeframe and divided into three horizons, this step involves elaborating on the horizons and their thematic focus, identifying transversal and continuous activities across products and timeframes. The final roadmap thus stands as a strategic guide, encapsulating the synthesized essence of the envisioned products.



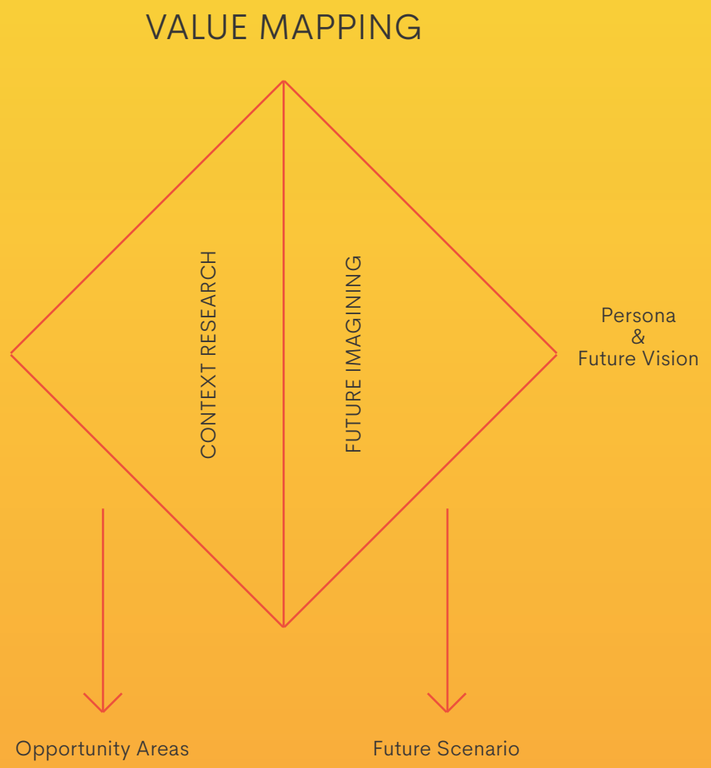
Project process showing the sub-results in each step

CHAPTER 1

Value Mapping

To get a clear understanding on the project's focus subjects, the value mapping part begins with thoroughlly exploring the context. The goal of this initial exploration is to get an understanding of NFTs, Metaverse, and Luxury Automotive, identifying possible opportunity areas to be used in the future vision crafting and persona creation (aka the outcomes of the value mapping part).
The next step in this part is identifying trends and building a future scenario, to understand the future needs and developments. If the goal of the first part (context research) was to get an understanding of the current context, the goal of this second part (future imagining) is to define the future context, identifying its trends and characteristics to be used in the future vision crafting and persona creation.

At the end of this chapter, an outline of the future vision and of the persona is delivered. The future vision will be the strategic reference point for the final roadmap delivery (in the pathway mapping phase), while the persona will serve as the foundation for the next phase of idea mapping.



1.1 Context Research

1.1.1 UNDERSTANDING NON-FUNGIBLE TOKENS (NFTs)

To start off, an introduction on the blockchain (Investopedia, 2022) should be made, as NFTs are based on this technology:

- Blockchain is a type of shared database that differs from a typical database in the way that it stores information; blockchains store data in blocks that are then linked together via cryptography.
- As new data comes in, it is entered into a fresh block. Once the block is filled with data, it is chained onto the previous block, which makes the data chained together in chronological order.
- Different types of information can be stored on a blockchain, but the most common use so far has been as a ledger for transactions.
- In Bitcoin's case, blockchain is used in a decentralized way so that no single person or group has control—rather, all users collectively retain control.
- Decentralized blockchains are immutable, which means that the data entered is irreversible. For Bitcoin, this means that transactions are permanently recorded and viewable to anyone.

NFTs at their core revolutionize and give new value to the digital ecosystem, enabling ownership and scarcity in an intangible and replicable domain.

It's essential to begin by clearly distinguishing between "**FUNGIBLE**" and "**NON-FUNGIBLE**" (figure 1).
A "fungible" asset pertains to something that can be substituted with another unit of the same asset without any substantial change. For instance, if you exchange one $10 bill for another, there's no real difference because they both represent the same value, regardless of ownership or condition.
In contrast, a non-fungible asset signifies something with a unique and non-interchangeable value. No two of these assets are exactly alike. Examples of non-fungible assets include houses, rare sports cards, or a piece of land.

An intriguing aspect of digital assets and files is their inherent replicability, as they can be copied countless times with a simple right-click or download action. Anyone can duplicate the same digital file, whether it's a photo, video, GIF, audio, or any other format. However,

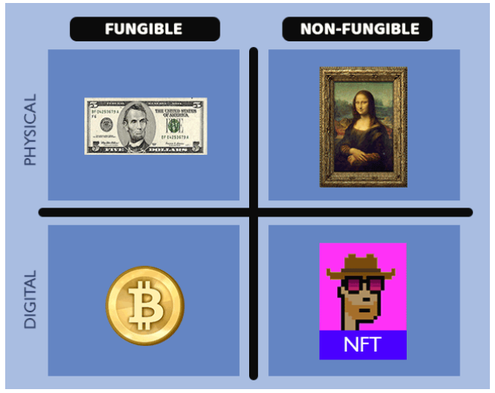


Figure 1, Fungible vs Non-fungible
Image: The Hustle, 2021

NFTs introduce a unique dimension by presenting something that challenges replication: ownership of the asset. NFTs grant digital items a distinct digital identity, achieved through blockchain technology. This transformation imparts digital items with qualities previously associated with physical goods, such as scarcity and exclusive ownership, effectively classifying them as tradable commodities (Canstar, 2022).
NFTs bridge the apparent paradox between scarcity and abundance, allowing digital content to embody

both qualities (The Hustle, 2021). Even when two assets appear identical, the embedded metadata in the non-fungible token serves as a hallmark of authenticity, distinguishing them from one another (Vaynerchuk, 2021). The NFTs' embedded metadata and transaction history are entirely verifiable by anyone with an internet connection worldwide. Consequently, anyone can access information about which digital wallets hold specific tokens at any given moment (One37pm, 2021).
The non-fungible token serves as a means to generate a digital certificate representing a unique asset. Virtually any form of digital content can be linked to these tokens, including photos, videos, digital art, collectibles, real estate, event tickets, tweets, and website domains. Through the creation of proof of authenticity for digital content, they can be owned, purchased, sold, and traded. (One37pm, 2021).

The foundational technology that facilitates the transfer of ownership for digital files is rooted in smart contracts. Smart contracts and NFTs are intricately linked, working in conjunction to redefine the notion of possessing and exchanging digital assets. NFTs empower the creation of digital art, while smart contracts furnish the functional framework for managing their ownership and transfer.
An NFT smart contract automates the execution of sales agreements and ownership rights for non-fungible tokens, all embedded within the code of the contract itself, which can even include provisions for royalties. These contracts, like the digital assets that they govern, are hosted on a blockchain, making them decentralized, transparent, and immutable (AI Multiple, 2023).

Some examples of digital collectibles sold since the boom of NFTs:

- ~$590k for a cat meme
- ~$1.5m for a pixelated drawing called "CryptoPunk"
- ~$3.6m for a custom song by the DJ 3LAU
- ~$6.6m for a 10-second video clip by the artist Beeple

These assets have sparked an explosion in interest that The Hustle dates back at 2017:

- 2017: NFTs first garnered widespread public attention with CryptoKitties, a game in which users breed and trade digital cats.
- 2018: A mini hype cycle led to VC-led investments, and platforms were created to buy, sell, and mint NFTs (like SuperRare, OpenSea, Rarible, and Nifty Gateway).
- 2019: Big brands like Formula 1 and Nike entered the space.
- 2020: The market for NFTs tripled in size, to $250m+.

Top NFT collectible sales in the past 30 days

February - March, 2021

Rank	Product	Category	Sales (30d)	% change*	# Trans.
1	NBA Top Shot	Sports	$251,725,854	432%	1,264,982
2	CryptoPunks	Art	$86,097,913	908%	2,144
3	Hashmasks	Art	$25,118,876	100%	5,558
4	Sorare	Sports	$11,588,197	400%	43,433
5	Art Blocks	Art	$7,843,263	940%	4,027
6	CryptoKitties	Collectible	$2,636,749	1846%	7,271
7	Axie Infinity	Gaming	$2,131,704	154%	7,620
8	Street Fighter	Gaming	$1,416,492	0%	206,691
9	F1 Delta Time	Gaming	$705,270	210%	193
10	Bitcoin Origins	Collectible	$334,942	43%	1,990

* % change over the last 30 days; DATA: Cryptoslam.io

THEHUSTLE

Figure 2, NFT collectible sales Feb-March 2021
Image: The Hustle, 2021

But in the first few months of 2021, there has been an NFT explosion (figure 2). In February 2021 alone, the 10 most popular NFT collectibles saw a 400% average MoM rise, totaling nearly $400m in sales volume (The Hustle, 2021). Bored Ape Yacht Club was one of the most popular NFTs of 2021, with some reaching a price of nearly $3 million. Many popular companies and public figures followed, with well-known brands such as Christie's and Nike launching their own NFTs, as well as releases by Tom Brady, Grimes, and Snoop Dogg.

Nevertheless, the question of "value" remains a subject of scrutiny. Objectively speaking, a video clip featuring LeBron James executing a dunk doesn't inherently hold a value of $208,000, and a cartoon cat shouldn't command a price tag of $100,000 or more. This observation holds true for physical collectibles as well. For instance, an original Hot Wheels car from the 1960s consists of materials worth just a few pennies, yet it can fetch prices upwards of $50,000 in the collector's market. Like many things in the world, the worth of an NFT is derived from extrinsic factors rather than intrinsic ones, as outlined by The Hustle (2021):

1. **Authenticity**: In contrast to physical collectibles, which employ various authentication mechanisms, the uniqueness and legitimacy of an NFT are securely recorded on the blockchain.
2. **Scarcity:** Numerous NFTs are unique or have limited availability.
3. **Transferability:** NFTs can be resold to a global audience, widening the pool of potential buyers.
4. Immutability: The code and metadata of an NFT cannot be altered, ensuring its enduring nature.
5. **Utility:** Certain NFTs can serve functional purposes, generate income, or be exchanged for tangible assets.

The Hustle attributes the 'NFT explosion' primarily to a single platform: Dapper Labs' NBA Top Shot, which was launched in October 2020 with the official backing of the basketball league. On this platform, users have the opportunity to acquire digital packs containing NFTs known as "moments," which consist of short video clips showcasing highlights from NBA games, such as memorable dunks or steals. Similar to physical trading cards, some moments are widespread (with over 1,000 copies in circulation), while others are exceptionally rare (limited to just one copy).

Experts at The Hustle argue that the rapid ascent of NFTs like Top Shot results from a convergence of several overarching trends:

1. The COVID-19 pandemic has intensified our engagement with virtual spaces, as more individuals worked from home and spent increased time in digital environments, leading to greater appreciation for the value of virtual goods and services.
2. The cryptocurrency market has experienced substantial growth, and a broader acceptance of the concept of decentralization has piqued interest in various digital assets.
3. Prominent institutions, such as Christie's auction house, have bolstered the credibility and prestige of NFTs by actively participating in this space.
4. Non-fungible assets often thrive during periods of economic instability, as seen with historical examples like rare coins, which witnessed price surges during the Great Depression, the stock market crash of 1987, and the 2008 recession.

Some **OPPORTUNITIES** for NFT integration:

- **Gaming Industry:** NFTs have found their place in the gaming industry, with games like CryptoKitties, Cryptocats, CryptoPunks, Meebits, Axie Infinity, Gods Unchanged, and TradeStars already featuring them. One intriguing aspect of these games is the "breeding" mechanism, allowing users to raise and breed virtual pets, including limited/rare editions that can be sold at high prices. NFTs also provide ownership records for in-game items, fostering economic marketplaces that benefit both developers and players. Developers who are NFT publishers of in-game features can earn royalties from secondary market sales, while players can acquire exclusive in-game items, creating a mutually advantageous business model (Q. Wang, R. Li, Q. Wang S. Chen, 2021).
- **Virtual Events:** In traditional event ticket markets,

consumers must trust third parties, leading to risks like purchasing fraudulent or canceled tickets. NFT-based tickets, on the other hand, are unique, scarce, and blockchain-issued, ensuring entitlement to event access. Smart contracts on the blockchain create transparent and efficient ticket trading platforms for event organizers and customers, eliminating the need for intermediaries (Q. Wang, R. Li, Q. Wang S. Chen, 2021).

- **Digital Collectibles:** Digital collectibles encompass various types, from trading cards and digital images to virtual real estate and domain names. For artists, NFTs offer a transformative platform to showcase their work with integrated identities, avoiding intermediary fees on social media platforms. NFTs enable artists to receive royalties from future sales of their digital artwork, benefiting platforms like SuperRare, MakersPlace, Rare Art Lab, and VIV3. Moreover, user-friendly platforms like Mintbase and Mintable facilitate the creation of NFT works by ordinary individuals (Q. Wang, R. Li, Q. Wang S. Chen, 2021).
- **Memberships:** NFT collectors envision expanding the use of tokens into the "real world." For example, NBA players may offer court-side seats and meet-and-greets in exchange for specific NFT moments. Certain NFTs grant real-world perks, such as access to high-end events, groups, or associations, based on the creators. NFTs, with their permanent transaction history on the blockchain, can serve as badges that verify membership in a group or attendance at an event. Users can collect and display these badges in their POAP NFT wallets, showcasing their experiences and affiliations (Future Today Institute, 2022).

BEYOND THE HYPE

Some critics have voiced skepticism, drawing parallels between NFTs and the hype-driven initial coin offering (ICO) bubble of 2017. They argue that the initial surge of buyers and sellers in the NFT space would eventually fall back, with only genuinely rare and desirable NFTs maintaining their value (The Hustle, 2021).
Notably, entrepreneur Gary Vaynerchuk (2021) has compared the early phase of NFTs, starting in late 2020, to the internet stocks of 1998-2000. He believed that oversupply would lead to the downfall of many NFT projects, even those that initially fetched high prices, but he predicted the NFT market's enduring presence. He drew a parallel to the dot-com bubble burst in March 2000. Vaynerchuk envisions a future where people routinely explore each other's digital wallets and bond over mutual NFT interests, much like social media accounts are commonplace for everyone.

Indeed, experts view NFTs as a technological breakthrough and a revolutionary development. In a TED Talk, technologist Kayvon Tehranian (2021) explained how **NFTs lay the foundation for the internet of the future** by empowering digital creators and advancing the internet's evolution.
He sees NFTs as the answer to the question that John Perry Barlow, one of the early internet pioneers, posed in 1992 on the World Wide Web, 3-years from its birth: "If our property can be infinitely reproduced and instantaneously distributed across the planet without cost, how are we going to protect it? How are we going to get paid for the work we do with our minds? And if we get paid, what will assure the continues creation and distribution of such work?".
Tehranian refers to concepts like property and ownership, which have been well-established in the physical world but have presented challenges in the digital realm. He highlights how the internet's dominant business model has been advertising, leading to free information but also enabling large corporations to control most of the value on the internet. Users generally don't receive compensation for their digital work, and their content often remains confined to the platforms they use. Until NFTs.

According to Tehranian, NFTs don't simply port our existing model of ownership from the physical world, indeed they improve it. In the physical world, ownership fences people out. It precludes others from enjoying what someone owns. Digital space, however, is expansive and NFTs offer a system of ownership that reflects this expansiveness. With NFTs, one's owning something doesn't preclude others from enjoying it. In fact, it's the opposite. The more an NFT is seen, appreciated and understood, the more possibility it has to increase in value.

Tehranian attributed this dynamic to the smart contracts' built-in royalty system, which can be programmable, simplifying what used to require extensive legal and manual labor. This innovation has significant implications for industries reliant on royalty payments, such as publishing and music. Just as blogs and MP3s transformed these industries in the past, NFTs are going to drive their next evolution.

Moreover, unlike the current internet where information is controlled by proprietary apps and platforms, NFTs are portable and exist on a decentralized, peer-to-peer, open, and transparent infrastructure. Over the next decade, NFTs are going to reshape the internet, embedding property rights into their code. Tehranian concluded his speech by envisioning an internet of the future where creators hold economic control, where users' ideas and creativity receive direct support, and where information can be free while users are rewarded for their intellectual contributions.

The hype surrounding NFTs that began in late 2020 was a bubble, as anticipated by many experts, and this bubble began deflating in late 2022 (The Art Newspaper, 2023). However, it's important to remember that NFTs are not solely speculative assets but also a valuable technology with the potential to bring significant advantages to various industries, which explains their continued relevance despite a decrease in trading volume.

WEB 3.0

In order to understand the whole context better, it is useful to look into Web 3.0. A brief history of the web, from version 1 to the third generation: FROM WEB 1.0 TO WEB 3.0 (figure 3)

Web1.0 (1990-2004) = largely read-only + open
Connected users online through static pages. The goal of Web 1.0, was to present content and products to consumers, much like a catalog.

Web 2.0 (2004-now) = read-write (& publish capabilities) + more centralized (this era consolidated market share among just a few big tech giants, which now hold a lot of power, leaving users at the whim of handful of companies, which a lot of people will sign up for because of convenience, ease of use, etc.)
Web 2.0 has connected users into online communities – the social media revolution has turned users into creators, but its users do not own much (aside maybe from a domain name), they are not in control of their own destiny, they have very few rights, and their reputation is not transferrable if they are on a platform like Twitter. Therefore, the core aspects of Web 2.0 are: interactivity, social connectivity, and user-generated content.

Web 3.0 = read-write-own + decentralization
Web 3.0 is built upon the core concepts of decentralization, openness, and greater user utility (Investopedia, 2022). Web 3.0 is the blockchain-integrated internet, one that takes in Web 2.0 but allows users to properly own the content and data they create (Cnet, 2022).
Conceptually, Web 3.0 is intended as a return to the decentralized iteration of the internet in which individual users have more autonomy and control of their privacy

and data through the use of blockchain technology to enable new types of transactions and authentication of ownership. Web 3.0 is the next step on a longer continuum, which enables broader computer-to-computer interactions over the internet and easier human-to-machine experiences (Future Today Institute, 2022).

Bloomberg has described Web 3.0 as an idea that "would build financial assets, in the form of tokens, into the inner workings of almost anything you do online". Some visions are based on the concept of decentralized autonomous organizations (DAOs). Decentralized finance (DeFi) is another key concept; in it, users exchange currency without bank or government involvement. Moreover, self-sovereign identity allows users to identify themselves without relying on an authentication system such as OAuth, in which a trusted party has to be reached in order to assess identity. Technology scholars have argued that Web 3.0 would likely run in tandem with Web 2.0 sites, with Web 2.0 sites likely adopting Web 3.0 technologies in order to keep their services relevant (Aakash, 2022).

Web 3.0 Definition

Web 3.0 represents the next iteration or phase of the evolution of the web/Internet. It is built using decentralized blockchains and upon the core concepts of decentralization, openness, and greater user utility (Investopedia, 2022). Therefore, Web3.0 is the internet owned by the builders and users, orchestrated with tokens (Packy McCormick, 2021)

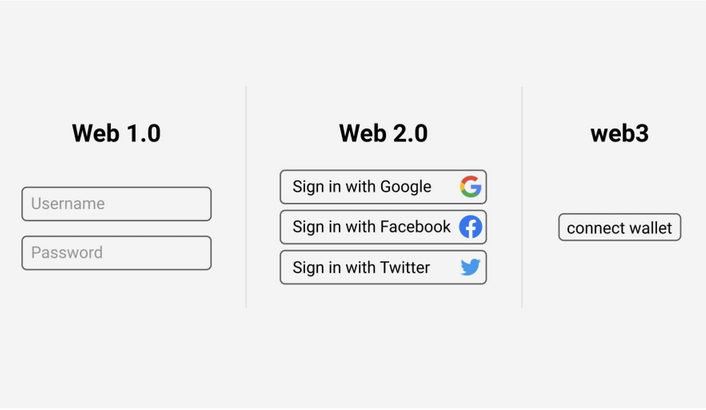


Figure 3, Web 1, 2, 3
Image: Varriale, 2022

1.1.2 UNDERSTANDING THE METAVERSE

> *"The Metaverse is a massively scaled and interoperable network of real-time rendered 3D virtual worlds which can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments" (Ball, 2021).*

The definition of Matthew Ball, an esteemed expert on the Metaverse, refers to an open metaverse, which supposes a wide range of different digital "worlds" that are all interconnected. Nonetheless, **the full vision of the Metaverse is decades away**. It requires extraordinary technical advancements (we are far from being able to produce shared, persistent simulations that millions of users synchronized in real-time), and perhaps regulatory involvement too. In addition, it will require overhauls in business policies, and changes to consumer behavior (Ball, 2021).
A practical example is at the moment users cannot authenticate once and have a continuous experience through different virtual worlds. The digital assets that the user owns in a virtual world, do not always "follow" him/her in another one – they are not interoperable. This brings to the concept of closed virtual worlds that are only accessible through a download of a proprietary source IP which users are required to sign an end-user license agreement to access. Video games like Fortnite, Roblox, Call of Duty, Minecraft, and League of Legends are all examples of closed virtual worlds. Regardless of what content is available within a closed metaverse, that content remains within (if content is company-made or if it's user-generated, it all remains within the single world). As of today, some platforms are based on blockchain, which allows users to actually own in-world assets. One example is Decentraland, a 3D virtual world based on the Ethereum blockchain.

With reference to the closed virtual worlds, Epic Games founder Tim Sweeney underlined an important aspect, back in 2017: "As we build up these platforms toward the Metaverse, if these platforms are locked down and controlled by these proprietary companies, they are going to have far more power over our lives, our private data, and our private interactions with other people than any platform in previous history" (Venture Beat, 2017).

The term "Metaverse" has gained significant recent popularity because we're witnessing its nascent emergence. This is one of the reasons why Fortnite and Roblox are frequently linked with the concept of the Metaverse. In a way similar to how the iPhone symbolized the advent of the mobile internet by encapsulating the innovations that propelled it into the mainstream, these 'games' bring together various technologies and trends to create an experience that is both tangible and distinctly different from anything that preceded it. However, it's important to clarify that these experiences, while significant, do not constitute the complete concept of the Metaverse (Ball, 2021).
When contemplating the concept of the metaverse, it's vital to acknowledge that the Metaverse isn't a game, a piece of hardware, or an online experience. It's like saying that World of Warcraft, the iPhone, or Google is the internet (Ball, 2020).

In its full vision, the Metaverse becomes the gateway to the majority of digital experiences, an integral component of physical experiences, and the next significant labor platform.

Matthew Ball (2021) characterizes the Metaverse as a "quasi-successor state to the mobile internet". Indeed, other experts like Larry Cheng, managing partner at Volition Capital, growth equity firm, explained that a person's current experience with their phone is considered "the beta version" of the Metaverse: "**The Metaverse will make the experience more immersive and you can actually own parts of the metaverse, you can transact in the metaverse, you can engage, you can play and you can work in the metaverse**" (Fox Business, 2022).

The metaverse is still in its nascent stages, yet there's one essential component without which it would remain incomplete: NFTs. They serve as the fundamental building blocks of the metaverse and play a pivotal role in unlocking its various dimensions. NFTs enable the ownership of portions of the internet, mirroring real-life ownership. As our digital and physical realms continue to blend, NFTs become a fundamental element for the metaverse, effectively transforming internet users into owners.
Within the convergence of the physical and digital realms, digital identities hold as much significance as their offline counterparts. Consequently, we are increasingly inclined to invest time and resources in shaping these digital identities, particularly when they are safeguarded from duplication. This is precisely where the qualities of ownership and uniqueness inherent in NFTs prove invaluable. When navigating the metaverse in a specific identity, the assurance of not encountering someone identical to us is paramount, much like avoiding a lookalike in the physical world. Just as we purchase clothing and accessories to create a unique style, in the future (as already partially happens with video game skins), we will buy digital elements certified by NFTs that will guarantee their value (Wired, 2021).

Moreover, the establishment of the metaverse relies heavily on the infrastructure of Web 3.0. Tokenization, proof of ownership, fluid financial transactions, and authentication of provenance—largely underpinned by blockchain technology—will propel the metaverse's development (Future Today Institute, 2022).

The metaverse represents the next iteration of the web's interface, transitioning from the mobile experience to a seamless realm of internet and digital interactions. Unlike NFTs, the metaverse isn't a technology in itself; rather, it represents how we will use technology and access the web in the next phase of the mobile internet, which is likely to be a three-dimensional (3D) experience. Indeed, a key aspect around the Metaverse is how the internet will be experienced: advances on Extended Reality (XR)* lead to an immersive experience. Indeed, Melanie Subin, director of consulting at the Future Today Institute, explained what to expect from the Metaverse: "It's going to be a digital overlay onto our physical world and I don't think that that's going to mean that we are going to walk around wearing a VR headset all day, so instead of having to pick up our phone and type something in every time we need it, we will have information that we need available at our fingertips and that could be through AR, that could be through holograms" (Fox Business, 2022).

*This umbrella term refers to all the immersive technologies: the ones we already have today—augmented reality (AR), virtual reality (VR), and mixed reality (MR) plus those that are still to be created (see figure 4). All immersive technologies extend the reality we experience by either blending the virtual and "real" worlds or by creating a fully immersive experience (Forbes, 2019). Extended reality (VR, AR, and BCI) technologies are emerging as the computing platforms for the metaverse (figure 5).

The metaverse is more that any single company, technology, or platform; it embodies a directional shift rather than a precisely defined concept. This trajectory toward the metaverse is evident in virtual worlds like Spatial in Meta Quest Horizon, the integration of virtual reality glasses, or augmented reality lenses on smartphones, which overlay digital layers onto the physical environment. It's the move from the two-dimensional (2D) internet to the 3D spatial internet, where individuals move from merely being "on" the internet to fully immersing themselves "in" the internet, with visual content surrounding their environment (Copenhagen Institute for Future Studies, 2022).

As of now, there are several projects/explorations being done around the metaverse that indicate the potential and desire to "make it happen". Nonetheless, the metaverse today is a work in progress. As an example, the technologies for its accessibility (VR, AR, haptics, brain-computer interfaces or also called BCIs...) and the functioning for a seamless experience (interoperability for example) are not yet at a mature and mass adoption stages.

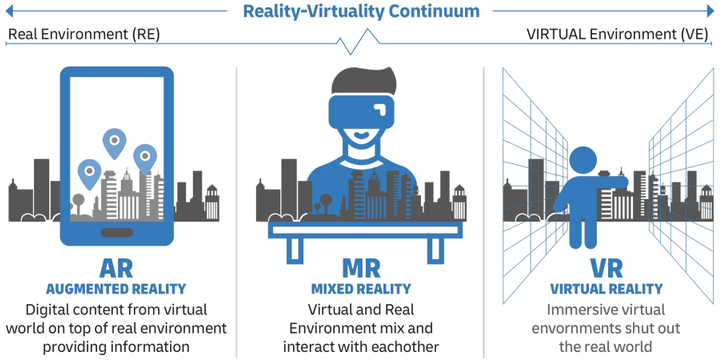


Figure 4, Differences between AR, MR, VR
Image: DHL, 2021

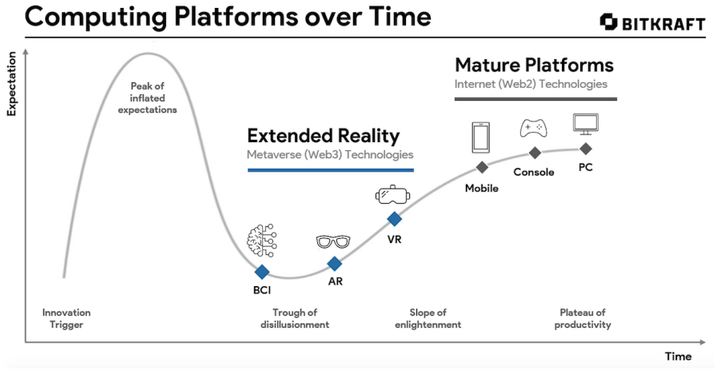


Figure 5, Computing platforms over time
Image: BITKRAFT Ventures (World Economic Forum, 2022)

1.1.3 UNDERSTANDING LUXURY AUTOMOTIVE

The term "luxury" refers to a vast variety of products ranging from the well-known fashion goods to more complex products such as private yachts, jets and vehicles. In such heterogeneous context, luxury automotive industry proved to be the leading sector in terms of overall value of the market.
However, despite the predominancy of the above-mentioned sector, there is an overall lack of studies and researches on the subject (S., Rezzano, F. Fallini, A. Braun, 2021).

Due to this lack of studies, this was asked to some experts from the luxury automotive industry (Costumer Insights Manager & Brand Manager), whom confirmed this event. The classification of the luxury automotive sector is private and sensitive information, that is why there is a lack of public information (companies pay external firms for data and information on the sector and its classification).
Nonetheless, a recent research project aimed at creating the ground base for further specific researches on luxury cars by, developing a list of features of the cars and user types that belong to the luxury automotive class (S., Rezzano, F. Fallini, A. Braun, 2021).

The key things that define luxury automotive (figure 6) are technical aspects (like the performance, craftmanship and premium quality of the luxury cars), innovation (like the innovative production used), uniqueness (like the personalization and limited edition of the luxury cars), brand origin (like the country of origin of the car/ brand and the results in competitions), and, last but not least, the social appeal (like the global reputation, the community belonging, and the embodiment of a lifestyle).

From this overview, it can be concluded that NFTs and the Metaverse resonate with the following characteristics of luxury automotive:

- Uniqueness recalls a characteristic of NFTs (1:1 NFTs)
- Innovation recalls NFTs and the Metaverse (new technologies and experiences with NFTs and the Metaverse)
- Social appeal recalls NFTs (NFTs can represent special assets as well as allow for token-gated accesses)

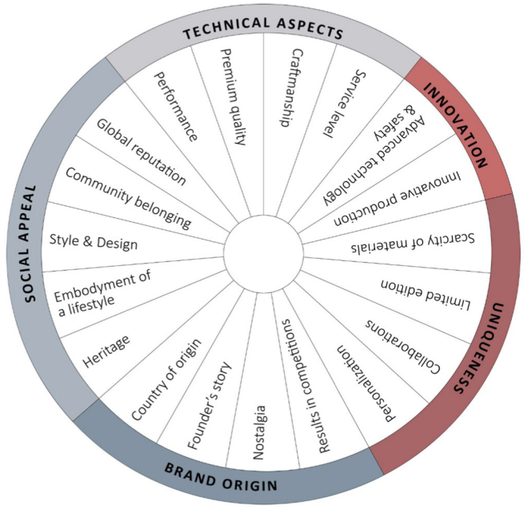


Figure 6, Model to define luxury automotive
Image: Rezzano, F. Fallini, A. Braun (2021)

- Brand origin recalls NFTs (the issuer and previous owners of an NFT are points of attention for NFTs)

Nonetheless, the strongest link between NFTs and luxury automotive is the ownership of unique assets (figure 7). Indeed, with NFTs, this ownership is now possible to be applied to the digital.

Moreover, as can be seen from figure 6, which depicts the types of customers from the categories that define luxury automotive (figure 8), it can be said that NFTs and the Metaverse have the potential to resonate with every type of luxury car customer.
As described by Rezzano et al. (2021), the five macro-clusters of customers with similar values and purchasing behavior are:

- Proud achievers: Individuals who are drawn to technical features but are also significantly influenced by social factors, displaying a tendency to seek social approval and conformity
- Visionaries: Clients who prioritize the innovative and technical aspects of their cars, placing high demands on elements such as the engine, driving experience, interior materials, infotainment, and Advanced Driver Assistance Systems, expecting top-notch performance and the latest technologies
- Enthusiasts: Customers in this category have a deep passion for the world of supercars and the legendary stories associated with manufacturers. While they value tangible aspects like quality and performance, they also consider car-related activities and services as highly relevant
- Exclusivity hunters: Owners of special luxury cars driven by the desire to own exclusive vehicles tailored to their personal taste, with the intention of standing out from others
- Collectors: Discerning customers who place significant importance on the brand's origin and the uniqueness of their car. Their vehicles may not be the latest models, but they symbolize a personal desire with a strong emotional connection and alignment with their values.

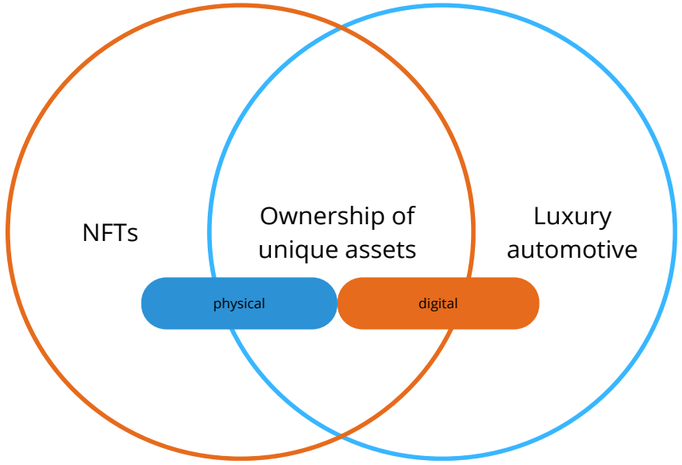


Figure 7, Commonality among NFTs and Luxury automotive

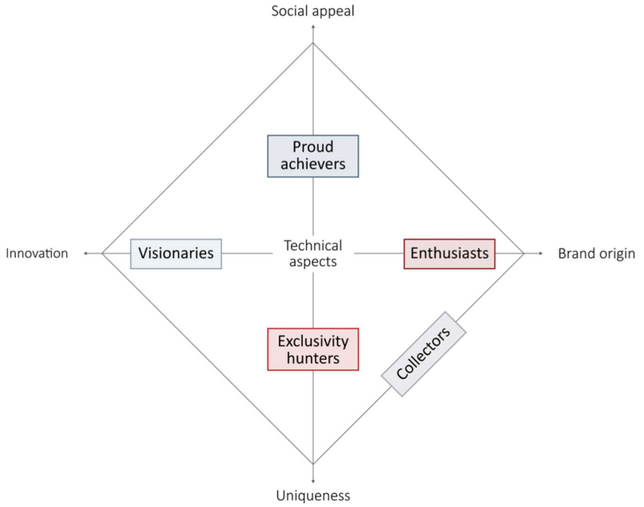


Figure 8, Clusters of luxury car customers
Image: Rezzano, F. Fallini, A. Braun (2021)

To better understand the luxury automotive sector and identify possible opportunity areas for NFTs and metaverse, a SWOT analysis and a journey map were used.

SWOT

The SWOT analysis (figure 9) provides more depth on the opportunities and threats (external factors), as well as an overview on the strengths and weaknesses (internal factors). The external factors were gathered through desk research, while the internal factors were enriched with information from my professional knowledge (2+ years of experience in the luxury automotive sector).

The **strengths** of OEMs from the luxury automotive sector are very much product and brand focused. The product's uniqueness and exclusivity and the high brand value are the most impactful strengths and the main reasons for keeping NFTs in mind, which empower the product's uniqueness and the tailor-made approach of these brands. These attributes give them a strong position to easily associate the new technology to them and potentially get value from it.

While these OEMs have particular strengths tied to being in the luxury sector, they also present **weaknesses** due to their smaller structure (compared to the ones of mass-market OEMs), like a complex manufacturing set-up and ramp-up, some limitations in resources, limited volumes and low economies of scale, lower bargaining power with suppliers. Moreover, being in the luxury category, they also have to deal with delicate crisis management and a strong power of customers. The one weakness that resonates most with NFTs is the presence of fakes of second-hand cars and of older heritage models, as NFTs present the characteristics of being able to provide an authentic and certified proof of uniqueness. Furthermore, luxury OEMs can show a resistance in changing and innovating towards matters that are outside the core business (car production) and relying on benchmarking, which can limit their ability to adapt to new technologies and market trends. Nonetheless, such new technology that presents strong similarities can overcome this obstacle, having the opportunity to make the OEMs more easily grasp the potential and value that can be provided. This would be especially useful to have the luxury OEM committed in implementing the innovation and changing things.

The **opportunities** for the sector are very much focused on technology (big data, SDVs, web3, ...), as well as relating to changing customers that come with new needs (sustainability, for once). Naturally, the technology developments clearly resonate with NFTs and the Metaverse. The changing customers also do, as they are getting younger and more tech savvy. Indeed, this last aspect is strongly linked to the world digitization, which shows to be both an opportunity and a threat for luxury OEMs. In fact, digitization requires OEMs to significantly invest in new technologies and capabilities, compliance with regulations and the adaptation to new business models. Moreover, historically, luxury OEMs have relied on personal interactions, such as through dealerships, track testing, and events, as a defining strength. However, with the increasing digitization, this cultural and historical approach could be challenged and may need to evolve or be enhanced digitally.

Another uncertainty that can be a potential **threat** for established luxury OEMs are the new competitors (start-ups, big tech companies, local players) that have risen due to strong geolocation and technology shifts, especially in China. Newcomers focus heavily on the differentiating power of technology, mainly to resolve electrification, connectivity, and other advanced-technology issues. As an example, big tech (software and service) companies such as Google, Sony, and Apple, who work on (autonomous) cars and software as well, are

aiming for a market share in the automotive industry. This underlines the rising competitiveness and importance of 'software' and services, hence, the rising importance of software-defined vehicles (SDVs). In this context, NFTs can be a clear opportunity for established luxury OEMs to be differentiated and, especially, to bring added value by providing a uniqueness brought to the digital space.
Last but not least, cyber security is a threat that, going towards more digitization, needs to be carefully taken in consideration. It represents a threat for the safety of the users as well as for data internal to the company.

Considering the SWOT analysis and the subjects of NFTs and Metaverse, it was possible to conclude that the **opportunity areas** for NFTs and the Metaverse to bring added value to luxury OEMs are:

- Support luxury OEMs in facing the weakness of having fakes of second-hand cars, older heritage models, and car parts (figure 9). Indeed, NFTs could provide a proof of uniqueness and provenance/history
- Support luxury OEMs in facing the weaknesses of being resistant to changing and innovating towards matters that are outside the core business (car production), which can limit their ability to adapt to new technologies and market trends (figure 9). In fact, NFTs show to be very fitting to the sector as they present such strong similarities with it, therefore they could overcome this friction, making OEMs more easily grasp the potential and real value that can be provided. This would be especially useful to have the luxury OEM committed in the implementation process
- Support luxury OEMs in facing the threat (and both opportunity) of world digitization (figure 9). Indeed, NFTs and the Metaverse can support in bringing added value in sync with the world and its younger generations going ever-more digital

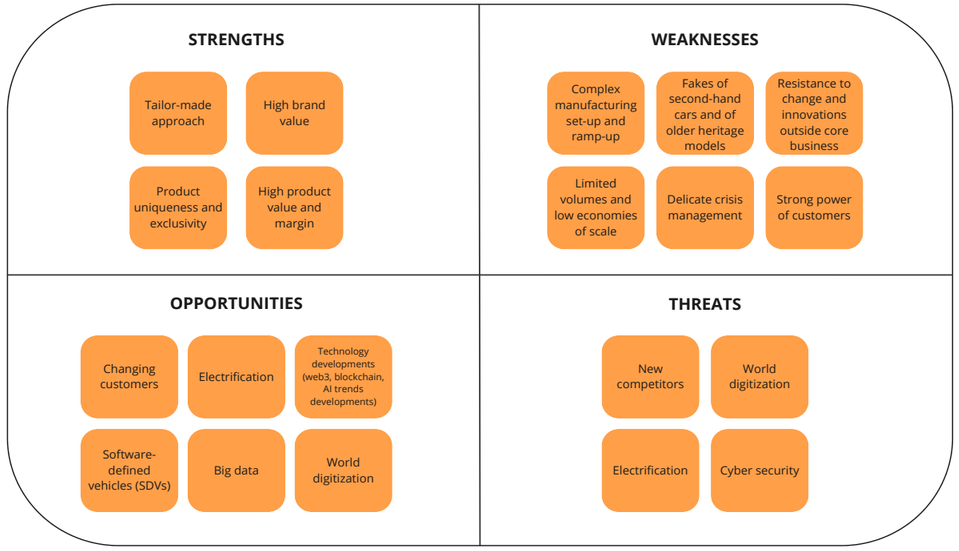


Figure 9, Luxury automotive SWOT

These opportunity areas will be considered at the end of the chapter (for the future vision).

The extensive SWOT analysis can be found in Appendix B.

CURRENT JOURNEY MAP

Another research for the luxury automotive sector was done on its current journey map. Given that very scarce information was available from desk research, the journey map has been enriched with information from my professional knowledge (2+ years of experience in the luxury automotive sector).

In the preliminary phase of the luxury automotive customer journey, characterized as "**Awareness & Consideration**," potential buyers engage in a thoughtful exploration of the prospect of acquiring a luxury car. This contemplative stage involves a combination of influences, including recommendations from peers, reading of specialized magazines, and consumption of video content. Touchpoints span a diverse landscape regarding events, auto shows, online platforms, social media, traditional media, and dealership visits. The stakeholders in this stage range from individual clients to friends, influencers, media outlets, OEMs, dealerships, fans, and various enthusiast communities. The overarching objective is to cultivate an awareness of the various luxury car options, diligently gather information, assess alternatives, and culminate in the crucial step of scheduling a test drive.

Transitioning into the subsequent stage, the "**Acquisition**" phase, the customer journey takes on a more tangible form. This stage is characterized by actions such as initiating contact with the dealership or customer service, engaging with brand experts for detailed vehicle specifications, and navigating the anticipation associated with a waiting period that typically spans 12-24 months. The touchpoints in this phase are made up of online platforms, phone communication, dealership interactions, and the use of dedicated apps. Stakeholders include OEMs, dealerships, clients, data management teams, production and manufacturing units, logistics providers, and customer support teams. The comprehensive goal involves configuring the ideal vehicle, fostering a personalized experience, tracking the order, remaining engaged during the waiting period, receiving regular updates, scheduling delivery, understanding warranty and service parameters, and concluding the process with meticulous documentation.

As the journey unfolds further, the focus shifts to the "**Delivery & Use**" stage, marking the tangible start of vehicle ownership. Key actions involve the pick-up of the vehicle and potential engagements with the dealership for post-purchase services. Touchpoints in this stage span across websites, apps, emails, dealership interactions, and phone communications. Stakeholders include the customer, OEMs, dealerships, technology partners, and service centers. The primary objectives involve the happy experience of obtaining the new vehicle, the subsequent enjoyment of ownership, getting used to the vehicle's features, the establishment of routine maintenance schedules, the prompt resolution of issues, diligent monitoring of vehicle health and performance, and the personalization of the vehicle through additional accessories or customizations.

In the subsequent "**Loyalty & Advocacy**" stage, the customer journey takes on a relational character, going beyond the transactional aspects. Active engagement with the brand, coupled with the sharing of personal experiences, becomes the focal point. Touchpoints extend across social media, word of mouth, websites, apps, events, phone communications, and continued interactions with the dealership. Key stakeholders include OEMs, customers, and dealerships, fostering an environment of mutual appreciation. The various

objectives include active participation in brand events, connections with fellow owners and enthusiasts, personalized interactions, a sense of value and appreciation from the brand, the sharing of positive experiences, constructive feedback provision, and the ongoing awareness of the brand's latest innovations.

Concluding the luxury automotive journey is the "**Car Selling or Buying**" stage, where the journey diverges into the dual roles of selling an existing vehicle or getting on the search for a new one. Sellers seek an understanding of their vehicle's value with an eye toward a favourable return on investment. On the buyer's side, navigation through online platforms, dealerships, apps, and virtual marketplaces is characterized by a search for financial clarity, transparent pricing, and the assurance of a brand's reputation and vehicle quality. Stakeholders in this phase include customers, potential buyers, OEMs, dealerships, vehicle appraisal services, and third-party marketplaces. The associated objectives include clarity and confidence for sellers and buyers alike, leading up to financial considerations, brand reputation, and the thrill of a new acquisition.

In summary, the luxury automotive customer journey unfolds as a cohesive journey, blending aspiration and experience across various stages. This journey is not only a transactional search but a journey that puts together the complexity of ownership, relational dynamics, and the search for automotive excellence.

Considering the journey map and the subjects of NFTs and Metaverse, it was possible to conclude that the **opportunity areas** for NFTs and the Metaverse to bring added value to luxury OEMs are:

- Provide a personalized and tailored experience. Indeed, the Metaverse, being a digital environment or else something governed by algorithms, can be tailored and provide personalization to the customer. Plus, the digital wallets can provide more information about the customer to the OEMs, giving them the possibility to personalize even better
- Provide brand engagement during the waiting period between order placement and delivery. Indeed, the Metaverse, being a digital environment, can provide engagement to the customer during the waiting period
- Provide prompt and professional guidance if the customer encounters any issue or help he/she may need. Indeed, the Metaverse can provide an immersive way for customers to receive instant assistance, through 1 on 1 XR calls with the dealership/service center or through immersive manuals on the car functionalities
- Provide a good return on investment. Indeed, NFTs can provide traceability and transparency to the car's ownership and status, giving, in turn, added value to the car

These opportunity areas will be considered at the end of the chapter (for the persona and future vision).

The extensive current customer journey map can be found in Appendix C.

1.2 Future Imagining

After exploring the technologies involved in the project as well as the current context of luxury automotive, the next steps are about exploring the future context to ensure relevance in the roadmap, outlaying the trends in a comprehensive scenario. Indeed, the future imagining step contributes to build the persona and the future vision as outcomes of the value mapping phase.

1.2.1 TIMEFRAME

For the project and for the scenario depiction, a timeframe had to first be identified.

The chosen timeframe was 5 years. This choice was made because, as Gartner (2022) reports (figure 10), the majority of the emerging technologies are still in their initial development stage, and the maturity and widespread adoption will be reached on average in 5 to 10 years. As technologies change and emerge rapidly, 5 years was considered a good timeframe and therefore chosen for the project.

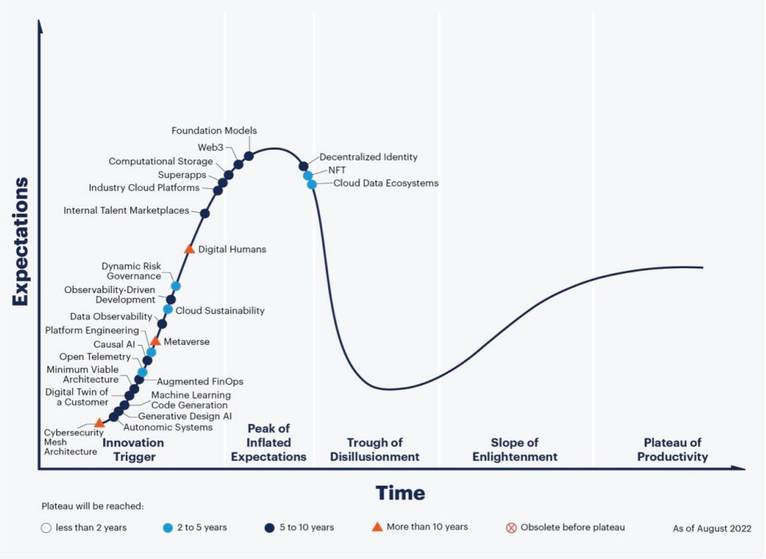


Figure 10, Hype Cycle for Emerging Technnologies 2022
Image: Gartner (2022)

1.2.2 SCENARIO CREATION

The future context was explored by doing creative trend research to get an idea of the technologies, trends, and developments in the future luxury automotive. Within the creative trend research method, the trend scenarios technique (Simonse, 2017) was employed. "Generating trend scenarios involves explorations that discover possible occurrences in the future. A trend scenario attempts to capture the richness and range of possibilities. At the same time, it organizes those possibilities into narratives that are easier to grasp" (Simonse, 2017).

First, to have a general overview, research on DESTEP trends was done (from desk research). The DESTEP analysis is a framework used to understand the external environment and the issues which may impact a certain domain/organization. The DESTEP groups external factors into six categories: demographic, economic, social, technological, environmental, and political. The extensive trends can be found on Appendix D.

Secondly, the trends were mapped on axis of impact (high and low) and uncertainty. As a last step, the two trends on the top right corner were selected to build the scenario axis for the scenario creation (Simonse, 2017).

From the DESTEP analysis it could be seen that **demographically**, the luxury automotive sector responds to the growing global population and the ongoing urbanization of small to medium cities, which collectively

shape the market's potential consumer base.

Economically, the luxury automotive sector is influenced by the shift of the world economy towards the East. Moreover, the emergence of Gen Z millionaires introduces a new demographic of high-net-worth individuals with distinct preferences. At the same time, challenges may arise from a global supply chain crisis and a growing inflation rate.

Social dynamics can also significantly impact the luxury automotive market, reflecting an era of value-led segmentation, digital communities, and a care for transparency especially by the younger generations. Consumer expectations are determined by a digital-first culture, emphasizing personalization, anti-conformism, and conscious spending. These social shifts show the need of adaptability from luxury OEMs to align with evolving consumer values.

Technological advancements play a pivotal role, both within the broader technological landscape and specific to the luxury automotive sector. The landscape witnesses a surge in big data, Internet of Things (IoT), and artificial intelligence, while the development and implementation of post-mobile interfaces, blockchain, NFTs, and the metaverse bring new dimensions to digital experiences. The automotive sector is also characterized by a commitment to electrification, connectivity, smartification, Advanced Driver Assistance Systems (ADAS), autonomous driving, and shared mobility.

Environmental considerations, such as the increase in global temperatures and city restrictions imposed based on ecological factors, puts pressure on the luxury automotive industry to adopt sustainable practices.

Last but not least, **political** factors, including growing emissions regulations, the importance of GDPR, and the Chinese expansionism, contribute to the complex regulatory and geopolitical landscape.

The conclusion of the DESTEP research was drawn from the trends mapping on axis of impact and uncertainty (figure 11).

The desk research that was done for finding the trends was used to understand their level of certainty and impact for the sector. For example, the electrification trend was positioned with the highest impact and a low level of uncertainty because, concerning the certainty, electrification is something that is already happening today, and, as of the impact, it is stated that "electrification will differentiate the top luxury tiers" (McKinsey & Company, 2022). Indeed, McKinsey & Company (2022) reports: "Battery-electric vehicles will be dominant across all luxury-segment tiers by 2031".

From this mapping exercise it was possible to see that, among all the trends, the technological ones show a prevalence in certainty and high impact. Nonetheless, the metaverse & web3 and post-mobile interfaces & devices shift to being the most impactful and uncertain overall. They have a high impact because they are related to the world digitization and to a change in how online and virtual are experienced, therefore they affect users' habits and expectations. These will also affect how users want to experience their luxury car and the buying and post-purchase process. These trends are also highly uncertain because, compared to the other trends, it is not known and harder to predict how and if they will unfold.

As a next step, the chosen trends were plotted to create opposite axis needed for the creation of the scenario (figure 12).

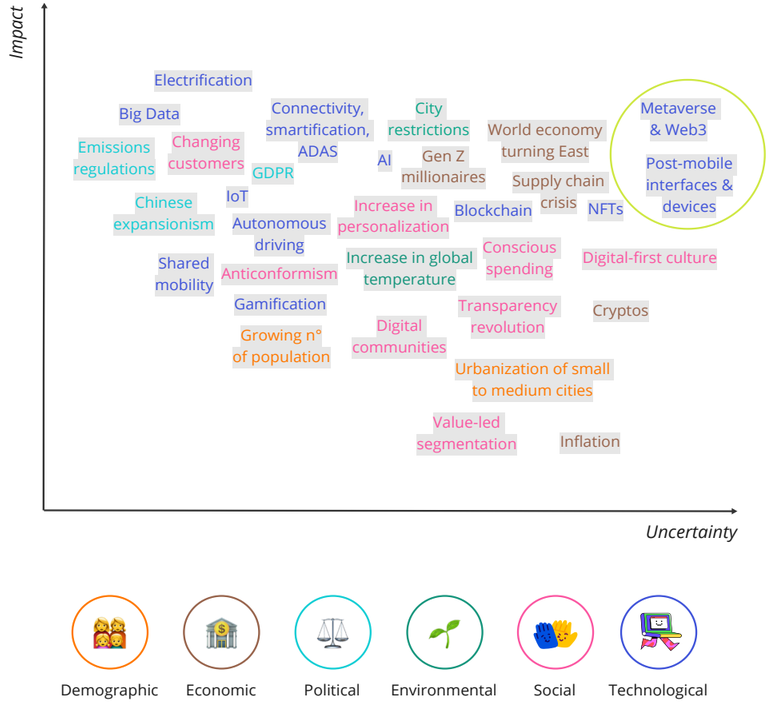


Figure 11, DESTEP trends on axis of impact and uncertainty

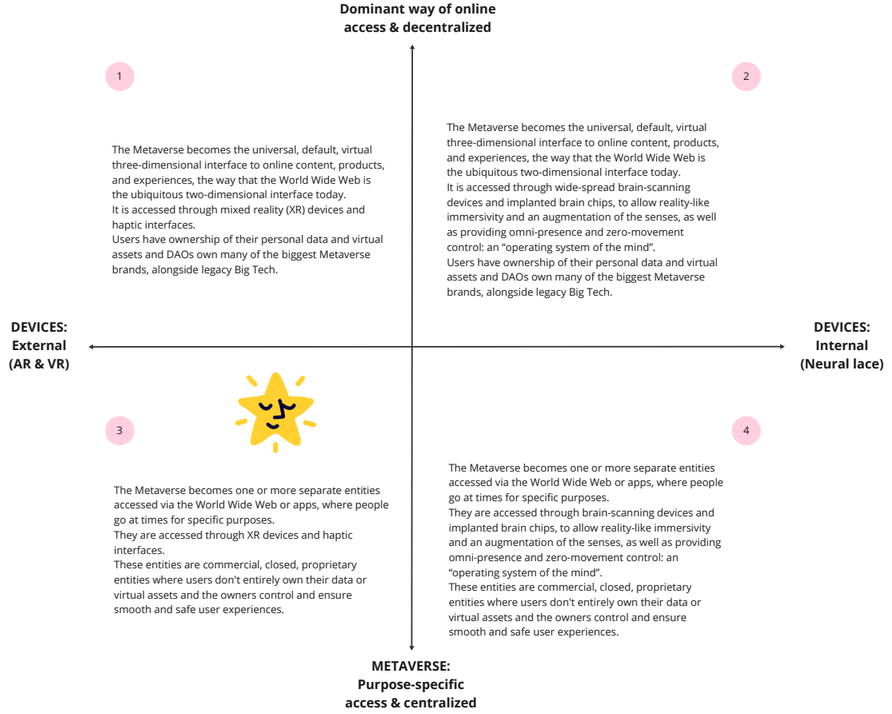


Figure 12, Axis for scenario creation

The methodologies of scenario creation and analysis, on average range from selecting 3 to 5 scenarios (Amer, M., Daim, T. U., Jetter, A., 2013). For example, Schnaars (1987) identifies four background themes in scenario studies: Favourability to the Sponsor (selecting a scenario that represents an 'optimistic' prediction, and another that represents a 'pessimistic' prediction), Probability of Occurrence (one of the scenarios is labelled as 'most likely'), Single Dominant Issue (one factor, which outcome is central to the item being forecasted – e.g. the economy, or government policy) and Themes (capturing the fact that there are many issues that compete, combine and interact with each other).

After giving a thought at the four scenario outcomes, it was decided to proceed with Probability of Occurrence, therefore with the most likely scenario. That is because the other scenarios seem unreal to be happening in the next five years, as explained below.

The chosen scenario to continue working on, is number 3, which is considered the most likely to happen because:

- It is unlikely that brain-scanning devices and implanted brain chips will become wide-spread in five years,

these devices are still in a development/testing stage, certainly not at the same stage as XR devices
- It is also unlikely that in five years the Metaverse becomes the universal, default, virtual three-dimensional interface to online content, products, and experiences, the way that the World Wide Web is the ubiquitous two-dimensional interface today

Indeed, the near-term metaverse is associated to augmented reality to enhance, not replace, the human experience, and the long-term metaverse is on the other hand associated to brain computer interfaces (World Economic Forum, 2022).

In the next section which details the chosen scenario, there is an elaboration of the two uncertain trends, as well as the most impactful and certain ones for the luxury automotive (smartification, big data, changing customers, electrification, emissions regulations) to try and give a more complete and integrated overview.

Other that the written detailing, a representation of the chosen scenario was done through some images (at the end of the chapter) and a persona in the next section.

DETAILING OF THE SCENARIO

In the world of 2028, users still use the World Wide Web (with some Web3 additions, like blockchain integrations as NFTs and crypto) as the dominant interface for general online experiences. Add-on options exist, that allow full 3D immersion (metaverses) and the merging of physical and virtual settings, but they have not become ubiquitous the way World Wide Web has, and the several add-ons tend not to be interoperable, each using their own protocols for 3D representation and user interaction.
People mainly use metaverses for specific purposes where they want a more immersive experience than what the World Wide Web offers, such as gaming, social activities, or specific job functions like remote-controlling devices. The metaverses are something users 'dial into', not a metaverse that they automatically log into whenever they use the internet. These metaverses are commercial, proprietary entities that have become so universally preferred by users that no real alternative exists, much like how Generation Z preferred Facebook's closed and proprietary ecosystem (which includes Messenger, WhatsApp, Instagram, and more) for communication over the open and non-proprietary e-mail or text-messaging systems.

The metaverses are owned and run by big tech companies or governments, who control and ensure smooth and safe user experiences. These owners monitor and control all content and activities in their meta-spaces and they decide who can use their metaverses and how – users can take it or leave it.
Some metaverses have built connections with the most popular blockchains and wallets to let people use their decentralized identity and NFTs (assets) in their metaverse. Niche users who prefer fully decentralized options, go for less wide-spread platforms.
Metaverses are accessed with multiple XR (Extended Reality, e.g. VR and AR) devices and haptic interfaces (manipulating virtual features with hand or body movements), which allow a far more immersive experience where the physical and virtual worlds merge.
In these metaverses, digital goods (NFTs) hold the same value and importance of physical goods for users. These assets are used to build one's digital identity and to showcase ownership (digital and physical). Indeed, digital wallets are an extension of social media, as in being used to showcase and see holdings, certifications, attendances, interests among users. They are used to bring personal information and items from one metaverse to the other.

As the global economy has grown, people worldwide have attained higher levels of wealth, leading to a growing demand for luxury goods and services, including luxury cars. Ultra-high-net-worth individuals (UHNWI), people with more than $30 million in investable assets, and high-net-worth individuals (HNWI), people with assets ranging from $1 million to $30 million, have largely grown in numbers and the nexus of sales growth for luxury cars has shifted from North America and Europe to Asia and the Middle East.
Established gaming habits, world-wide but especially in Asia, have made virtual influencers and phygital identities largely spread and have a high importance, not only among teens and younger users, but also for people in their 30s. Almost every one of them have digital wallets, through which the wealthy ones own digital luxury goods (tied to a physical good, but also ones entirely digital). Their use is spread among social medias, metaverses and gaming platforms. For this reason, luxury OEMs push on their metaverses to empower individual identities beyond physical appearances or IRL interactions.

Many wealthy people in their 30s look for their luxury car, a good proportion of which being female, which mostly look for luxury sports utility vehicles (SUVs). With the increased emissions regulations and their eye on sustainability, these luxury car buyers expect (luxury) electric vehicles to be available, so they look out for an eco-friendly set of wheels to show off their wealth. When choosing which car to buy, they have the range of brands in mind, but they first look for the wanted feature sets and the latest in connected technology to find the perfect match to their personality, their personal style and what they want to express with owning a car. So, they start to research online as well as in the brands' metaverse, to talk to the virtual assistant and get first recommendations and learn about their innovations and new technologies, before booking a personal appointment. Indeed, although the new younger wealthy customers almost always start their research and first approach online, they still want to visit the dealership before making the purchase. They are interested in assessing all contextual information surrounding a product and want to feel as though they are making the best possible decision.
Once chosen the luxury brand to go with, they expect excellent service experiences and personalization. However, some wealthy owners know from friends and personal experience that the service levels (after-sales and in dealerships) of some luxury OEMs are not always satisfying (e.g., too much time to receive support or waiting in line to be served, as could happen at a dealership, especially given the singular treatment these customers receive at other luxury retailers). Some wealthy owners from older generations also struggle to stay behind the innovations and implementations OEMs make on the new models.
Indeed, newer luxury OEMs have identified customer

Asian 30 years old man looking at a project through augmented reality glasses.
Image created with Midjourney

experience as their core strategy to differentiate themselves against traditional players and have created a go-to-market approach that fully reflects the customers.

DTC enables these luxury OEMs to own the customer experience from end to end, which allows them to fully personalize the customer relationship and help ensure a seamless omnichannel journey. However, some OEMs, mostly the traditional ones, have not implemented this approach, due to the challenges of DTC which requires the build-up of necessary capabilities to move from wholesale to retail.
Therefore, the traditional luxury OEMs are trying to react by adding new ways to approach prospects through brand experiences (e.g. brand spaces, inviting prospective customers to a meal or event, highly-curated showrooms centered on their brand storytelling) and new car-purchasing approaches (more interactive, personalized and fun).
Luxury OEMs are also pushing on digital channels and new technologies for increased personalization, to meet the customer's distinctive physical, psychological, social, and emotional needs. Personalization reinforces respect, status, and positive self-image (for an emotional experience), which for OEMs serves as a plus, on top of the customization they offer, that focuses on features and functional characteristics. Indeed, the younger wealthy customers, crave a sense of purpose and personal connection to what is being purchased and they turn to luxury brands to empower them in expressing their individual identities.

The dealerships are now a central hub for real customization, where customers can customize on the service-level. For example, the dealer tailors the service based on the customer, who may want a bigger car on the weekend or to go skiing in the winter. And so, it might be the purchase of the car, plus a package to have access to a different vehicle in the summer, the convertible for fall weekends, and in the winter the SUV to go in the mountains, so something that is really customized and tailored to who the customer is and what they want their vehicle for. This implies that a sale may be a sale plus a subscription, personalizing the vehicle choices based on the customer's usage occasions.

Dealerships still have fleets of both new and used cars, and they still know the local community very well and the different type of customers, so they are now using this knowledge and specialization to provide the best local mobility services and address different customer types. Since the customers know what they want before they arrive at the dealership, car dealers now create a "hospitality-service" relationship, similar to a high-end hotel. By the time the customer shows up at the dealership, he/she is well known and understood. Everything that was decided upon during his/her online search will be waiting. The dealer knows what brand

Luxury brand metaverse setting - the user explores the brand's offering with the help of a virtual assistant, trying to find his/her ideal car that matches their personality and desired feature set.
Image created with Midjourney

experience is the one that best appeals to the specific customer and the salesperson knows about him/her that the customer feels as if the time spent was designed for them alone. They feel that the service they received matched who they are and they receive the exact vehicle that they want.

Luxury OEMs have also adapted to Asia's (especially China) younger customers and expectations, given it being a region which has grown a lot in sales, becoming the biggest luxury market. The traditional OEMs are competing with local champions that have developed a strong connection with consumers by offering a seamless customer experience, technological ecosystems, and innovative offerings. Newer luxury OEMs (in particular EV-related) have innovated to meet evolving customer needs and focusing heavily on the differentiating power of technology. They promote this difference not only to enhance the ownership experience but also to address social concerns such as the transition to sustainable energy.
Therefore, traditional luxury OEMs are releasing models which have greater technology integration, like powertrain functions, digital interactions, connectivity, and ADAS features. Some OEMs also offer traditional local customization (for example, premium exterior paint or special interior features), and local bespoke specials that more deeply integrate unique features around connectivity, navigation, and infotainment (a seamless integration with the local digital ecosystems).

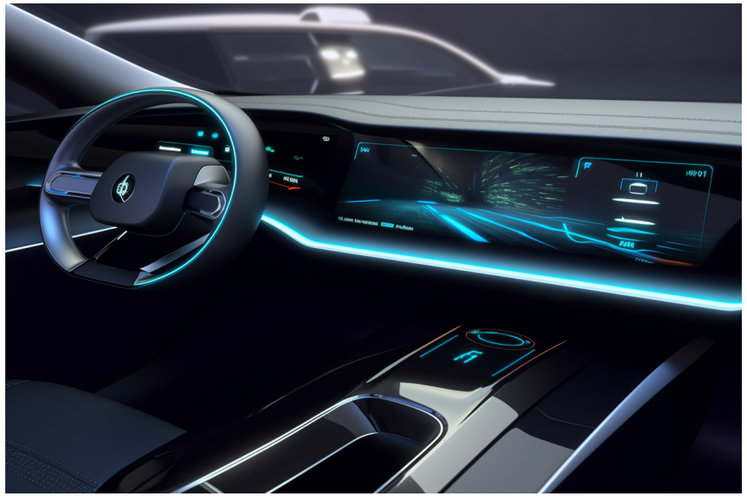
Luxury car consumers (especially the digitally-native) are comparing the experience of a car with their most important digital companion, the smartphone. They think about cars in the same way they do about smartphones: the ultimate connected device that provides real-time responses across channels, personalized features and services. Seamlessly integrated into all parts of professional and personal life, it entertains; orders food for them; lets them participate in social communities and it even provides access to their homes. Traditionally, cars didn't provide a similar experience, which is why the smartphone had taken over as the user interface in the vehicle (for example, Apple CarPlay). It is for this reason that the industry has moved into a new world of software-defined, service-driven digital mobility, with the promise to behave more like smartphones. That's either by converging cars with smartphones, as with the "digital key" feature that enables the driver to open and run the vehicle. Or through connected features of the car itself, such as paying at charging spots automatically or streaming games on the screen.

Moreover, the digitally-native vehicle users are accustomed to making software updates to enhance the experience of a product or service. Indeed, OEMs have understood that the vehicle-centricity of the past is no longer enough to excite consumers. The luxury automotive industry has pivoted from only hardware creation to software optimization and vehicles are a part of software and service platforms that span all aspects of consumer mobility. Software is a source of new premium services with high profit margins, comparable to what we have seen in the smartphone industry. OEMs build those services on the connected ecosystem, as with music streaming, parking or tolling. Indeed, connected features and digital services are essential elements for consumers.

OEMs now approach the car along the lines of a system of systems (i.e., an interplay of standalone systems that, as a collection, enable new and unique capabilities), thinking beyond the car as simply "the vehicle plus x", where the software is fitted to the vehicle. These systems include the front-end, cloud back-end, interfaces to infrastructure and ecosystems, and the vehicle platform. Moreover, architectures have been upgraded to support the artificial intelligence software needed for ADAS and autonomous driving, which make traveling by car safer and more efficient.

Standardized platforms for smart mobility services have been defined, enabling the reimagination of automotive experiences. Last but not least, Internet of Things (IoT) capabilities have advanced, which enable data to be transmitted securely across more complex ecosystems of interconnected devices.

When buying a car, customers ask themselves: "Which vehicle offers which services?". Therefore, the superior value of the offered service is now crucial. On-demand car features (ODCF) have become a unique selling proposition for luxury OEMs, the approach in which the vehicle acts as a platform and offers end users software-based mobility services, thus creating value along the entire vehicle lifecycle. This means that customers have the option to unlock features for their vehicles as needed, providing new differentiation options to OEMs. As a result, OEMs have shifted from manufacturing based on customer configuration to manufacturing based also on full functionality. Each vehicle is produced with all possible hardware components and differentiation is provided to the customer on-demand. This holistic approach includes considering both hardware- and software-based features. Hardware-based features require hardware components to be built into the vehicle. Examples include heated seats, extended battery range, enhanced vehicle performance or safety features involving camera or sensor functionality such as blind spot alerts. Customers can now unlock specific features as desired and on-demand because the necessary components are already built into the vehicle (e.g. a battery range increase via over-the-air updates). Moreover, beyond making these built-in features adjustable to an individual's preference, for example temperature preference in the case of heated seats, OEMs also leverage this customer's data to remind them of the feature if left unused, tailor it according to needs or location, and even package it as part of a premium in-car personalized environment proposition.
On the other hand, software-based features do not necessarily require built-in hardware components and are often infotainment based such as information on current fuel prices or real time traffic updates. As an example of software feature, OEMs offer in-car intelligent voice assistants (with an artificial intelligence integration) that act as a concierge in the dashboard that caters to a wide range of driver and passenger needs. By leveraging a variety of biometric technologies, it also provides levels of personalization and security that are quickly accessed using voice. Moreover, empathetic car interiors respond to an individual's in-car experience and preferences using an array of sensors to pick up nonverbal as well as verbal cues.
ODCF extend the customer journey. The customer is not only enthusiastic about their vehicle at the time of purchase, but also about new functionalities that arise during the entire vehicle lifecycle. As such, functionalities



Digital cockpit from which to pick options of packages to purchase, for example city package, racetrack package, winter holiday package, summer holiday package. These packages can be chosen manually from the cockpit or through voice control with the built-in personal virtual assistant, which also provides general guidance and help to the driver, for example helping to decide where to go to dinner and automatically reserving a table.
Image created with Midjourney

and regular updates have become a differentiator for automotive manufacturers with endless possibilities for features that can bring value to customers. The goal is a well-designed and structured ODCF portfolio to allow individual customers to customize their cars and enjoy greater freedom, without being overwhelmed by the myriad of features and booking options.
Moreover, ODCF also lead to higher residual value of used cars. Customers can now, using ODCF, configure their second-hand car the way they want and enjoy the flexibility to try new features for years to come. Indeed, many affluent consumers view luxury goods as long-term investments and as a way for them to invest in alternative value-holding assets beyond traditional investments like gold or diamonds - ODCF allow for a more convenient resell.

Along a software-centric approach, the over-the-air (OTA) mindset is now also 'a norm' among luxury OEMs, which have built processes more speedy and agile, and are based on data-driven decision-making. For decades, car features were updated with each model, now, vehicles only receive OTA updates. This keeps customers satisfied and the competition on its toes.
Data-driven business models built around ODCF have opened up a new era of growth for the luxury automotive industry and its retail value chain. These models now let OEMs use on-board and off-board data to create further mobility services. Vehicle data is the backbone of future growth and innovation in ODCF, from the perspective of new features development but also other data-based mobility services. The continuous testing and UX improvements help to optimize services and to launch new products, securing the long-term viability of the ODCF revenue stream for OEMs.

With these developments, customers are now able to buy vehicles and easily customize them in advance to meet their individual needs. In 2028, this happens via customer profiles, other than via vehicle configuration by production. As an example, customers book or buy a "city package" to drive from the office to dinner in the city and have access to useful features including parking aids close to her/his destination. The same customer, on the way back to visit his/her family 400 kilometres away, books the "long-distance package". Through this package, the customer receives an extended battery range, and enhanced autonomous driving and safety features. For the perfect in-car experience, the customer also syncs their personal apps with their vehicle and book additional comfort features. Offering features on-demand not only has changed the way customers interact with their vehicles, but has led to elevated vehicle performance as well. With new and extended features such as increased horsepower and personalized sounds in electric vehicles, customers are constantly positively interacting with their brand of choice. In the past, this contact used to be limited mainly to repairs.

As with every IoT business model, for the implementation of ODCF, OEMs have geared up for the crucial task of privacy protection with corresponding system configuration options for the vehicle's communication with the ecosystem. Because data protection violations can result in severe penalties, secure function and update downloads have come to have a central importance. Moreover, data compliance has also come to be a crucial prerequisite to successful data management, which is in turn necessary to leverage the true potential of ODCF. Data compliance is critical when offering ODCF, and non-compliance can be sanctioned by high penalties if data is not sufficiently encrypted, the permission to collect specific data is not valid, or if personal data is transferred between different entities without permission. OEMs are aware of the risks and carry out comprehensive risk assessments, implement appropriate measures and also prepare both systematically and mentally for cyber-attacks and IT-security incidents.

1.3 Chapter Conclusions

From the opportunity areas (obtained from the context research section – in the dedicated "key take-aways" page) and from the future scenario (obtained from the future imagining section), it was possible to generate the persona and the future vision.

Indeed, the two give an answer to the first main question of the project "What could a future context look like, considering the changes in luxury automotive, NFTs, and the Metaverse?". In fact, the two are the result of the comprehensive analysis done on the current context of the subjects, as well as the future one.

To start, the persona is the result of both the future scenario (indeed it considers the future trends) and of the opportunity areas found from the journey map. In fact, it was decided to include these jobs-to-be-done in the future persona because those already belong to the current luxury customers and will likely remain valid for customers in a scenario five-years from now. Therefore, they have been considered for the persona creation (in the Needs & Goals section of the persona, below). Below is a recap of the jobs-to-be-done identified as opportunity spaces from the journey map:

- Engage with the brand during the waiting period between order placement and delivery
- If I encounter any issues or help/guidance I may need with my vehicle, I want to have them addressed promptly and professionally
- Have a good return on investment
- Have personalized and tailored experiences

The rest of the persona information derives from the trends of the future imagining section (namely: gen Z millionaires, Chinese expansionism, changing customers, increase in personalization, digital-first culture, gamification, increase in global temperature).

In itself, the persona defines the values and characteristics of the (future) customer. Below the persona overview.

YUZE ZHANG

- Name: Yuze Zhang
- Age: 35 years old
- Role: Successful tech entrepreneur
- Status: High net worth individual
- Location: Shanghai, China
- Family Status: In a relationship
- Gender: Male

VALUES:

- Importance of quality and personalized approach: Yuze is a selective buyer who does his research before making a purchase. He values quality and performance and is willing to pay a premium for a product that meets his expectations, allowing him to customize it to his taste and preferences. In the case of cars, he appreciates the ones that can be tailored to his exact specifications and personality, also in terms of features set and connected technology.
- Status-conscious: As a successful entrepreneur, Yuze is status-conscious and values luxury and exclusivity in what he buys and his lifestyle, as a reflection of his social status and success
- Importance of technology: Yuze is a tech-savvy who strongly appreciates new innovations and technological advancements; indeed, he often looks out for new ones to try, especially when it comes to new gadgets to experience the web. In cars, he is especially interested in connectivity and entertainment systems, as well as safety features.
- Games lover: Yuze has a passion for digital games and curates his digital wallet with his digital belongings, but he also enjoys playing board games with friends.
- Eco-friendly lifestyle: Yuze strives to be mindful of the ecological footprint associated with his lifestyle and takes care to minimize his environmental impact.

NEEDS & GOALS – Yuze wants to:

- Sell his luxury car and buy a new one
- Have a good return on investment
- Engage with the brand during the waiting period between order placement and delivery
- If I encounter any issues or help/guidance I may need with my vehicle, I want to have them addressed promptly and professionally
- Have personalized experiences, feeling they are being tailored for him
- Feel sure and confident of his new car purchase, knowing it represents his style and personality
- Showcase and use his car in the virtual (games, metaverse, digital wallet)
- Experience the brand (both IRL and digitally) and its community, being involved and participating in brand activities and experiences and getting to know other car owners

PAIN POINTS & FRUSTRATIONS:

- He feels discontent from the impossibility to increase the residual value of his car
- Feels frustrated when he doesn't receive personalized experiences and he has to put in too much effort to achieve them, especially in the case of brands/places that he previously interacted with
- Waits too long for the car delivery and feels poorly involved during this time
- Feels frustrated for the limited opportunities and platforms to showcase his luxury car in the virtual space

SUMMARY

Yuze, a 35-year-old tech entrepreneur in Shanghai, is a selective and status-conscious buyer who values quality, luxury, and exclusivity. He's tech-savvy, loves digital and board games, and maintains an active, eco-friendly lifestyle.

His current goals include selling his luxury car for a good return and buying a new car that he feels represents him and that can provide features suitable for every occasion, as he seeks a versatile car for city driving as well as road trips.

Pain points include the long car delivery times and the limited opportunities for virtual showcasing of his car.

On the other hand, the future vision is part of the conclusions of this chapter as it is also created from the opportunity areas found from the context research and from the future scenaio of the future imagining section.

For roadmaps, a future vision is fundamental, as it gives an expression of a desired future where it provides a strategic reference point for actionable innovations (Simonse, 2017).
The future vision was done taking in consideration that it was seen form the opportunity areas that NFT and Metaverse technologies can bring added value to the customer journey and, as seen from the SWOT, they can support luxury OEMs in facing world digitization (both a threat and an opportunity for luxury OEMs), in facing the weakness of having fake models or car parts circulating and of being resistant to changing/innovating. Moreover, the future scenario testifies a landscape where the younger and tech-savvy customers look for a digital experience, even more personalized, as well as more engagement with the brand, reinforcing the support that can be given by blockchain technology to luxury OEMs.

Therefore, the identified future vision is:

In 2029, luxury OEMs can lead the way in delivering meaningful and superior digital, integrated experiences, by harnessing blockchain technology.

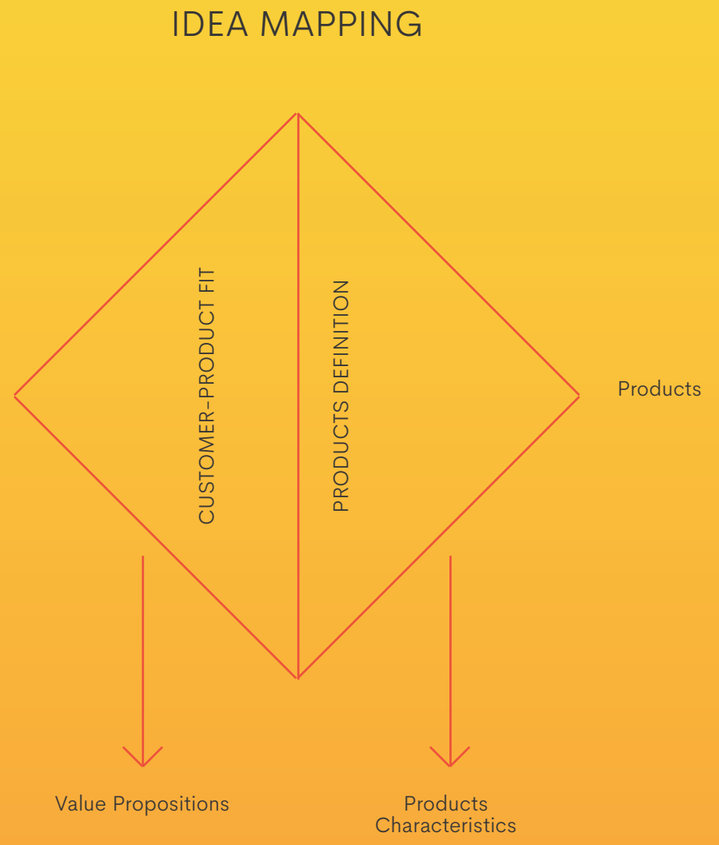
The future vision is phrased with "lead the way" because, rather than being guided by other industries or waiting for a defining moment (as pointed out in the SWOT, this is one of the weaknesses of luxury OEMs), with these technologies luxury OEMs have the opportunity to proactively "push" the boundaries beyond traditional approaches by digitally elevating the uniqueness of luxury cars and enriching the digital experience.

As a recap, this value mapping chapter was made of a context research part and a future imagining one, which led to identifying the values of the future customer (persona) and for the luxury OEM (future vision). The future vision will be the strategic reference point for the roadmap, while the persona will serve as the foundation for the next phase of idea mapping, for the definition of the products.

CHAPTER 2

Idea Mapping

The purpose of the idea mapping phase is to discover matches of the persona and potential products that can provide interesting opportunities for the future business development.
Building from the identified persona from the value mapping section, idea mapping starts with determining new customer-product fits, generating new value propositions (a concise statement of the benefits that a company is delivering to customers who buy its products or services), and ends with defining the related products, which is needed for the next section (pathway mapping) to find the needed requirements and build the steps for the roadmap horizons.



2.1 Customer-Product Fit

The Value Proposition Canvas (Osterwalder et al., 2014) was used to layout the needs and frustrations of the persona and to understand what products can address those in a unique and compelling way.

Indeed, it was chosen to use the Value Proposition Canvas as it is a strategic tool used to design and understand the value a product or service provides to its customers. It is structured into two main sections: the Customer Profile (on the right) and the Value Map (on the left) – see figure 13. The Customer Profile identifies the jobs, pains, and gains of the target customers (in this case, of the persona from the value mapping phase), while the Value Map outlines how the product or service alleviates customer pains and creates gains.
The canvas is needed to visually articulate and analyze the alignment between what a customer needs or wants and what a business can offer. It helps to create value propositions, ensuring that they effectively address customer needs.

The Value Proposition Canvas needs to be filled starting from the customer profile (on the right). For this, the persona was used: Yuze's needs & goals to fill-in the "jobs" part of the canvas and Yuze's pain points & frustrations to fill-in the "pains" part of the canvas. As a subsequence to the "pains" part, the "gains" part was also filled in.

In terms of **customer jobs**, there are three distinct categories: Functional (like getting from A to B), Social (like impressing friends and colleagues), and Emotional (like getting peace of mind). Examining these categories through the lens of the persona, Yuze, revealed the categorization of his specific jobs.

Functionally, Yuze aims to purchase a luxury car, whether new or second-hand, and desires a high return on investment when selling his luxury car. Additionally, he values prompt and professional guidance of any issues or help needed for his car.
On the social front, Yuze seeks active involvement in brand activities and experiences, both in the physical realm and in the digital space. Furthermore, he wishes to showcase and use his car in virtual environments like the metaverse, digital wallet, and games.
Emotionally, Yuze's jobs involve feeling sure and confident about his new car purchase, and he places importance on a personalized and tailored experience throughout the customer journey.

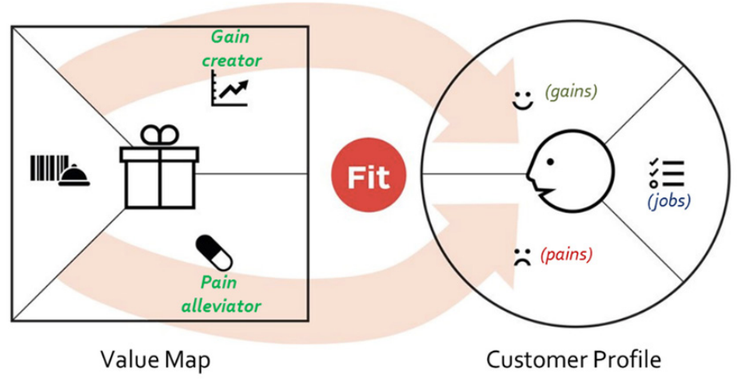


Figure 13, Value proposition canvas
Image: Osterwalder et al., 2014

Yuze encounters a range of **challenges and frustrations,** as outlined in the "pains" part of the canvas (figure 14), while navigating his tasks. Notably, he faces difficulties

in increasing the residual value of his car, expressing doubts about the credibility of sellers when acquiring a used vehicle, going through prolonged wait times for his car delivery while feeling detached during this period, and experiencing limited digital interactions with the brand. Furthermore, Yuze expresses discontent over the scarcity of opportunities to digitally showcase his luxury car, dissatisfaction with generic and impersonalized experiences that demand substantial time and effort on his side, and irritation when car issues arise without prompt resolution.

On the other hand, Yuze defines a successful outcome by various **gains**, outlined in the "gains" part of the canvas (figure 13). He seeks tailored and effortless experiences that align with his personality, lifestyle, and interests, fostering a sense of being valued as a unique individual. Additionally, he aspires to take part in exclusive digital brand experiences and events, receive accessible and helpful guidance for self-assistance or understanding his car's functionalities, and enjoy the privilege of digitally experiencing and showcasing his car. Moreover, he values an increase in the residual value of his car and desires access to certified vehicle history, service records, and professional inspections to ensure the condition and maintenance history of his luxury car.

Given this overview of the customer profile, it was possible to fill-in the value map of the canvas (on the left). This way, it was possible to identify the offerings that best fit with the customer profile.
First of all, the products and services part was filled in (the left section of the value map). Thanks to this canvas and the overview it provides, it was possible to do a brainstorming on the customer profile and identify the suitable products.
Next, the following sections of the value map were filled in to define how pain was relieved and gain created.

Indeed, the resulting value propositions that capture these pain alleviators and gain creators with reference to the customer profile are reported below. For this, the Geoff Moore method was used (HubSpot, 2023), which provides the following formula to use:
"For [target customer] who [needs or wants X], the [product/service] is [category of industry] that [benefits]"

OWNER'S PROFILE NFT

For luxury car customers who want to have a superior personalized experience, the profile token is the personal and unique customer token that carries the holder's preferences and interests. It gives the possibility to have adaptive and transferable personalization anytime he/she interacts with the brand, both in-car and in brand experiences, providing maximum confidence in the purchase of the car (tailored recommendations and ad-hoc ODCFs).

NFT DIGITAL PASSPORT OF THE CAR

For luxury car customers who want to buy or sell a luxury car, the digital passport provides a transparent and certified record of the vehicle history, from its VIN number and parts specifications to its maintenance and service done, providing an increased residual value, as well as peace of mind and certainty in the process of second-hand car purchase.

NFT DIGITAL TWIN MODEL OF THE CAR

For luxury car customers who want to digitally experience and showcase their car, the digital twin is the unique twin of their car that gives the possibility to have their exact car for digital use, as well as providing engagement, starting from the long waiting time to receive the newly-purchased car.

BRAND DIGITAL PLATFORM*

For luxury car customers and fans who want to digitally and immersively experience the luxury brand, the

digital platform is the digital environment that gives the possibility to explore and interact with the brand.

*The brand digital platform is addressed as such and not as "metaverse" because, as tackled in the chapter dedicated to understanding the metaverse, the full vision of the metaverse is decades away. For now, it embodies a directional shift for the long term. Therefore, for this five-years timeframe, it will be addressed as digital platform.

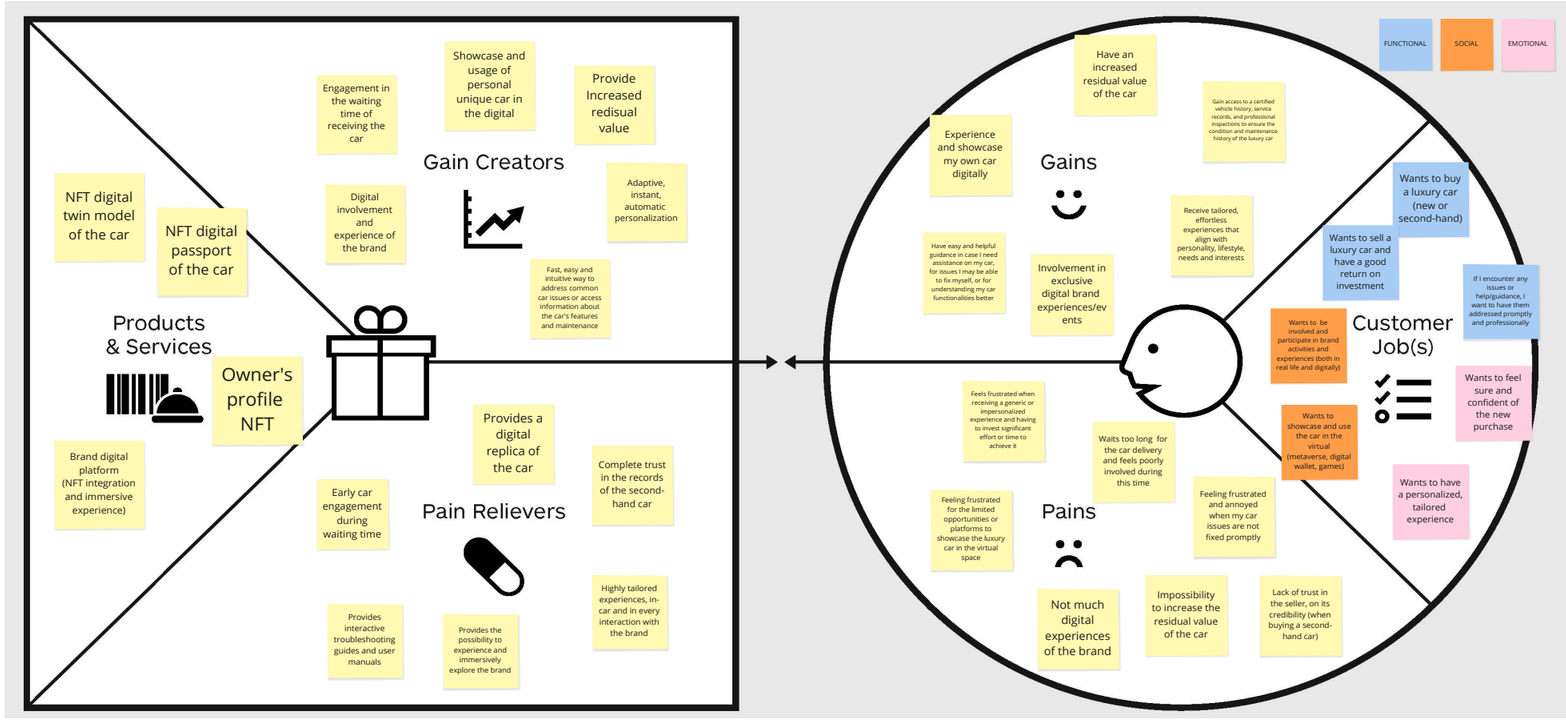


Figure 14, Value proposition Canvas

2.2 Products Definition

From the value proposition canvas it was possible to work on a more detailed description of the products. Given that the products don't interact only with other digital touchpoints, it was decided to divide their key characteristics in digital, phygital, physical, as well as providing a more in-depth description of each product.

OWNER'S PROFILE NFT

For those luxury automotive customers seeking a truly personalized journey, the Owner's Profile Token stands as a unique representation of individuality. This unique customer token contains the distinct preferences and interests of its holder, assisting in a versatile and transferrable personalization across every interaction with the brand. This extends beyond in-car settings to include all features of brand engagement, fostering confidence in the vehicle purchase through custom recommendations and tailor-made On-Demand Configuration Features (ODCFs).

The Owner's Profile Token functions as an exclusive identifier, housing details ranging from preferred car configurations and interaction preferences to stylistic likings and broader interests. When detected, whether through sensors or login credentials, the token seamlessly triggers an alignment of brand touchpoints, experiences, content, and recommendations with the unique preferences and interests of the holder. As an example, the token signals the user's proximity to the car, intuitively pre-loading personal settings before the driver takes the wheel. This level of personalization extends not only across the brand's vehicle range but also encompasses partnered luxury car services and lounges, adapting harmoniously to the holder's tastes.
Acknowledging the shared use of the owner's car among family members, additional profile tokens can be generated. This ensures each user experiences instant personalization, mitigating conflicts in in-car preferences.

The token, in essence, delivers in-car adaptive personalization, extends personalization seamlessly across all brand touchpoints, grants access to exclusive community interactions, and unlocks bespoke experiences and loyalty rewards for its holders.

Key Characteristics

In the digital realm, the token leverages blockchain technology for data integrity and traceability. Smart contracts shape it into a non-fungible token (NFT) with dynamic capabilities (dNFT, dynamic NFT), allowing real-time updates and metadata additions. Access to modify the NFT's metadata is permissioned, guarded by verification mechanisms to ensure data accuracy. Furthermore, the backend employs AI algorithms, continuously refining and adapting the data based on evolving individual preferences.

In the realm of the phygital, the token seamlessly tailors experiences across physical touchpoints (like cars, marketing materials, dealerships, lounges, events, etc) and digital touchpoints (like digital platform, digital communications, etc). Moreover, real-time synchronization ensures that changes or customizations made by the user reflect immediately in both physical and virtual realms.

On a physical level, the token connects with the holder's phone, detecting proximity and adapting touchpoints accordingly. For added security, especially concerning the vehicle, additional consideration is given to incorporating biometric authentication measures.

NFT DIGITAL PASSPORT OF THE CAR

Functioning as a modern counterpart or supplement to the conventional physical log book, the Digital Passport is essentially a distinctive token intricately linked to the car. Its core purpose lies in securely and transparently recording certified car information, ensuring data integrity and authenticity. This involves essential details from the time of purchase, including the owner's information, model, configuration, numbered car parts with provenance, and any special features present. Additionally, it comprehensively captures usage information, spanning additional accessories, optional purchases, maintenance, fixing, upgrades, servicing, updates (including over-the-air updates), and mileage.

Key Characteristics

In the digital realm, the token leverages blockchain technology, assuring the integrity and traceability of the data. This allows both customers and potential buyers a seamless access to an unaltered, comprehensive history of the vehicle. The smart contract governing the digital passport is designed to accommodate the dynamic and evolving nature of vehicle data. Implemented as a non-fungible token (NFT) with an associated logic supporting updates and additions to the token's metadata (dNFT, dynamic NFT), it ensures that while metadata can be updated, the original information remains immutable, preserving a complete and verifiable history. Moreover, access to update or modify the NFT's metadata is thoughtfully permissioned, integrating verification mechanisms to ensure data accuracy. This involves a controlled and certified network, comprising OEMs, dealerships, service centers, and other pertinent entities, assuring that maintenances, updates, and modifications occur within a trusted framework.

On a physical level, the integration of additional information onto the token requires a new workflow and seamless integration into the existing processes of the involved parties.

NFT DIGITAL TWIN MODEL OF THE CAR

Tailored for luxury car customers seeking a digital way to both experience and showcase their luxury cars, the Digital Twin emerges as a distinctive virtual counterpart. This unique model offers a faithful and immersive digital representation of the actual physical car, providing not only a means of virtual utility but also an engaging experience during the waiting period for the delivery of their newly-purchased luxury car.

At its essence, the Digital Twin serves as a unique token that digitally represents the owner's car, designed for digital use (metaverses and gaming environments).

Key Characteristics

In the digital realm, the token makes use of blockchain technology to endure data integrity and traceability. Its smart contract is structured to adapt to the dynamic and evolving nature of car data, accommodating digital add-ons, accessories, and other updates. Implemented as a non-fungible token (NFT) with an associated logic supporting continuous updates and additions to the token's metadata (dNFT, dynamic NFT), it ensures a seamless evolution of the digital twin. Access to update or modify the NFT's metadata is thoughtfully

permissioned, secured by verification mechanisms to ensure data accuracy.
Moreover, these digital twins find their place as integral components linked to the owner's digital wallet, collectively forming a certified virtual garage within the brand's digital platform. Furthermore, they serve a purpose in diverse virtual environments, including partnered metaverses and games, delivering unique experiences and features tailored to the specific car model. Furthermore, the creation and maintenance of these digital twins necessitate the OEM's commitment to a high-quality 3D modeling and rendering system, ensuring an authentic virtual representation. The digital twin also allows a range of add-on integrations, offering a wide range of customization options to personalize and enhance the virtual model.

To bridge the realms of the physical and digital, the luxury OEM can provide a distinctive QR code designed to be applied to the car. This QR code, when scanned by people people who spot it (even on the street), seamlessly directs them to the owner's virtual showcase of their digital twin. This innovative approach establishes a tangible connection between the physical manifestation of the car and its virtual counterpart, enhancing the owner's ability to share and showcase their digital twin to a wider audience in an engaging and accessible way.

BRAND DIGITAL PLATFORM

This digital platform represents the world of the luxury brand, offering users the flexibility to navigate it immersively, via extended reality devices, or through the convenience of mobile or web interfaces. It stands as a platform to meet the digital aspirations of both fans/ casual users and devoted customers.

Within the platform, every user is given many possibilities. Guided tours through the virtual brand museum, revealing an array of models, from the latest releases to heritage models and exclusive digital creations. Events, including product launches, inviting users to participate in firsthand experiences of the brand's latest offerings. The production lines are displayed, offering an insight into the brand's hand-crafted processes, while behind-the-scenes content unveils the narrative and craftsmanship behind each creation. Users also have the possibility to purchase digital brand merchandise (NFTs).

Exclusive to profile token holders (customers), the platform gives a range of privileges. Private token-gated areas unveil a virtual community, an immersive journey into their car's production advancement, a private garage showcasing owned digital twins, and a dedicated remote service area. Furthermore, exclusive events, such as car previews and unveil celebrations, can strengthen the bond between the brand and its customers. Additionally, access to unique digital merchandise, from digital twin add-ons to accessories, provides a distinctive touch. Moreover, the opportunity to showcase one's car digital twin within the virtual brand museum provides a mark of distinction for the customers. Last but not least, troubleshooting guides and interactive user manuals elevate the ownership experience, offering valuable insights and support.

Key Characteristics

In the digital realm, the platform includes a curated NFT marketplace, using blockchain technology for secure transactions. Users also seamlessly access the platform through their digital wallets, providing a secure and personalized gateway. Indeed, the platform dynamically responds to the profile token and other NFTs within the user's digital wallet, shaping the environment to deliver a bespoke and engaging experience. Advanced data analytics and machine learning algorithms are used to analyze user preferences and behaviors, ensuring precise and continuous personalization of the platform to capture evolving individual characteristics.

In the convergence of the physical and digital realms, the platform encourages an immersive experience through extended reality, spanning augmented reality to virtual reality interactions. This emphasis on sensory-rich experiences would signify a commitment to offering users a holistic and captivating digital journey with the brand.

2.3 Chapter Conclusions

Starting from the persona (from the previous value mapping chapter), it was possible to identify the new and compelling value propositions which led to defining the related products. The products definition will serve as the base for the next phase of pathway mapping, to identify the requirements for the business development and build the steps for the horizons in the roadmap.

Indeed, the products definition gives an answer to the second main question of the project "What could be the added values that luxury brands give to their customers through the use of blockchain technology trends?".
In fact, the products definitions are the result of the comprehensive analysis done to identify the benefits and products to deliver based on the persona's profile.

Below a recap summary of the identified products.

The Owner's Profile NFT stands as a personalized customer token, offering adaptive and transferable personalization for luxury car owners. It captures and represents the owner's preferences, from in-car settings to brand interactions, ensuring a seamless and tailored experience.

Complementing this, the NFT Digital Passport of the Car introduces a transparent and certified record of a vehicle's history. This digital passport, linked to the car, holds details from VIN numbers to maintenance records, increasing the car's residual value and giving confidence in the second-hand car purchasing process.

Taking the digital evolution further, the NFT Digital Twin Model of the car represents a unique virtual replica of the owner's car. Designed for immersive experiences, this digital twin allows owners to engage with their cars in virtual environments, from metaverses to games. It embraces blockchain technology and advanced 3D modeling, offering a personalized and customizable digital representation of the vehicle.

At the center of this digital ecosystem lies the Brand Digital Platform, a digital environment catering to luxury car customers and fans. Offering immersive exploration through extended reality or traditional web interfaces, this platform becomes a virtual setting for brand enthusiasts. It spans guided virtual museum tours, virtual car launches, behind-the-scenes content, and even the purchase of digital brand merchandise. For profile token holders (that is, customers), the platform unlocks a realm of exclusive features, from private token-gated areas to participation in exclusive events and access to troubleshooting guides.

All together, these products leverage blockchain, advanced 3D modeling, and extended reality to assist in a new era of digital luxury experiences. From personalized profiles and comprehensive vehicle histories to virtual replicas and immersive brand interactions, these innovations would redefine the boundaries between physical ownership and digital engagement, setting a new standard for the luxury automotive industry.

CHAPTER 3

Pathway Mapping

Ultimately, the phase of pathway mapping is meant to the deliver the final roadmap. That is, an overview of the major guidelines on how the identified products could be implemented, starting from the horizon 1 (current situation, 2024) and arriving to horizon 3 (the future situation, 2029), which aims at the future vision.

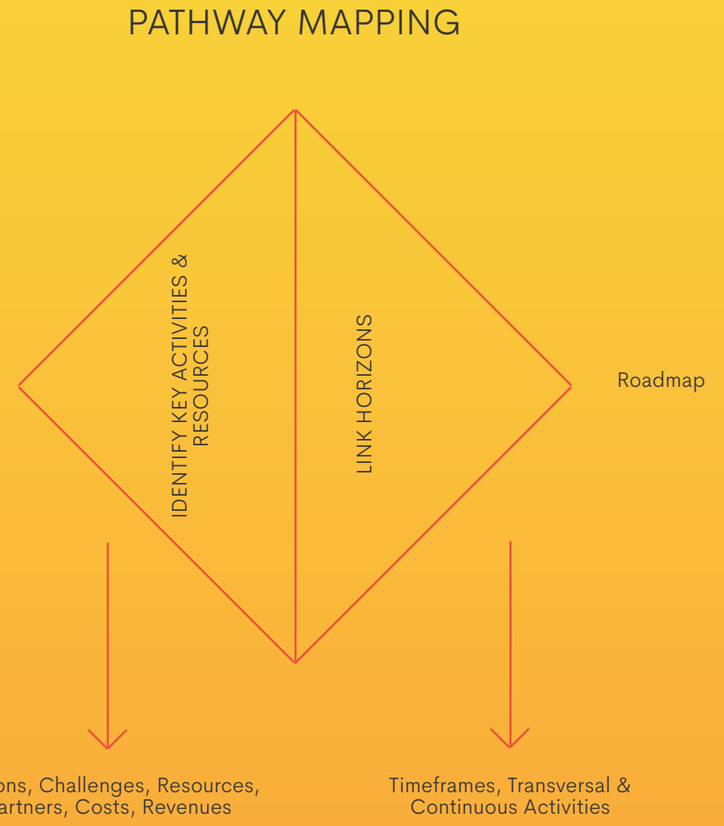
Pathway mapping begins with the identification of key activities and resources. This step starts by outlining a future journey map, which starts from the basis of the current journey map (figure 8), incorporating the products defined in the previous section (idea mapping) and the jobs-to-be-done of the value proposition canvas. The outcome of this phase includes the delineation of actions, challenges, and the establishment of the resources and partners. Serving as foundational elements, these outputs contribute to the subsequent construction of the business model canvas and the overall roadmap.

Indeed, the subsequent phase of pathway mapping involves the crafting of a business model canvas. It was chosen to use these tools in this order because the journey map gives a foundation for the identification of further business requirements in the business model canvas – as seen from the book 'This is Service Design Doing' by Stickdorn et al. (2018): "The upper seven building blocks of the Business Model Canvas are directly connected to the previous basic service design tools"; in this case, the journey map.
In fact, starting from drawing upon the foundations laid by the future journey map, the business model canvas also assimilates information from the value proposition canvas, incorporating elements such as value propositions and customer segments. The resulting output comprises a comprehensive overview detailing the cost structure, revenue streams, and an understanding of how the OEM can effectively create, distribute, and accumulate value.

An important step in the pathway mapping stage is the generation and linking of horizons and its activities. Defined within a distinct timeframe divided into three horizons, this step involves the elaboration of the horizons and their thematic focus. The subsequent identification of transversal and continuous activities across products and timeframes facilitates the organized structuring of actions and challenges within these three horizons.

Pathway mapping ends with the formulation of the final roadmap, which gathers and showcases the future vision, horizons, activities, identified challenges, requisite resources and partners, and the associated costs and revenues. This final roadmap thus stands as a strategic guide, encapsulating the synthesized essence of the envisioned products.

Since the project has mainly relied on desk research, it was decided to include a last step of validation sessions done with luxury automotive professionals, in order to gather their thoughts and suggestions on the concepts and the roadmap.



3.1 Identification of Key Activities and Resources

3.1.1 Future Journey Map

The future journey map starts with the adoption of the current journey map as its basis. On top of that structure, additional categories have been introduced. Indeed, Stickdorn (2018) states that "Journey maps can be enhanced by a variety of optional lanes. The lanes outlined in this chapter are just some examples without any claim to comprehensiveness. Which ones are useful depends on the subject matter of the project, and often lanes must be altered to serve the project's purpose." The additional categories are: actions (business and technical), challenges (business and technical), resources/partners, values (for OEM and for customers). As of the filling-in of the future journey map, it considers the products defined in the previous section (idea mapping) and the jobs-to-be-done of the value proposition canvas.
The outcome of this map includes the delineation of activities, challenges, and the establishment of the resources/partners. Serving as foundational elements, these outputs contribute to the subsequent construction of the business model canvas and the overall roadmap.

In this evolved journey map, the integration of new digital products enhances each phase with a refined layer of engagement and enriched experiences.

Beginning with the **awareness and consideration** stage, as customers start their journey the brand digital platform invites them to virtually explore and immerse themselves in the brand's offerings. Virtual events and product launches become pivotal, providing an immersive look into new releases and innovations. The introduction of profile tokens elevates personalization, offering adaptive customization in the platform based on individual preferences.
To achieve this, the business strategically implements a robust content strategy, providing localized experiences, and encouraging the adoption of profile tokens. Simultaneously, technical efforts focus on constructing a scalable platform, refining social platforms integration, and deploying algorithms to tailor content. Challenges, both in terms of user engagement and the technical infrastructure's robustness, underscore the dynamic nature of this initial phase.

The following **acquisition** stage highlights a focus on personalization and engagement. Indeed, engaging with a digital twin becomes an integral part of the customer experience, offering a unique connection during the waiting period. Plus, the profile token ensures a personalized and tailored experience, building trust and confidence in the purchase.
Expert consultations, engaging experiences, and seamless touchpoint integration represent important business actions. On the technical side, the emphasis is on ensuring cross-platform consistency, refining personalization algorithms, and integrating with order confirmations. Challenges span maintaining awareness and accuracy among evolving customer preferences and data privacy regulations.

Moving to the **delivery and use** stage, customers anticipate prompt and professional assistance,

augmented by immersive guidance about their cars. The digital passport securely stores the complete history of the vehicle, providing a transparent record for potential resale or trade-in. Moreover, scheduling and managing service appointments are streamlined, facilitated by the digital platforms and the brand's tailored experiences. For this step, secure data management becomes a priority, presenting challenges in integrating with dealer workflows and navigating legal regulations while ensuring accurate data management.

The **loyalty and advocacy** stage unfolds with enhanced community engagement facilitated by the profile token and digital platform. Exclusive VIP experiences, personalized loyalty programs, and transparent communication become instrumental in deepening customer connections. The business fosters community engagement, provides personalized loyalty programs, and actively communicates with customers. This stage aims to increase not only customer loyalty but also advocacy. On the technical side, data analytics play a crucial role in understanding customer preferences and ensuring privacy. Moreover, challenges involve sustaining increased customer loyalty, adapting to market dynamics, and effective customer communication.

Last but not least, the final **car selling or buying** stage undergoes a paradigm shift with a focus on personalization and transparency. Indeed, the digital passport providing a certified record of the vehicle's history instills confidence, catering to both sellers and buyers. Personalized recommendations based on preferences and driving habits become a hallmark, enhancing the overall experience. The business focuses on ensuring data accuracy, providing personalized recommendations, and overcoming challenges related to security and privacy. Technically, secure blockchain and NFT technology, collaboration with legal experts, and data analytics contribute to overcoming challenges related to security, privacy, and market adaptation.

As of the values that these new products create, on the one hand, for OEMs this integration cultivates an enhanced brand image, positioning them as industry innovators. The data from these new products offer valuable insights, focused on the existing customers but also on the second-hand ones and on the fans' interacting with the brand (in the digital platform). Moreover, the integration of these NFT products and of the digital platform has the potential to differentiate the OEM from competitors and to increase sales conversions.

Customers, on the other hand, enjoy a distinctive and personalized journey from awareness to ownership, fostering confidence and trust. Moreover, the digital twin and profile token empower customers to extend brand engagement beyond physical boundaries, creating a lasting and meaningful connection. In essence, this integration aligns with evolving consumer expectations, crafting a journey characterized by innovation, trust, and enduring brand loyalty for both OEMs and customers.

This comprehensive journey that displays the incorporation of the identified products, shows the potential positioning of luxury automotive at the forefront of meaningful and superior digital, integrated experiences. The strategic interplay of business actions and technical advancements results in a journey that has the potential to set new standards in the luxury automotive landscape, as it was outlined in the future vision.

The extensive future journey map can be found in Appendix E.

3.1.2 Business Model Canvas

The next step of pathway mapping involves the crafting of a business model canvas (Osterwalder, 2010).
As previously stated, the business model canvas builds from the journey map information: actions (for the key activities block), resources/partners (for the key resources and partners block), touchpoints (for the channels block). While, for the key propositions and customer segments block, the information generated from the value proposition canvas (see figure 15).
The resulting output comprises an overview detailing the cost structure and revenue streams (needed for the roadmap), and a comprehensive understanding of how the OEM can effectively create, distribute, and collect value.

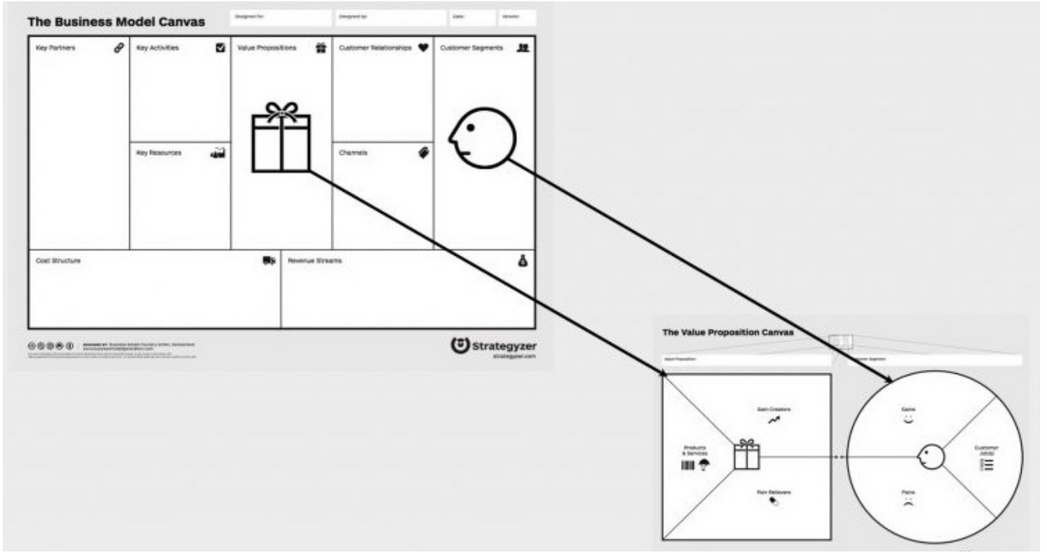


Figure 15

As it was also seen from the journey map, at the heart of the OEM's strategy is the creation of a dynamic ecosystem to deliver meaningful and superior digital, integrated experiences. This not only elevates the customer experience but positions the OEM as a visionary player in the industry, cultivating a robust and forward-thinking brand image.

When it comes to value distribution, the OEM leverages an array of channels, ensuring broad exposure. From the digital platform to social media, official websites, and physical locations like dealerships, every touchpoint is optimized for customer engagement. Moreover, indirect channels such as word-of-mouth and customers' social media naturally foster brand advocacy.

Revenue generation extends beyond traditional car sales, involving digital merchandise, virtual events, and the sale of additional profile tokens (for the customer's family members). Furthermore, value also lies in the insights derived from aggregated data that is collected, guiding monetization strategies.

The backbone of the OEM's operations consists of key activities such as the identification of the right partners to develop these products that are outside of the core business. Moreover, as it was already outlined in the future journey map, other key activities involve IT service management, legal assessments, marketing, content creation, and continuous products development. These activities need to be supported by a robust resource pool, including NFT specialists, digital platform experts, legal and compliance teams, data scientists, and financial backing.
Moreover, strategic partnerships with technology providers, 3D modeling specialists, event managers, and other collaborators contribute significantly to the OEM's success.

In terms of costs, the OEM needs to allocate resources thoughtfully across human resources, legal considerations, infrastructure, tax/administrative needs, marketing, operations, consultancy, data analytics, and blockchain costs. This careful cost management ensures the sustained and efficient execution of key activities, aligning with the complete strategy of the business model.

In summary, the OEM's effectiveness in creating, distributing, and collecting value is evident in its seamless integration of digital technologies, strategic partnerships, and diversified revenue streams. This approach not only fuels innovation within the luxury automotive sector but also positions the OEM as a brand that resonates with the expectations of its customers.

The extensive business model canvas can be found in Appendix F

3.2 Link Horizons

An important step in the pathway mapping stage is the generation and linking of horizons and their activities (Simonse, 2017). The horizons on a roadmap can be considered as fundamental building blocks for achieving the future vision.
The horizons have been outlined each with a dedicated and significant focus/theme. These themes are each developed based on the previous horizon(s), making the roadmap dependent and making it necessary to look back at the previous result when moving to a new horizon.
The horizons have been developed through the 'three horizons' model (Simonse, 2017), which gives indication to start by depicting the horizon 1, then the horizon 3 and, lastly, horizon 2 as the bridge between the two previous ones.

This model gives indication to start by depicting the horizon 1 as an enhancement of design value. That is, "enhancing design value to current product lines" (Simonse, 2017). For this, given that these new products are not related to the core business of luxury OEMs, it was considered to begin by laying the groundwork, with an initial structuring to establish these products. Therefore:
HORIZON 1 (2024); Theme: BUILD THE FOUNDATION

Following with horizon 3, as stated by Simonse (2017) for this step, "the third horizon captures a strategic scenario with a state of growth on the long run. [...] The future vision is the end point of this innovation scenario", the future vision was taken in consideration to elaborate on horizon 3. Future vision:
"In 2029, luxury OEMs can lead the way in delivering meaningful and superior digital, integrated experiences, by harnessing blockchain technology"
First of all, it can be seen that meaningfulness was delivered by having the alignment (or fit) between the customer (persona) and the offered products (done in the idea mapping phase, in particular, through the value proposition canvas). Then, considering the luxury industry, the superiority is given by the high personalization ("tailor-made approach" seen from the SWOT analysis in the value mapping phase), which is present in every identified product and that of course needs to be ensured in every touchpoint. Indeed, not only for the personalization, this is valid also for all the aspects of the products, which need to be well integrated (this is the aim of this horizon). Therefore:
HORIZON 3 (2029); Theme: FULL ECOSYSTEM INTEGRATION

The second horizon falls between the other two, therefore, given that horizon 1 focuses on building the foundation for the products and that horizon 3 aims at achieving maximum ecosystem integration, horizon 2 involves refining existing initiatives and introducing new elements, leading to an enhancement of the overall customer engagement. Therefore:
HORIZON 2 (2026); Theme: ENHANCE CUSTOMER ENGAGEMENT

As a next step of this phase, there is the identification of the transversal and continuous activities across the new products and timeframes. That is, identifying those activities than need to be persistent overtime, as well as pertaining to all four products.

Considering both the first part of pathway mapping which focused on the identification of key activities and resources (through the journey map and business model canvas) and considering also the horizons, the activities shown in the next first paragraph were identified as transversal for the products (for laying the foundation in horizon 1), while the ones shown in the second paragraph were considered both transversal for the products and continuous across horizons.

In l**aying the foundations for horizon 1**, a series of activities should be considered essential.
First and foremost, the establishment of dedicated teams and enhancement of specialized IT resources stand as key activities, as the products are not core business-focused. This involves the selection and cultivation of teams specifically tailored for the successful execution of the projects.
Linked to this is also the importance to identify and engage with the right technology partners or providers, those specialized in the delivery and maintenance of these new products (digital platform, digital NFT passport, etc). This involves a meticulous selection process to align with partners who can not only meet but exceed the technological requirements of the envisioned products.
Furthermore, establishing the foundational infrastructure is also a needed activity in horizon 1. This involves the creation of the essential framework that supports the seamless functioning of the products. From robust server systems to data storage capabilities, this infrastructure forms the backbone for these innovations. This should be done with the support of the selected technology provider, with whom the
blockchain technology will also be adopted.
Simultaneously, addressing legal requirements stands as a foundational step. Indeed, the implementation of legal measures ensures compliance and establishes a secure and legally-secured framework for the development and deployment of the products. This includes navigating any regulatory landscapes and ensuring adherence to industry standards.
In essence, by doing these activities that address technological partnerships, legal compliance, and foundational infrastructure, the foundations for the successful implementation of the new products can be fortified.

On the other hand, several are the **activities to consider throughout the horizons and across the overall projects**.
First of all, there should be the investment in training and skill development programs for employees, which emerges as a forward-looking measure, as the products are not core business-focused. This ensures that the workforce remains at pace with the evolving technologies and industry best practices, aligning the organization with the forefront of innovation.
Then, to foster a seamless integration of efforts, cross-functional collaboration becomes paramount. The organization must actively work to break down potential silos between departments, ensuring alignment and synergy. This collaborative approach not only enhances efficiency but also promotes a holistic understanding of the project across the organization.
Furthermore, transparency and the cultivation of trust emerge as foundational principles. Indeed, open communication with customers and users regarding data usage and security is critical, given that the products deal with sensitive data.
To measure progress effectively, defining and monitoring KPIs aligned with the various stages of the customer journey is essential. These metrics serve as quantitative benchmarks for success, aiding in strategic decision-making.
Indeed, leveraging analytics is also considered a continuous process essential to improvement. In fact, the use of analytics allows for iterative enhancements and the

delivery of superior experiences and products. Customer feedback plays a crucial role in this iterative process. Indeed, actively incorporating feedback into updates ensures the product remains attuned to user needs and preferences.
Linked to this, maintaining resource flexibility is also a strategic activity. The ability to scale resources based on user adoption, feedback, and evolving market conditions is a dynamic response to the fluid nature of the project environment.
In essence, a collaborative synergy, ongoing skill development, transparent communication, strategic measuring, continuous improvement, and adaptability are important components for the projects to be successful from horizon 1 until horizon 3.

The outcomes of these activities ("3.1 identification of key activities and resources" and "3.2 link horizons") facilitate the subsequent organized structuring of elements within the roadmap (done in the next chapter).

3.3 Chapter Conclusions

Pathway mapping ends with the formulation of the final roadmap. This is given by the outcomes of the previous stages, organized in horizons and aiming at the future vision. Indeed, the roadmap gathers and showcases the outcomes from the previous steps done: horizons, activities, identified challenges, needed resources and partners, and the associated costs and revenues. The roadmap thus stands as a strategic guide, encapsulating the synthesized essence of the envisioned products and their implementation.

Indeed, the roadmap gives an answer to the third main question of the project "In relation to the added values, what would an integrated strategy look like in a roadmap?" In fact, the roadmap is the result of the comprehensive analysis done from the previous steps.

STRATEGIC AND TACTICAL ROADMAP

Two roadmaps, namely a tactical and a strategic one, have been developed.
The tactical roadmap outlines the necessary actions and their respective timelines, in order to achieve specific outcomes. It goes into a certain degree of detail, however, as the project lacks a direct association with a specific company, the tactical roadmap does not go in too much detail on the operational level and internal processes that you would have if the project involved a company.
On the other hand, the strategic roadmap provides a visual representation of the essential elements within each horizon and illustrates the trajectory toward the ultimate future vision.

The roadmap description in the next pages is related to the tactical roadmap, as it holds all the information of the final deliverable and since the strategic roadmap is used to provide a summarized and more visual version.
The actions, challenges, resources and partners derive from the future journey map (3.1.1), while the costs and revenues come from the business model canvas (3.1.2). Lastly, the timeframes and the transversal and continuous activities to consider throughout the horizons derive from the step of link horizons (3.2).

Strategic Roadmap

HORIZON 1: 2024

Build the foundation

01

Laying the groundwork for an initial structuring to establish the new products, given that they are not related to the core business of luxury OEMs.

- Digital Platform to be introduced with pilot digital-specific experiences, a marketplace, and a private area for Profile Token holders.
- Digital Passport to launch in a basic version for ownership verification, collaborating with key dealerships.
- Digital Twin to ensure an engaging digital experience for customers, through automatic generation upon order confirmation
- Profile Token to be launched for personalization of email communications, website and app.

HORIZON 2: 2026

Enhance customer engagement

02

Refining existing initiatives and introducing new elements, leading to an enhancement of the overall customer engagement.

- Digital Platform to include the full vehicle lineup, live events, localized content, user-generated content tools, and XR features for immersive experiences.
- Digital Passport to include a broader array of services, such as the inclusion of maintenance records.
- Digital Twin to increase configurability (virtual-only add-ons) and integrate XR features for engaging experiences.
- Profile Token to become more comprehensive and sophisticated, recognizing its user across more brand touchpoints and initiatives (dealerships, lounges, boutiques, events, loyalty programs)

HORIZON 3: 2029

Full ecosystem integration

03

Achieving maximum integration and providing unparalleled, seamless customer experiences across various products and platforms.

- The Digital Platform to be a multi-player environment, integrated with third-party digital and gaming platforms, and offer enriched private area of Profile Token holders (schedule and manage service appointments and have interactive troubleshooting guides).
- Digital Twin to ensure interoperability for cross-platform use
- Profile Token to be allow seamless and tailored experiences also in the car, to provide in-car personalization and recommendations, and collect real-time driving preferences and behavior.

TACTICAL ROADMAP

	2024 HORIZON 1	2026 HORIZON 2	2029 HORIZON 3	FUTURE VISION
HORIZON THEME	**BUILD THE FOUNDATION** Laying the groundwork	**ENHANCE CUSTOMER ENGAGEMENT** Refining existing initiatives and introducing new elements	**FULL ECOSYSTEM INTEGRATION** Achieving maximum integration and provide unparalleled customer experiences	
ACTIONS & ❗CHALLENGES technical *business* — Transversal & Continuous Actions	• *Training and skill development: Invest in continuous training and skill development programs for employees to keep up with evolving technologies and industry best practices* • *Fostering cross-functional collaboration: to avoid potential silos between departments, alignment and synergy across the organization has to be assured* • *Transparency and building trust: transparently communicate to customers and users how their data is used and secured* • *Measuring success through KPIs: define and monitor KPIs aligned with the customer journey stages* • Leverage analytics: use analytics to iterate and deliver better experiences/products • *Feedback incorporation: actively incorporate customer feedback into improvements and updates* • *Resource flexibility: maintain flexibility in resource allocation to scale up or down based on user adoption, feedback, and evolving market conditions*			
	• *Build a new dedicated team and improve specialized IT resources* • *Find the right partners/providers (specialized in the product)* • *Implement legal requirements* • Establish the foundational infrastructure			
DIGITAL PLATFORM	- Launch **pilot** digital-specific experiences and marketplace, as well as customer private area (token-gated) *- Foster dedicated **customer communities**, allowing customers to connect and share their ownership experiences* ❗ **Technical difficulties**, like platform access problems, can frustrate users, potentially impacting the overall experience ❗ Ensure delivering **high content quality and quantity,** managing user expectations from a luxury brand ❗ *Maintaining **consistency in branding, messaging, and content** requires careful oversight*	- Include the **full vehicle lineup** (both current and heritage models) - Offer **live events and new areas (also localized experiences)** to explore within the platform as well as User-Generated Content Tools for customer engagement - Integrate additional **XR engaging features**, based on evolving technology - Make use of algorithms and systems that analyze the profile token data to **deliver personalized** engagement, content and recommendations to customers *- Craft a **rich content strategy** with updates, virtual events, and interactive experiences to keep users engaged (e.g., collaboration with other luxury brands and artists)* ❗ Extending **compatibility** to various devices and platforms while maintaining a seamless experience poses technical and design challenges ❗ If the **content and recommendations don't align** with the token holder's preferences, disappointment may arise	- Transition to **multi-player** environment for collaborative experiences - Develop **integrations with third-party** digital and gaming platforms - Leverage advanced AI and machine learning for **highly tailored content** - Allow customers to schedule and manage **service appointments** within the platform - Provide **interactive troubleshooting guides** - Adapt metaverse content to **suit various regions and cultures**, delivering a globally appealing experience *- **Explore partnerships** with technology companies for cutting-edge platform features and to enable cross-platform interactions* ❗ Building and maintaining a **multi-player infrastructure** that can handle a large number of users is a significant technical and financial challenge ❗ ***Maintaining user interest and engagement** in the platform over time can be challenging*	By harnessing blockchain technology, luxury OEMs are leading the way in delivering meaningful and superior digital, integrated experiences
DIGITAL PASSPORT	- Launch **pilot** digital passport for ownership verification *- Collaborate with **key dealerships*** *- **Promote the benefits** that the digital passport gives to the customer, emphasizing its impact on resale value* *- **Issue loyalty points** that can be converted and used within the brand to incentivize dealerships to record the services, etc. done, as well as also incentivizing the customer to stay updated and keep up with the needed maintenances, etc.* ❗ *Integrating digital passport into **dealership's processes and systems** can pose resistance and logistical challenges* ❗ *Ensuring that customers are aware of and understand the benefits of the digital passport can be challenging, especially for owners of older generations*	- Extend the digital passport to **include maintenance records** *- **Conduct checks** to ensure dealers and service partners maintain updated and synchronized digital passports* ❗Expanding the digital passport to include maintenance records requires a **standardized system across dealerships**		
DIGITAL TWIN	- Ensure the digital twin is **automatically generated** and provided to customers upon order confirmation ❗ *Ensuring that the digital twin is **continuously synchronized** with any changes or customizations made by the customer post-order placement requires robust data management systems and efficient processes*	- Expand digital twin's configurability with **more digital-only options** - Develop **XR integration** for immersive experiences	- Ensure **interoperability** for cross-platform use *- Develop **partnerships with third-party** digital platforms to establish transversal digital use* ❗Standardizing NFTs for **interoperability** across digital platforms is a complex technical challenge ❗Integrating with third-party platforms while **maintaining the brand's identity and experience** is complex	
PROFILE TOKEN	- Create a **customer profile system** that integrates with the CRM and collects data from web2 and web3 - **Personalize easy existing assets** through the basic profile token (e.g., email communications) - Enable **token-gated community** engagement for customers to share experiences and recommendations *- **Promote the benefits** that the profile token gives to the customer* ❗*Gaining **customers' trust** to share their data for personalization without infringing on privacy is crucial.* ❗*Ensuring that customers are aware of and understand the benefits of the profile token without **hesitating on the sharing** of their data can be challenging* ❗Maintaining **accurate personalization** based on the profile token's data can be challenging, as customers' preferences and interests may evolve over time	- Implement **token recognition systems** in all brand touchpoints - Enable **manual data entry by dealers and event managers** for offline customer interactions - Continuously **refine and improve** the personalization algorithms and features enabled by the profile token - Use customer data from the profile token to **personalize communications**, digital platform and **launch loyalty programs**, exclusive events - Ensure that the personalizations from the profile token data remain **consistent across all touchpoints** ❗ *Keeping customers engaged in loyalty programs requires **innovative incentives***	- Allow **seamless and tailored cross-platform experiences** across all customer touchpoints (online and offline). Expanding profile token functionality to include **in-car** personalization and recommendations - Collect and analyze real-time **driving preferences and behavior** and leverage this data on the profile token to provide **personalized service recommendations** (based on the customer's driving habits and vehicle usage) ❗ **Maintaining accurate and up-to-date customer data** within the profile token is a technical challenge, involving data synchronization across various platforms ❗ *Analyzing and using driving behavior data for personalization must **balance privacy and value** to the customer* ❗ ***Maintaining a consistent personalized experience** across various digital touchpoints through the profile token can be challenging*	
RESOURCES	NFT specialists; Digital Platform specialists; IT specialists; Marketing teams; Data Scientists; Legal & compliance team; Customer Support; Financial resources; Hosting Infrastructure and Content delivery networks; Data processing and management systems			
PARTNERS	Technology provider (Digital Platform specialist); Technology provider (NFT tokens specialist); 3D modeling provider; Digital platforms/Games partners (interoperability); Content creation partners; (digital and physical) Event management companies; PR agencies; Luxury mobility services; Luxury lounges; Third-party service providers (maintenance and modifications); Dealerships; Legal and compliance consultants			
COSTS & REVENUES	Human resources; Legal; infrastrucutre; Tax & Administrative; Marketing; General Operations; Consultancy; Data Analytics; Blockchain cost Car sales; Sales of digital merchandise and virtual events; Sales of aggregated data from profile tokens and digital passports; Sale of additional profile token (for family member)			

HORIZON 1 - BUILDING THE FOUNDATION

Theme

To start, given that the new products are not related to the core business of luxury OEMs, it is important that the first phase is dedicated to laying the groundwork, with an initial structuring to establish these products.

Actions and challenges

The Digital Platform begins its journey by launching a pilot for digital-specific experiences, including a marketplace and a private area for token-holders. These early adopters form dedicated customer communities where luxury ownership experiences are shared and celebrated. Nonetheless, the platform faces the technical challenges of ensuring smooth access and managing the high expectations for content quality and quantity that meets the high standards expected from a luxury brand. It demands meticulous oversight to maintain brand consistency in messaging and aesthetics across all digital interactions.

The Digital Passport is introduced via a pilot to establish ownership verification, with a collaboration with key dealerships to support its launch. From this first phase, by offering loyalty points (to both the dealership and the customer) the brand incentivizes consistent engagement and maintenance. Indeed, this is needed especially for the dealerships as the integration in their processes and systems can pose resistance and logistical challenges, and also for the owners of older generations who may be less tech-savvy and unable to easily grasp the benefits, at least in the beginning.

For the Digital Twin, the strategy is to ensure that a digital replica of the purchased car is generated automatically upon order confirmation. This requires a robust data management system to maintain synchronization with any post-order changes made by the customer, presenting a significant challenge in keeping the twin accurate and up-to-date.

In this first phase, the Profile Token aims to create a comprehensive customer profile system that feeds into a CRM and gathers data from both Web2 and Web3 sources. Providing personalized customer engagement through existing assets like email communications, website and app is an early goal. However, gaining customer trust to share their data for such personalization, while also ensuring that they understand the benefits of this sharing without compromising their privacy, is a delicate balance that must be met. Furthermore, ensuring that personalizations remain accurate over time as customer preferences evolve adds to the complexity.

To support these digital initiatives, activities across all products include building specialized IT teams, finding the right technology partners, and establishing the legal and infrastructural groundwork necessary for success.

HORIZON 2 - ENHANCE CUSTOMER ENGAGEMENT

Theme

Having built a good foundation, the second horizon should focus on refining the initiatives (many of the products have been launched with a pilot or basic version) and introducing new elements, leading to an enhancement of the overall customer engagement.

Actions and challenges

With the foundational elements in place, the focus of the Digital Platform now shifts to enriching the customer experience by including the full vehicle lineup and offering new areas and experiences such as live events and localized content, leveraging user-generated content tools for enhanced engagement. Furthermore, by integrating additional XR features and using algorithms to analyze profile token data, the platform can deliver unique and more personalized engagement to its customers.

Additionally, investing in a rich content strategy in this phase will ensure engagement and relevance of the platform (like collaborating with other luxury brands and artists to create exclusive virtual events and interactive experiences).

The platform must now manage the challenge of ensuring compatibility across various devices without compromising the seamless nature of the experience. It should also be ensured that content and recommendations are aligned with the token holder's preferences, otherwise disappointment may arise and brand reputation may be affected.

The Digital Passport evolves to encompass a broader array of services, such as the inclusion of maintenance records. In this phase where the Digital Passport gets richer with information, consistent checks are necessary to ensure that all partners are synchronizing records correctly. The challenge lies in achieving a standardized system for maintaining these records across all service partners and dealerships.

With the Digital Twin, enhancing its configurability (offering digital-only options) and developing XR integrations paves the way for more engaging and immersive experiences.

The Profile Token now becomes more complete, through the implementation of token-recognition systems at all brand touchpoints and enabling manual data entry by dealers for offline interaction. This phase also includes refining personalization algorithms and ensuring consistency in customer experiences, using the token data to further personalize communications with the customer and launch loyalty programs based on customer profiles. Keeping the personalization algorithms and features up-to-date and relevant is an ongoing challenge, as is maintaining customer engagement with loyalty programs that require innovative incentives.

HORIZON 3 - FULL ECOSYSTEM INTEGRATION

Theme

Now that the products are more developed, the final steps towards a fully integrated ecosystem can be taken. The last horizon is all about providing unparalleled, seamless customer experiences across various devices and platforms for the luxury customers, but also the luxury OEMs, to benefit from them.

Actions and challenges

In the final horizon, the Digital Platform transitions into a multi-player environment, integrates with third-party digital and gaming platforms, and leverages advanced AI and machine learning for highly content customization. Moreover, to deliver a superior and globally appealing experience, there is the development the metaverse content's adaptation to suit various regions and cultures. In this stage, the OEM should also explore partnerships with technology companies for cutting-edge platform features and to enable cross-platform interactions. Last but not least, the platform also enriches the private areas dedicated to the customers, allowing them to schedule and manage service appointments within the platform and providing interactive troubleshooting guides.
From these activities, some challenges also arise. In particular, constructing and maintaining a multi-player infrastructure that can handle a significant user base is both a technical and financial challenge. Moreover, keeping users engaged and interested over time in the platform will require constant innovation.

The Digital Twin now aims for interoperability across different platforms, encouraging the use of NFTs for a standardized digital experience, which itself represents quite a complex technical challenge. Indeed, to establish a transversal digital use, OEMs should develop partnerships with third-party digital platforms. To also keep in mind is the significant challenge of requiring

seamless integration that still preserves the brand's unique identity and experience.

For the Profile Token, the strategy is to enable seamless and tailored experiences across all customer touchpoints (online and offline). This includes expanding functionality to in-car personalization and recommendations, leveraging on real-time data from driving preferences and behavior to provide personalized service recommendations.
This ambitious approach demands an accurate and up-to-date profile that synchronizes across various platforms, consistently providing personalized experiences across various digital touchpoints. Last but not least, a crucial challenge is the balancing of privacy considerations with the delivery of value (superior personalizations) to the customer.

TRANSVERSAL ELEMENTS THROUGHOUT THE HORIZONS

As the roadmap progresses through the horizons, a set of transversal and continuous elements need to be taken into account. These play a vital role in shaping the roadmap, transforming the luxury experience into something that transcends the physical and embraces the digital.

Activities

Investment in employee training and development is a continuous activity throughout this journey. Indeed, recognizing that human capital is as critical as technological innovation, the OEM should commit to equipping its team with the latest knowledge in evolving technologies and industry practices. This is not just an investment in skills, but a strategic move to keep the organization agile and informed.
The threat of departmental silos emerges in any multidimensional organization, especially one undergoing a significant shift. To mitigate this, a strong emphasis should be placed on alignment and synergy. Each department, whether they are developing NFTs or crafting customer experiences, must move jointly, synchronizing their efforts to the overarching objectives of the company.
For these projects especially, transparency in data usage and security is not only a regulatory requirement but the basis of customer trust. Communicating with customers about how their data is safeguarded and utilized supports the commitment to privacy and builds confidence in the digital products being offered.
The mapping of Key Performance Indicators (KPIs) to stages of the customer journey ensures that success is measurable and aligned with customer satisfaction. This is especially important given that the products introduced by the OEM are new to the company. The KPIs, alongside robust analytics, should have a fundamental role, guiding continuous improvements to both experiences and products.
Central to this evolution is the voice of the customer. Indeed, actively incorporating customer feedback into product updates and improvements ensures that the digital offerings remain relevant and resonant with the target audience.
Flexibility in resource allocation is a strategic act of balance, allowing the OEM to dynamically scale operations in response to user adoption rates, feedback, and the evolving market conditions.

Resources

The range of specialists, from IT to those experts in NFTs and digital platforms, forms the backbone necessary to navigate the technical complexities of this digital development.
Moreover, data processing and management systems need to be available to aggregate and anonymize the vast quantities of data, ensuring efficiency and privacy.
Indeed, legal and compliance teams are also a necessity for the company's ethical and regulatory responsibilities, while financial resources are the basis on which all operations stand. On the data side, data scientists are

also needed to dive into the analytics to extract insights for fueling personalization and innovation.
To ensure seamless customer experiences, a robust infrastructure (hosting and content delivery networks) will also need to be in place.
Last but not least, marketing teams and customer support are needed to play their roles in crafting the company's image and responding to customer needs.

Partners

Strategic partnerships are essential to the brand's ecosystem, with technology providers specializing in digital platforms and NFTs offering the necessary technical expertise. Moreover, the collaboration with 3D modeling providers, digital platform and gaming partners, and content creators helps strengthen the offerings of the OEM, opening new possibilities for immersive experiences.
Event management companies, PR agencies, and luxury mobility services extend the brand's reach into both digital and physical realms. The network of partnerships also extends to third-party service providers, luxury lounges and dealerships, each adding a layer of sophistication and service to the brand's offerings.
Lastly, given the new domains which are not linked to the core competences and knowledge of the company, a partnership with legal and compliance consultants will be needed.

Costs

The financial variety of this digital evolution is complex. First of all, human resources and legal considerations need to be taken in accounting. Infrastructure and technological platforms require significant funding, while marketing and general operations are ongoing expenses. Consultancy and data analytics are critical investments in bringing insights and strategies essential for growth. Last but not least, the blockchain use brings its own set of costs, with gas fees associated with NFT transactions.

Revenues

With the introduction of the new products, the revenue streams become diverse. Car sales remain the basis, while sales of digital merchandise and virtual events open new revenue channels. Moreover, the aggregation and sale of data from profile tokens and digital passports present a novel source of income, leveraging the value of this gathered data while respecting privacy. Additionally, the sale of additional profile tokens, for example for family members of the customer, offers a personalized expansion of the OEM's digital engagement.

In envisioning the future of luxury OEMs in 2029, the roadmap unfolds as a journey toward delivering superior digital, integrated experiences. By strategically embracing blockchain technology, luxury OEMs can position themselves at the forefront of innovation. Indeed, the horizons, from building robust foundations to full ecosystem integration, can pave the way for a new era in the luxury automotive industry. If luxury OEMs are able to navigate towards this path, the promise of meaningful and superior digital experiences can become a tangible reality, shaping the landscape of automotive luxury in the digital age.

3.4 Validation Sessions

Since the project has mainly relied on desk research, it was decided to include a last step of validation sessions done with luxury automotive professionals, in order to gather their thoughts and suggestions on the products and the roadmap.

PARTICIPANTS SELECTION

For the validation sessions, five participants were recruited through purposive sampling, balancing differentiation in professional role and expertise.

- **Customer Journey Manager,** because has good knowledge on the luxury customers
- **NFT & Metaverse Product Manager**, because has good knowledge in blokchain, NFT, Metaverse for luxury automotive
- **IT Application Architect**, because has a technical background and deals with the integration and implementation of digital solutions
- **Digital Marketing Manager**, because is in charge of digital innovation and has marketing knowledge
- **After Sales Strategy & Requirements Manager**, because has a strategic view and knowledge in after sales

INTERVIEW APPROACH

To create an in-depth understanding of the perception of the products and the roadmap by luxury automotive professionals, qualitative research is the most effective method (Myers, 2009). The interviews lasted about one hour and were semi-structured. The complete interview guide can be found in Appendix G. The interviews were audio recorded and transcribed, making it possible to structure and analyze the raw data carefully. The topics discussed in the interview are the following:

1. Their impressions on the products (value propositions) + the main things needed and barriers for implementing
2. Their view on the products' value potential and implementation barriers
3. Their thoughts on the implementation steps

These topics were used as guidance during the semi-structured interviews.
Since the goal was to gather the interviewees' feedback, and not create a theory (grounded theory methodology, for example) a precise qualitative analysis method has not been followed.
Information on the interview process can be found in appendix G.

The insights that emerged for each topic discussed with the professionals is reported in the following section. Pratt (2009) states that the data should be shown in a clever and organized way, either in the body of the paper and tables or through "power quotes". Therefore, for each product, the power quotes have been included.

LEGEND ON THE ROLE OF THE PERSON TO WHOM THE QUOTES BELONG TO:

- Customer Journey Manager
- NFT & Metaverse Product Manager
- IT Application Architect
- Digital Marketing Manager
- After Sales Strategy and Requirements Manager

1. IMPRESSIONS ON THE PRODUCTS (VALUE PROPOSITIONS) and things needed and barriers for implementing

DIGITAL PLATFORM:

The feedback on the Digital Platform presents a multifaceted perspective. Key points include the potential of digitalization to transform physical experiences into unique digital formats, with emphasis on maintaining exclusivity and scarcity in digital content. Challenges like the cost-effectiveness of new technologies, the company's willingness to adopt these technologies, and the importance of a strategic approach were highlighted. Technological hurdles, such as hardware limitations and the need for accessibility across various devices were identified as significant barriers. The platform's success was seen as dependent on strategic commitment and investment from top management.
Physical discomfort caused by VR technology, especially motion sickness, and the ergonomic challenges of using VR headsets were raised as concerns, alongside the technical and financial barriers in implementing VR.
The evolving nature of user interactions in the digital space, particularly the increasing reliance on mobile devices, was noted. The need for a balance between technological advancement and user accessibility was emphasized, with a suggestion to optimize the platform for both mobile use and more powerful platforms like VR and PCs.
Finally, the platform's potential to engage a broader audience beyond existing customers was recognized, with caution advised for the alignment of the digital platform with the luxury brand's exclusive positioning.

Quotes:

- "It's difficult to replicate the scarcity and exclusivity of physical events in the digital environment, but it's crucial for maintaining brand prestige"
- "The first barrier is definitely the hardware I mean the technology at the moment... the technology is still far away. So the experience is not yet up to par... it's difficult to access it especially with a mobile device...".
- "In my opinion there is the feeling of nausea that can occur with more dynamic content..."
- "Regarding the digital platform the main thing to consider is that today a large portion of users primarily use mobile devices (cellphones)"
- "It could be interesting to introduce them to the brand in a more playful virtual digital way that allows them to get closer to the brand and dream about it in the future"

DIGITAL PASSPORT

The Digital Passport is seen as a potential game-changer in enriching the ownership experience, particularly through the addition of storytelling and emotional aspects of the car in the passport. There was a consensus on the need for dynamic and continuously updated certification, leveraging blockchain for a comprehensive and evolving record of a vehicle's history.
Operational challenges, especially around blockchain decentralization and authority for updates, were highlighted. The necessity of changing industry practices and customer behavior for adoption is also emphasized.
Concerns are raised regarding technological robustness, data security, and the need for educating both customers and sales networks about its value and functionality.
Cultural barriers in its acceptance and the importance of customer education were also pointed out.
The potential for new marketing opportunities and customer engagement through unique use cases, like cross-brand collaborations, was said. However, challenges in data management, privacy concerns, and the need for a structured, collaborative approach towards implementation were also highlighted. The suggestion of a pilot project before full-scale rollout was recommended to refine the system.
In essence, the feedback underscores the Digital

Passport's potential in enhancing customer experience and providing innovative marketing opportunities, balanced with the need for careful consideration of technological, operational, and cultural aspects.

Quotes:

- "Remember that our cars being luxury objects interact with the world. When you have the artist moving with your product that product is part of the artist. These combinations of visibility work well... to enrich the car's passport with stories... therefore the emotional part of emotion"
- "...but does it have to be decentralized on the blockchain? Who makes the approvals?... Being decentralized it can't be just the dealer you know? This is a bit of my question".
- "...and on the other hand, it also brings value to us, the company, because it gives one more reason for the customer to be loyal to our official dealer network. Maybe those in the network would be the only ones with the tools to effectively and easily write inside the NFT."
- "It's essential to prepare adequate documentation for the entire sales and after-sales network... it needs to be explained properly".
- "Another example is suggesting a new exhaust system to someone who has installed a certified exhaust on their vehicle, providing an opportunity for re-marketing, etc."

DIGITAL TWIN

The Digital Twin concept is widely seen as a valuable asset, not only mirroring its physical counterpart but also potentially surpassing it in terms of value and significance. This value is enhanced by the Digital Twin's ability to generate revenue and embody a symbol of aspiration. Professionals recognize its utility for both car owners and fans, offering interactive experiences across various digital platforms, including video games. However, there are concerns about the technological challenges and the need for realistic solutions to ensure successful implementation.

An innovative approach suggested involves the Digital Twin evolving alongside the car's production process, keeping customers engaged and offering access to exclusive services and experiences. This could extend the relationship between the customer and the brand. The synergy between the Digital Twin and other digital products like the Digital Passport is also emphasized, enhancing customer engagement and brand value. Strategic planning and alignment with broader brand objectives are crucial, along with incorporating gamification elements to appeal to diverse customer bases.

Overall, the Digital Twin is viewed not just as a digital representation but as a key element in a larger business strategy, capable of providing ongoing value to both the brand and its customers.

Quotes:

- "But you know what? We are always there daring. With a digital asset with the digital twin that one receives of a wonderful car, that car can continue to generate dreams, expectations but also revenues. This can be the meaning of a digital twin".
- "Also here I would say the hardware because the promises are beautiful but the reality is another thing... The technology must respect somewhat the promises otherwise there is a risk of scoring an own goal again as Meta did last year who made proclamations and then could not do anything of all that they said"
- "For example my idea is that as soon as you confirm the order of our car which now takes years to deliver the NFT in a first version could be version 1.0 of the digital passport of the car. It could then evolve as the car is assembled and delivered becoming maybe a version 2.0 when you have the car to access services".
- "I wouldn't view it merely as a digital replica; I would see it as a business proposition".
- "Regarding the requirements for implementing the digital twin it's crucial to determine if there's a gamification strategy behind it possibly as a way to approach the metaverse".

PROFILE TOKEN

The feedback on the Profile Token highlights the token's ability to enhance customer experience and loyalty through personalized digital experiences and data-driven services. The insights underscore the importance of balancing customer data usage with privacy concerns, with a focus on transparency and customer value.
The integration of the Profile Token with emerging technologies and the digital platform is seen as a bridge between physical and digital luxury automotive experiences, enhancing customer engagement and brand loyalty.
Concerns are raised about legal aspects of data tracking and the necessity of explicit customer consent. The potential for collaboration with other luxury brands and the practical utility of the Profile Token in storing customer preferences are also highlighted. However, skepticism exists regarding the practicality and necessity of linking the token to blockchain technology, with some viewing it as the weakest among the presented products due to concerns about its utility tied to this product and relevance in the luxury segment, risking to flatten the customer experience and not providing emotions that is a typical aspect of the luxury segment.
Overall, the feedback presents a comprehensive understanding of the complexities involved in implementing the Profile Token effectively in the luxury automotive industry, emphasizing personalization, legal and privacy challenges, and the need for a robust digital infrastructure.

Quotes:

- "So this product could have something interesting and even marketable... It can lead to greater ease of use, greater ease of repurchase, and greater loyalty".
- "Yes more than that you know what? The wallet could also be interesting if you have experiences with other brands..."
- "I could carry the same skin which then opens up a secondary market issue for artists because maybe Louis Vuitton wants to make the skin for model X and with a partnership between Louis Vuitton and the luxury automotive brand Louis Vuitton makes you the skin with its beautiful pattern with LV..."
- "The value isn't in the blockchain; the value is in how well that card is profiled."
- "To implement the profile token, one of the essential things to do would be to conduct a sensitivity analysis."

GENERAL CONSIDERATIONS

Throughout the interviews, I received some general considerations related to the integration of digital technologies in the luxury automotive industry. These are reported in this section.
Key themes include the importance of exclusivity and scarcity in digital and virtualization initiatives, the value of digital enhancements in augmenting physical experiences, and the need for digital elements to have a physical counterpart to succeed. The feedback also highlights the role of digital technologies in evoking emotional connections and memories, which are crucial in the luxury sector.
The challenges and opportunities in adopting new technologies were discussed, comparing the automotive industry's approach to that of fashion houses, which are much more daring when it comes to trying with new technologies and projects. The need for courage and vision in experimenting with digital innovations was emphasized, acknowledging the cultural barriers of the sector for the implementation. The importance of data valorization and the need for integrated technology systems to provide a holistic customer experience were also mentioned. Another feedback was given on the necessity of simplicity and immediate utility in digital innovations, and the risks of cultural ignorance of customers in misunderstanding digital products.
These insights shed light on the complexities and potential strategies for successful digital integration in the luxury automotive sector.

Quotes:

- "In my opinion, the common thread, regardless of the various activities you have hypothesized, should always be exclusivity and scarcity in the world of luxury, in the world of luxury automotive, we always work on these bases. So, everything that is digital, everything that is virtualization, which on one hand can become democratization of the asset because at that point it becomes theoretically accessible to everyone, must return or must be designed to be exclusive to create scarcity, regardless of the activity."
- "Like in all things, novelty always generates a bit of resistance. Because, and I go back to the really cultural aspect of the type of industry, complex manufacturing industries like automotive, which is the most complex of all, struggle to take risks because the cost of failure is very high. But I really don't find other barriers... then in the implementation of new technologies many suppliers enter this world and some know how to do it, some don't. That's a risk to take but not a barrier."

2. THOUGHTS ON THE PRODUCTS' VALUE POTENTIAL AND IMPLEMENTATION BARRIERS

An overview can be given on the perception had by each professional that was interviewed in relation to the difficulty of implementing the product (low-high) and the potential value it can bring to the business (low-high). Below is an overview for each product. The single maps can be found in Appendix G.

DIGITAL PLATFORM

The general conclusion from the mapping of the digital platform suggests that it is viewed as the easiest to implement compared to the other products. However, opinions vary significantly when it comes to its potential value to the business, with some interviewees seeing it as offering the highest potential value, while others see it as having low to medium-low value. Despite the ease of implementation, the perceived value it brings to a business is not consistently high across the feedbacks received.

DIGITAL PASSPORT

The general consensus from the mapping of the digital passport is that it is considered to have high potential value for the business, with some viewing it as the highest among the products evaluated. However, the difficulty of implementation is a notable concern, with opinions ranging from being the most difficult to implement to having medium-high implementation challenges.

DIGITAL TWIN

The general conclusion drawn from the mapping of the digital twin is that it is seen as having high potential value for the business, with some interviewees ranking it equally with the digital passport in terms of value. In terms of implementation, while there are some concerns, it is generally considered to be easier to implement than the digital passport and at times, as easy as the digital platform. However, there is a variance in perception, with some views indicating medium potential value and medium difficulty in implementation. Overall, the digital twin is recognized for its valuable contribution to the business with a moderate level of implementation challenge.

PROFILE TOKEN

From the mapping of the profile token it can be seen that some interviewees see it as having significant potential value, comparable to the digital passport, while others view it as the least valuable among the four products. In terms of implementation, the views range from it being

the easiest to implement to having many barriers, with some considering it more challenging than the digital platform. Overall, the profile token's business value is acknowledged, but there is a clear variance in opinions regarding its ease of implementation.

In the next chapter, the difficulties of implementing each product are detailed.

3. IMPRESSIONS ON IMPLEMENTATION STEPS

DIGITAL PLATFORM:

The feedback on the implementation of the Digital Platform starts with a focus on foundational elements for developing a 3D model and immersive environment. There's an emphasis on launching an NFT campaign for initial community building and engagement. A beta version for early feedback from 'web 3 natives' is appreciated, alongside a timeline that includes community creation and foundation building. The idea of integrating a full lineup of vehicles and transferring the entire brand into the digital world, including factories and museums, is values, though there's caution about the complexity of achieving interoperability among different platforms.

There's skepticism about the 2029 timeline for full implementation, with suggestions to advance critical aspects to around 2026, especially for multiplayer aspects. The importance of securing partnerships early and presenting the project demo as soon as possible is stressed, alongside the need for a cost-benefit analysis and having a complete vehicle lineup at launch. Finally, a customer-first, inside-out approach is suggested, focusing initially on exclusive features to enhance brand exclusivity and then engaging the fan base. The platform is considered a new channel in the integrated marketing strategy, with a need to ensure brand message consistency across all platforms and align the digital platform's value proposition with the luxury brand's positioning. There's a suggestion to start revenue generation through fan engagement and emphasize service and customer experience elements in the platform.

Quotes:

- "... so what can be done first is an NFT campaign, where car models are sold as NFTs, which can later enter the three-dimensional environment. So, there's a small step before creating the immersive 3D world, which is the creation and distribution of NFTs and building a community. Start pre-launch activities to engage more people, create awareness, build a community, use social channels, use Discord, use different platforms."
- "It's not easy to achieve, as everything is already included. If you have to create customized environments or other things, it could become complicated, and I'm not sure if it's worth it – it's a cost-benefit analysis, especially concerning costs because there would be many variables... but it's worth exploring."
- "In other words, this becomes a new channel where the brand's message must be consistent with all other channels. I don't think it would work if the brand communicated in a slightly more youthful, informal manner on this platform, but there was no consistency on other channels. I see this more from a marketing perspective."

DIGITAL PASSPORT:

For the Digital Passport, concerns are raised about motivating customer data registration and the decentralization aspect, questioning the appropriateness of centralized dealer-centric approval processes. The potential for integrating the digital passport with the digital platform is recognized, enhancing collaboration opportunities and enabling immersive visualization of vehicle information. The rapid evolution of blockchain technology is highlighted, stressing the need for adaptability and constant updates throughout the development process to leverage the latest innovations. indeed, the importance of ongoing processes is emphasized, with suggestions for continuous checks on dealerships and servicing partners, and maintaining

awareness of blockchain developments. Also, an overall more enriched roadmap is suggested, starting from aligning the roadmap with the business's current state and conducting thorough technological and business assessments, so then being able to prioritize use cases based on ease of implementation and impact, and exploring long-term use cases within the blockchain ecosystem, such as brand collaborations and certifying driving styles. Flexibility in scheduling and adapting to the business's current state are seen as crucial for successful short-term implementation.

Quotes:

- "The friction points make sense to me. The issue of the Dealer/customer relationship is really critical. Firstly, motivating the customer to register data..."
- "This point, along with the dealership verification, are two continuous lines that run from the first day to the last day of the project. Until the project closes, you must stay updated on everything, and throughout the entire process, you must conduct maintenance, ensuring that everything is up to date with the dealerships... this is a process that, in my opinion, should be contractually shared with the dealers."
- "However, this roadmap heavily depends on the current state of the business. It begins with a technological and business assessment. If the technological assessment reveals that data is readily available and easily certifiable, for example, in the case of a luxury automotive brand starting with mileage data on new vehicles, which is easily extractable and verifiable, the roadmap should be based on ease of implementation and impact."

DIGITAL TWIN:

The feedback on the implementation of the Digital Twin begins with a focus on infrastructure development and the creation of a digital XR environment, with a vision for the Digital Twin to integrate within an immersive digital world, aligning with the Digital Platform. Emphasizing interoperability, the potential for cross-platform integration, such as with popular gaming platforms, is recognized as a key phase. The establishment of interoperability standards is seen as crucial, with a focus on creating universally applicable developments. The real business potential is identified in expanding accessories and special digital configurations, emphasizing the importance of gamification and unique digital configurations. Moreover, promotional efforts and collaborations are underlined as essential for success, with suggestions to start interoperability initiatives and secure partnerships earlier to maintain a competitive edge and for the financial sustainability of the project. Additionally, the potential for short-term partnerships in gaming is noted, alongside the need for a technological assessment to ensure the digital twin's consistency with the actual car configuration. The insights underscore the importance of a continuously updated catalog, early project initiation, and a focus on financial sustainability and continuous evolution.

Quotes:

- "So, I would say that interoperability between platforms should be capable of at least being achieved in the first step, in my opinion. Because theoretically, you should be using a standard that the platforms define, or at least a standard that you would want the platforms to use... which ultimately means just connecting various wallets through interfaces. So, I would say that the standard should be one of the first things, because if it's not the standard, then everything you want to develop... you're building a castle on sand, practically, because if you're developing without a standard... the best thing would be to have a standard to make what you're doing usable everywhere, so you do one development and not multiple."
- "But there too, perhaps I would secure a partnership right away, because then you work on enriching it. Of course, this doesn't mean that everything will flow right from the start of the project, but within a few weeks, it should, because otherwise... this project is great, it's fantastic, but it could risk being poor."
- "So, there is also a technological assessment to be carried out, whether I am capable, in terms of processes and certification, of certifying the vehicle's configuration on the blockchain, or if my internal production or configuration systems are not able to do so. For instance, the customer may have the correct car, but my production system may say 'customized orange,' which may not mean anything in the context of a different 3D

render compared to reality. This also depends on technological considerations."

PROFILE TOKEN:

The feedback on the Profile Token implementation begins with a focus on customer-driven interactions and automation, using QR codes for easy token updates and automatic adaptation to customer preferences using real-time data. It was suggested to focus on automation, integrating Profile Token functionality with current systems and processes, so reducing manual tasks of data entry for dealers. This could involve automatic updates to customer wallets based on events attended, captured in existing databases. Indeed, the idea of a family of NFTs for different experiences was proposed, transforming the Profile Token into a digital wallet for various uses. It was also suggested a change in terminology, referring to it as a personal wallet rather than a token, for easier customer interaction.

Furthermore, the importance of legal compliance in customer profiling is highlighted, along with the suggestion to use smart contracts for creating NFTs that contain metadata for in-car personalization. There was an emphasis on the synergy between the Profile Token and the Digital Passport, advocating for a consistent strategy across both. Moreover, the potential of car personalization linked to vehicle connectivity was underlined, stressing the importance of understanding the maturity level of the vehicle connectivity platform of the brand. Lastly, it was highlighted the dependence of the Profile Token strategy on the brand's current status and its relation to the Digital Platform strategy.

Quotes:

- "Preferences can also be non-verbal. For example, the preference can be automatic, like if you're in the car, the car can understand that you prefer off-road mode, or it sees you always going to the beach and taking the route to the Adriatic Riviera, and consequently adapts. It's not necessarily manual where the Dealer has to ask 'what do you prefer to do?'. No, the data can be downloaded in real-time. I imagine an NFT, a token that adapts based on what the customer actually does."
- "So, the only things I would change here... Let's say the first point, which is about establishing a profile of our customer... more than that, it's about legally understanding how to profile the customer. I would change it like that, to be sure."
- "The high-value-added aspects are certainly related to car personalization, which can be linked to the car's connectivity. Here, it's crucial to understand the maturity of your own vehicle connectivity platform."

GENERAL CONSIDERATIONS

Throughout the interviews, I received some general considerations related to the general implementation timeline of the products. These are reported in this section.

Some concerns were expressed about the return on investment timeline, suggesting that the benefits may be too distant in time, potentially beginning only around 2026 or later. It was recommended reconsidering the duration of the proof-of-concept phase, proposing that it could be shorter. Additionally, the risks associated with leadership changes were highlighted, which could impact project support and continuity. So there was the suggestion to have a strategy akin to a satellite launch, emphasizing rapid initial growth to reach a sustainable 'orbit' quickly. This approach would allow for early project sustainability, with growth and expansion occurring once a stable base is established. The advice was to focus on reaching this 'orbit' between 2024 and 2025, then maintaining momentum by bringing in data and users to refine the products.

Quotes:

- "In general, you've done a good job, but sometimes, in my opinion, it lacks relevance to reality, grounded in a context where someone has to give you money, I mean a lot of money,

and then you don't see the return on investment for a while because it only starts in 2026, not that you have it in 2026. So, when will you see returns? In 2027? 2028? 2029?"

- "If you think about a company's timeline... Let me give you an example. How often does a CEO or CFO change? There's a risk that you put things in place that you then have to support in front of others... maybe someone else comes in and says, "Sorry, so you've already spent this?" and you say, "Yes, but I was told I could do it because of this and that," and he says, "You know what? The project ends here; close it."... it can happen."

The feedback gathered from the validation sessions was useful to understand the perception of luxury automotive professionals, which can be helpful for further research and for improvements on the project. These can be found in the "Recommendations" chapter.

CHAPTER 4

Conclusions

In this chapter, several sections are included to provide a holistic and academic overview on the project. To start, a conclusion is given to answer the project's primary questions. The discussion touches on the relevance of the research within the academic context. The recommendations go into valuable future research propositions. Then the thesis is wrapped up with a personal reflection.

4.1 Conclusions

In this first section, the three questions defined in chapters 0.1 are answered. These answers are based on the knowledge gained from research of this thesis.

1. What could a future context look like, considering changes in luxury automotive, NFTs, and the Metaverse?

After researching the current context of the main topics of this project, as well as exploring and working on the future context, it was possible to answer to this question through the persona and the future vision. The persona provides a first part of the answer, as it is related to the customer. The persona's characteristics are tied to the future trends, namely the belonging to the generation Z (trend of gen z millionaires), being from China (Chinese expansionism), the strong interest in personalization (tied to the increase of self-expression), the wanted engagement with the brand), the digital-first culture (extremely tech-savvy), and their interest in sustainability (increase in global temperature).

On the other hand, the second part of the answer is given by the future vision, as it is related to the OEM. The future vision is tied to the future landscape as well as taking into account the opportunity areas found from current context research. It provides the representation of a desired future for OEMs, giving a strategic reference point for actionable innovation: In 2029, luxury OEMs can lead the way in delivering meaningful and superior digital, integrated experiences, by harnessing blockchain technology.

2. What could be the added values that luxury brands give to their customers through the use of blockchain technology trends?

With the goal to achieve customer(persona)-product fit, in the project it was possible to define the products definitions. A recap of the specific products:

- The Owner's Profile NFT stands as a personalized customer token, offering adaptive and transferable personalization for luxury car owners. It captures and represents the owner's preferences, from in-car settings to brand interactions, ensuring a seamless and tailored experience.
- Complementing this, the NFT Digital Passport of the Car introduces a transparent and certified record of a vehicle's history. This digital passport, linked to the car, holds details from VIN numbers to maintenance records, increasing the car's residual value and giving confidence in the second-hand car purchasing process.
- Taking the digital evolution further, the NFT Digital Twin Model of the car represents a unique virtual replica of the owner's car. Designed for immersive experiences, this digital twin allows owners to engage with their cars in virtual environments, from metaverses to games. It embraces blockchain technology and advanced 3D modeling, offering a personalized and customizable digital representation of the vehicle.
- At the center of this digital ecosystem lies the Brand Digital Platform, a digital environment catering to luxury car customers and fans. Offering immersive exploration through extended reality or traditional web interfaces, this platform becomes a virtual setting for brand enthusiasts. It spans guided virtual museum tours, virtual car launches, behind-the-scenes content, and even the purchase of digital brand merchandise. For profile token holders (that

is, customers), the platform unlocks a realm of exclusive features, from private token-gated areas to participation in exclusive events and access to troubleshooting guides.

3. In relation to these added values, what would an integrated strategy look like in a roadmap?

Finally, the developed roadmap gives an answer to the third and main question of the project. Indeed, the roadmap is the result of the comprehensive analysis done from the previous steps. The proposed roadmap starts in the first horizon (2024) with building the foundation needed implement and further develop the products. In fact, given that the new products are not related to the core business of luxury OEMs, it is important that the first phase is dedicated to laying the groundwork, with an initial structuring to establish these products. In the second horizon (2026) the planned focus is to enhance the customer engagement: having built a good foundation, the plan is to refine the initiatives (many of the products have to be launched in horizon 1 with a pilot or basic version) and introduce new elements, leading to an enhancement of the overall customer engagement. In horizon 3 (2029), the full ecosystem integration should be reached. Indeed, once the products are more developed, the final steps towards a fully integrated ecosystem can be taken. The last horizon is all about fulfilling the future vision and providing unparalleled, seamless customer experiences across various devices and platforms for the luxury customers, but also the luxury OEMs, to benefit from them.

4.2 Recommendations

Several future research directions and recommendations are introduced in this chapter to improve and anchor the quality and relevance of this thesis. This thesis has relevance for an implementation strategy on a conceptual level. In future projects, valuable additions and new research possibilities can be established from this strategic foundation. Indeed, during the validation sessions some starting points for further development and future milestones can be formulated.

A good addition to this project could be the extension and strengthening of the explorative analysis of the luxury automotive sector by working with a specific luxury OEM. By involving luxury automotive professionals from the specific OEM from the beginning of the project, it could be possible to detect possible additional opportunity areas/gaps and have more depth and a thicker understanding. This would lead to an alignment of the future vision, products and roadmap with the positioning and strategy of the company, as also stated from the luxury automotive professionals during the validation, resulting in a finely tuned project that is even more organizationally embeddable.

When working with a specific company, it should be considered to organize an initial workshop for the professionals to deepen the general knowledge of these new technologies, given it is not a core business for them. Then, for the product's individuation phase, it should be considered to have a workshop with the professionals from the specific luxury OEM company, to have them brainstorm on the possible products to consider, as this would bring richness in information and various product possibilities related to the company's values and strategy.

Additionally, as emerged from the validation sessions' insights, a technological and business assessment of the company should be carried out, to understand the state of the company and then move forward with designing the roadmap, based on the outcome concerning the maturity state of the company's processes, systems and data availability.

Furthermore, it would be an interesting research assignment to prototype, develop and test the products presented in the thesis. This would bring practical

information to the OEM, as well as making them more concretely understand the products. This could be also helpful to the luxury automotive professionals to more efficiently spread the awareness of these products in the company and to share them more easily with other departments, as well as with the top management, to facilitate understanding of how they function.
Indeed, as emerged from the validation sessions' insights, for all the products a complete POC (proof of concept) should be developed to gather data, insights and lessons and see if/how to move forward. A first pilot was already put in the roadmap of this project, nonetheless the professionals pointed out that the majority of these pilots were only a basic version which gets enriched overtime, and this could be risky for the sustainability of the products in the long term.

4.3. Personal Reflection

My graduation project has come to an end and this last section is a wrap up by sharing a personal reflection of my journey.

The reason why I wanted to pursue this kind of project is because I am curious about exploring better the digital sector and how it evolves. I am specifically interested on the blockchain and non-fungible tokens. Given my other interest and connection with the luxury automotive, as I work for a luxury automotive OEM, this project has definitely been a good opportunity to work on these elements together.

As a strategic designer, during the Master I had the opportunity to dive deep in the peculiar competences of strategic designers, such as exploring, reframing and better 'defining' fuzzy areas, and I believe that, in order to improve and acquire more expertise, experience is key. Indeed, this project definitely had all it takes for this. I wanted to strengthen my skills in innovation management and this project has allowed me to gain more practice in those aspects, as its context is quite new and emerging and also because the project did not have a specific initial brief or company. Indeed, the definition of the project direction and research question has felt like the most intricate part to untangle. As I find myself more comfortable in the research part of the projects, the transition to having to elaborate and put all the information together to move on, felt as an obstacle to me. Indeed, I dedicated extensive time and attention to define a direction and understand what the main focus of the project would be as I felt a bit uncertain on how to find it based on the vast topic and not having a specific company to work on. In the end, identifying the right way and methods to carry on the project, also gave me much more confidence in my capabilities as a strategic designer.

During the project, it has been challenging to combine my full- time job and the graduation project, which has impacted my energy level and subsequently my motivation, but I found that taking some time to get back energy and mentality improved my performance and the ongoing project's status. The support of my family also played a big role on this.
Looking back on the timing of the project, at the beginning I also set unrealistic expectations on myself, in fact this brought me an overwhelming feeling, leading to feeling stuck and unable to move forward. Something I learned is definitely to give myself more time, also for possible unexpected events that might come up on the way.

I'm proud I didn't give up and got out of my comfort zone in this journey, I now feel energized for what's ahead!

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