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Sustainability and Innovation in the Business Model: The
Automobile Motorsport Industry

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Introduction

The world of motorsport evolved drastically over the years, changing from a lean organization to a sophisticated global enterprise. The history of Formula 1, endurance racing, and rallying demonstrates how it doesn't just function as a competition, but also as a powerful platform for innovation, research and development, branding, and stakeholder engagement.

This thesis aims to investigate the evolution of the business model of automobile motorsport teams over the past five decades. The framework we are going to use is the Business Model Canvas (BMC), developed by Osterwalder and Pigneur in 2010, that will be applied to both historical cases, like a Formula 1 team from the 70s, and to contemporary manufacturers such as Toyota, Ferrari, and Mercedes. This will highlight how fundamental building blocks of the BMC (Customer Segments, Value Proposition, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, and Cost Structures) have shifted in scope and importance.

A second focal point of this study is the growing importance of sustainability, almost absent in the past, but largely considered nowadays not only as a duty, but also as an opportunity to gain a competitive advantage. Motorsport provides not only entertainment, but also a laboratory for sustainable technologies such as electrification and hydrogen mobility, aligning with regulatory pressures and societal expectations.

The research questions of this thesis will therefore be: How the Business Model of Motorsport Teams evolved throughout the years? How much more important is Sustainability now compared to the past? What Are the Key Implications for the future? We will answer these questions by combining historical analysis with case studies of current leading teams, contributing to understanding the automobile motorsport as a management case that reflects transformations in the global automotive and entertainment sectors.

Chapter 1: Business Model and Business Model Canvas

“A business model describes the rationale of how an organization creates, delivers, and captures value.” (Osterwalder & Pigneur, 2010)

1.1 Business Model History

Business Models have been closely associated with e-business since the rise of the Internet in the late 1990s. (Kodama, 1999) and (Hedman & Kalling, 2003) provide early reviews of the business model concept during the dot-com era and the emergence of the e-business model, while (Fielt, 2013) offers a more recent account of developments. Around 2001-2002, the concept of the business model began to take on a broader meaning in management literature beyond the e-business rhetoric of the initial years. Despite business models still being described as “fuzzy at best” in the words of (Porter, Strategy and the Internet, 2001), Johan Magretta gained attention by defining them as “stories that explain how entrepreneurship works” (Magretta, Why Business Models Matter, 2002). According to Magretta, business models not only illustrate how a firm earns revenue but also address essential questions such as: “Who is the customer?” and “What does the customer value?” (Magretta, Why Business Models Matter, 2002). This emphasis on value from the customer's perspective made a significant impact on prevailing thinking. Furthermore, a fundamental idea behind the business model concept was that it should clarify the firm's unique value proposition and how this proposition is to be implemented. For customers, such “value creation” may involve solving a problem, improving performance, or reducing risks and costs, which in turn may require specific value configurations, including supplier relationships, access to technology, or insights into user needs.

In the late 1990s, the concept of the “business model” became almost synonymous with e-business and the emergence of the “new economy”. The internet introduced an array of new models, and much of the literature on business models from an e-business perspective focused on how to migrate successfully to profitable e-business models. Accordingly, this body of literature often compares the value creation of e-business firms with that of their traditional bricks-and-mortar counterparts. However, the major weakness of many early e-business models was that they overlooked the profit formula or assumed unrealistically optimistic conversion of the web traffic into profit. Not all

internet-based business strategies proved viable, which sparked significant interest in examining how new distribution channels shaped new business structures. (Amit & Zott, 2001) Proposed four dimensions of value creation that must be in place for an e-business model to be profitable: efficiency, complementarities, novelty, and customer lock-in. For instance, Internet-based banking models demonstrate efficiency gains, while e-commerce as a distribution channel has created efficiencies enabling entirely new business models.

During the late 1990s, simply attaching the “dot-com” label to a company often sufficed to signal potential profitability or attract investors. After the tech bubble burst, however, investor behavior shifted dramatically, and the “dot-com” label became a liability. Profit generation became a requirement regardless of distribution channel, leading several scholars to reaffirm that the profit formula must remain a central element of the business model. (Afuah & Tucci, 2001) Identified four main internet revenue models: commission, advertising, markup, and production. (Senge & Carstedt, 2001) Note that “much of what is being said about the New Economy is not that new at all. Waves of discontinuous change have occurred before”. Examples include Henry Ford's revolutionary business model in the automotive industry and Sam Walton's retail model in the 1960s, which combined information technology with location strategies to create large-scale cost advantages. Hal Varian refers to such shifts as “discontinuous innovation”.

Although much of the current focus on business models stems from e-business discussions, the concept is far from confined to distribution channels. Ongoing transformations of inter- and intra-company value chains affect nearly every sector, presenting new challenges to firms. As (Alt & Zimmermann, 2001) observed, “much talk revolves around how traditional business models are being changed and the future of e-based business models”, yet this is only part of the story. Business models remain one of the most discussed yet least understood concepts in management. Adopting a business model perspective serves several purposes: it enables management to organize strategic thinking, clarify objectives, and communicate expectations to employees and technical teams. (Hoerl, 1999) Argued that business models should integrate culture, values, and governance, supporting a shared understanding of business strategy and

objectives throughout the enterprise. Conceptualizing the business model thus involves understanding the entire logic of value creation.

Beyond the traditional value chain, newer value configurations have emerged, reflecting changes in the competitive landscape. As (Sandberg, 2002) observes, industries no longer operate under a single, dominant business model; instead, competition increasingly occurs between competing business concepts (Hamel & Trudel, 2001) rather than solely between firms linked in linear value chains, as described in Porter's 1985 framework. (Porter, *Competitive advantage: creating and sustaining superior performance: with a new introduction*, 1985) When firms in the same industry employ different business models, variations in competencies and knowledge resources shape value creation, and benchmarking standard performance indicators becomes insufficient to assess profitability or growth potential. Evaluating firms thus requires interpretation within the context of their distinct models.

Although the notion of modeling organizations is not new, organizational charts and diagrams have long illustrated departmental relations; a business model extends beyond such diagrams. It encompasses strategy, structure, and the application of technology to create value. Dell exemplifies this integration: its direct sales strategy is supported by a hub-like structure built around information technology, enabling online orders, custom-built PCs, and direct shipping (Magretta, *The Power of Virtual Integration: An Interview with Dell Computer's Michael Dell*, 1998) (Mintzberg & Van der Heyden, 1999) introduced "organigraphs" as visual tools showing how organizations function by depicting interactions among people, products, and information. Organigraphs consist of four components: the set, the chain, the hub, and the web. While the set represents a collection of independent parts, the other three emphasize connectivity: the chain illustrates sequential processes such as Ford's assembly line; the hub serves as a coordination point; and the web captures complex, interactive networks such as teams.

(Chesbrough & Rosenbloom, 2002) Trace the origins of the business model concept back to Chandler's *Strategy and Structure*, (Chandler, 1962) where strategy was defined as determining long-term goals and allocating resources accordingly. This evolution continued through (Andrews, 1971) definition of business and corporate strategy. (Child, 1972) *Work on organizational structure, environment, and performance*,

influenced by Chandler, diagrammatically represented many of the elements central to later definitions of business models. Child's concept of "prior ideology" anticipated today's notions of vision, value proposition, and objectives, while "operating effectiveness" encompassed scale, technology, structure, and human resources. The role of technology has always been pivotal, shaping feasible organizational structures and influencing business design. (Thompson & Udy, 1968) Laid the foundations for examining the impact of technology on business models, distinguishing between long-linked, intensive, and mediating technologies, each contributing differently to value creation.

While business model research has roots in economics, strategic management, and innovation, it has spread into diverse fields. (Hedman & Kalling, 2003) emphasized the e-business and IT perspective, while (Osterwalder, 2004) focused on creating a business model ontology to improve information system design. Beyond IT, the innovation perspective, particularly in new business development and ventures, has driven much of the recent momentum. The concept has also been adopted in auditing, voluntary reporting, corporate disclosure, and communication.

1.2 Business Model Canvas

The framework we are going to use in this thesis to analyze Business Models is the Business Model Canvas, a strategic tool widely used in management that provides a framework to describe, design, analyze, and innovate business models. It was created by Alexander Osterwalder and Yves Pigneur, who introduced it in their book "Business Model Generation" in 2010. It condensates the structure of the Business Model into a one-page diagram built around 9 blocks:

1. Customer Segments: Describes the groups of customers that the company wants to reach and serve. They can be grouped together into one or more big or small Customer Segments if they share a common factor, such as the same needs or behaviors, to be better satisfied. Examples of Customer Segments include:
 - Mass Markets: We have a Mass Market when the business model doesn't make a distinction between Customer Segments, it just focuses on one big group of consumers with similar needs and wants.

- Niche Markets: We have a Niche Market when the business model targets specific and specialized Customer Segments.
 - Segmented: We have a Segmented Market when consumers are divided based on small differences in their needs or wants. The business model then adapts to each different group.
 - Diversified: Similarly to the previous, the customers are divided into groups, but here the differences between them are much more substantial.
 - Multi-Sided Platforms: In this case, the company serves different and interdependent levels of the same supply chain of a product. After this division, the company must decide which one or more segments it wants to serve.
2. Value Proposition: Outlines the collection of products and services that generate value for a particular Customer Segment, the reason why consumers choose one company instead of another, addressing a problem or fulfilling a need. It can be described as a combination, or a bundle of benefits that a company provides. Some of them may be innovative and represent a new and disruptive offer, while others may mirror existing market solutions, but with supplementary features or attributes. The elements that can contribute to the creation of customer value are:
- Newness: Often linked to technology, some Value Propositions address an entirely new set of needs that the customers had not previously had because no comparable offering existed.
 - Performance: The Traditional way of creating value consists of enhancing the performance of a product or service that already exists.
 - Customization: Adapting products and services to the specific requirements of individual customers or Customer Segments creates value.
 - “Getting the Job Done”: Value can be generated simply by assisting a customer in accomplishing specific tasks.
 - Design: It is a significant yet difficult element to evaluate. A product may distinguish itself through a superior design.
 - Brand/Status: Customers may perceive value in the mere act of using and showcasing a particular brand.
 - Price: Delivering comparable price value at a lower price is a frequent method of addressing the needs of price-sensitive Customer Segments.

However, a low-price Value Proposition carries significant consequences for the remainder of a business model.

- Cost Reduction: Assisting customers in lowering costs is a vital means of generating value
 - Risk Reduction: Customers appreciate minimizing the risk they assume when acquiring products or services.
 - Accessibility: Providing products and services to customers who previously lacked access is another way of creating value. This may arise from business model innovation, technological advances, or a combination of both.
 - Convenience/Usability: Enhancing convenience or ease of use can produce significant value.
3. Channels: It explains how a company communicates with and reaches Customer Segments to deliver its Value Proposition. Communication, distribution, and sales Channels constitute a company's interface with the customers, holding a crucial role in shaping their experience. It fulfills several functions, including:
- Creating awareness among customers regarding a company's Value Proposition.
 - Assisting them in assessing it.
 - Enabling them to purchase specific products and services.
 - Delivering them the Value Proposition.
 - Offering support after their purchase.

Channels can be divided into Direct or Indirect ones, as well as into Owned or Partner ones. Identifying the appropriate mix of them to meet the ways customers prefer to be reached is essential for bringing a Value Proposition to market. Owned Channels can be Direct, like the company's sales force or website, or Indirect, such as retail outlets owned or managed by the company. They also generate higher margins, especially direct ones, but may be expensive to establish and maintain. Partner Channels, instead, can be only Indirect and include a wide variety of options, like wholesale distribution, retail, or partner-operated websites. They result in lower margins, but they enable an organization to expand its reach and leverage partners' capabilities. The key is to achieve an equilibrium between the different types,

integrating them effectively to deliver excellent customer experience and optimize revenues.

4. Customer Relationships: It describes the types of relationships a company establishes with specific Customer Segments. A company should define the type of relationship it wants to establish with each of them. They may range from personal to automated and can be driven by several objectives, like acquiring customers, retaining them, or increasing sales. The Customer Relationships required by a company's business model strongly shape the overall customer experience. It is possible to distinguish a variety of categories of Customer Relationships, which may coexist within a company's interaction with a particular Customer Segment:

- Personal Assistance: Founded on human interaction. The customer communicates with a real service representative to obtain support during the sales process or after the purchase has been completed. This may occur on-site at the moment of sale, through call centers, via e-mail, or by other means.
- Dedicated Personal Assistance: It entails assigning a representative exclusively to a specific client. It constitutes the most profound and intimate type of relationship and typically develops over an extended period of time.
- Self-Service: In this type of relationship, a company doesn't maintain a direct relationship with the customer; it just provides all the necessary resources for the customer to serve themselves.
- Automated Services: They combine a more advanced version of self-service with automated processes and can identify individual customers and their characteristics, providing information related to orders or transactions.
- Communities: Are growingly employed to engage more directly with customers and prospects, while also facilitating connections between community members. They enable users to exchange knowledge and solve each other's issues, and help businesses to gain deeper insight into their customers.
- Co-Creation: Consists of moving beyond the traditional customer-vendor relationship to co-create value with customers.

5. Revenue Stream: It represents the cash a company generates from each Customer Segment. Successfully answering the question “For what value is each Customer Segment truly willing to pay?” enables the firm to generate one or more Revenue Streams from each of them. Different pricing mechanisms may be employed by each Revenue Stream, such as negotiation, auctioning, fixed list prices, market-based pricing, volume-based pricing, or yield management. Two distinct types of Revenue Streams may be included in a business model: the first are transaction revenue rising from one-time customer payments, while the second are recurring revenues generated through ongoing payments either to deliver a Value Proposition or to provide post-purchase support. There are several ways to generate Revenue Streams:
- Asset Sale: Arises from selling ownership rights to a physical product.
 - Usage Fees: Derives from the utilization of a specific service. The more a service is consumed, the more the customer pays.
 - Subscription Fees: Arise from selling continuous access to a service.
 - Lending/Renting/Leasing: Derives from temporarily granting customers the exclusive right to use a particular good or service for a fixed period of time at a fee. For the lender, this generates recurring revenues, while renters or lessees benefit from incurring expenses only for a limited time rather than assuming the full cost of ownership.
 - Licensing: Results from granting customers permission to use protected intellectual property in exchange for licensing fees, letting right holders produce revenues from their property without manufacturing a product or commercializing a service.
 - Brokerage Fees: Arise from intermediation services carried out on behalf of two or more parties.
 - Advertising: It is generated through fees paid for promoting a specific product, service, or brand.

Each Revenue Stream may employ different pricing mechanisms. The pricing model selected can substantially influence the revenues produced. There are two principal categories of pricing mechanisms: fixed pricing and dynamic pricing.

6. Key Resources: It outlines the most essential assets required to make a business model function. These resources enable the company to create and deliver a Value

Proposition, access markets, sustain relationships with Customer Segments, and generate revenues. The type of business model determines which resources are needed. Key Resources can be owned, obtained from key partners, or leased from them. They are classified as follows:

- Human: All companies require human resources, but they are especially vital in certain business models.
- Intellectual: They include brands, patents, and copyrights, property knowledge, customer databases, and partnerships, representing increasingly vital elements of a strong business model. Although challenging to develop, once established, they may provide significant value.
- Financial: Some business models rely on financial resources and/or guarantees, including cash, lines of credit, or stock option pools for hiring key employees.
- Physical: It comprises tangible assets such as production facilities, buildings, vehicles, machinery, systems, point-of-sale infrastructure, and distribution networks.

7. Key Activities: Every business model requires a number of Key Activities, since they define the most critical actions a company must undertake to ensure it operates effectively. Like Key Resources, they are indispensable for creating and delivering a Value Proposition, reaching markets, maintaining Customer Relationships, and generating revenues. In addition, their nature differs depending on the business model and can be divided into:

- Production: Activities concerning the design, manufacture, and delivery of a product in large volumes and/or superior quality.
- Problem Solving: It centers on devising new solutions for individual customer problems.
- Platform/Network: Business models that rely on a platform as a Key Resource are primarily driven by platform- or network-related Key Activities. Networks, matchmaking platforms, software, and even brands can serve as platforms. Key activities in this category include platform management, service delivery and platform promotion.

8. Key Partnerships: They define the network of suppliers and partners that enable the business model to function. Companies establish partnerships for various reasons,

and such collaborations are increasingly becoming a cornerstone of many business models. Firms form alliances to optimize their business models, mitigate risk, or gain access to resources. We can distinguish four types of partnerships:

- Strategic alliances between non-competitors.
- Coopetition: Strategic partnership between competitors.
- Joint Ventures for the creation of new businesses.
- Buyer-Supplier relationships to secure reliable supplies.

It is also useful to identify three main motivations for establishing partnerships:

- Optimization and Economy of Scale: The most fundamental form of partnership or buyer-supplier relationship aims to optimize the allocation of resources and activities. It is inefficient for a company to own all resources or perform every activity internally. Partnerships based on optimization and scale are generally designed to reduce costs and often involve outsourcing or sharing infrastructure.
 - Reduction of Risk and Uncertainty: Partnerships can mitigate risk in competitive environments marked by uncertainty. It is common for competitors to cooperate strategically in one domain while competing in another.
 - Acquisition of Particular Resources and Activities: Few firms possess all the resources or carry out all the activities defined in their business models. Instead, they expand their capabilities by relying on other firms to provide specific resources or carry out certain activities. Such partnerships may be driven by the need to acquire knowledge, licenses, or customer access.
9. Cost Structure: It identifies the most significant costs associated with operating under a particular business model. Creating and delivering value, maintaining Customer Relationships, and generating revenue all involve costs. These costs can be assessed relatively easily once Key Resources, Key Activities and Key Partnerships have been defined. However, some business models are more cost-oriented than others. Naturally, costs should be minimized in every business model, but low Cost Structures hold greater importance for certain models than for others. It is therefore helpful to differentiate between two broad categories of business model Cost Structures:

- **Cost-Driven:** Cost-Driven business models emphasize minimizing expenses wherever possible. This approach seeks to establish and sustain the leanest possible Cost Structure, employing low-price Value Propositions, extensive automation, and substantial outsourcing.
- **Value-Driven:** Some companies attach less importance to the cost implications of a particular business model design and instead concentrate on value creation. Premium Value Propositions and a strong emphasis on personalized service typically characterize value-driven models.

Cost Structures can also be characterized by the following aspects:

- **Fixed Costs:** Expenses that remain constant regardless of the volume of goods or services produced. Examples include salaries, rents, and physical production facilities.
 - **Variable Costs:** Expenses that fluctuate in proportion to the volume of goods or services produced.
 - **Economies of Scale:** Cost advantages a business obtains as production output increases. Larger firms, for example, benefit from lower bulk purchasing prices. This, along with other factors, causes average cost per unit to decrease as output expands.
 - **Economies of Scope:** Cost advantages a business gains through broader operations. In large enterprises, for instance, the same marketing activities or Distribution Channels can be leveraged across multiple products.
- (Osterwalder & Pigneur, 2010)

1.3 Sustainability

The activity of humans is more and more producing adverse effects on the environment, creating urgent need to redirect it towards sustainable development. Business has a central role in this transition through process, product/service and technological innovations and innovative business models, since they can generate new technologies and vice versa. It merges economic, social and environmental dimensions into the organization's scope and performance measures, considering the necessities of all stakeholders instead of prioritizing solely the achievement of the owner's or the shareholders' expectations, treating the environment as a stakeholder, and adopting both

a systemic perspective and a firm-level view in shaping how business is conducted. (Bocken, 2023)

The main authority dealing with this matter is the United Nations, that in 2015 developed the 2030 Agenda for Sustainable Development, a blueprint containing 17 Sustainable Development Goals (SDGs) that aim to end poverty with strategies that enhance health and education, reduce inequality and stimulate economic growth, while addressing climate change and protecting the environment. Adopted by all the members, the SDGs are divided into three main pillars:

1. Social Pillar: Focuses on the well-being of people and communities, promoting human rights, equity, access to education and health care, and decent work. Includes 9 Goals:

- No Poverty
- Zero Hunger
- Good Health and Well-Being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Sustainable Cities and Communities
- Peace, Justice and Strong Institutions

2. Environmental Pillar: Dealing with the safeguard and maintenance of the natural environment over time through suitable practices and policies, fulfilling present needs without undermining the availability of resources for the future. It includes 4 Goals:

- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life on Land

3. Economic Pillar: Describes the approach through which economic activities are carried out with the aim to establish economic growth, financial stability, resource efficiency and social equity. It includes 3 Goals:
- Decent Work and Economic Growth
 - Industry, Innovation and Infrastructure
 - Reduced Inequalities

The 17th and last Goal is Partnership for the Goals and it is the only one not included in either of the three pillars. Its aim is to enhance the means of implementation by encouraging cooperation between countries, since the other 16 SDGs cannot be achieved if they act alone. (United Nations, s.d.) (Mangukiya, 2023)

An important concept included inside the idea of Economic Sustainability is Economic Viability, which means that the firm can endure overtime by generating financial results sufficient to cover costs and obligations, fairly remunerate the capital employed and reinvest to maintain or increase the productive capacity (World Bank)

We can consider motorsport as a relevant management case since it demonstrates how a global industry can integrate economic, social, and organizational aspects that mirror the challenges that the managing large-scale enterprises face every day. The motorsport sector has also a huge economic impact, generating €159.2 billion in global gross output and €66.9 billion in total value add in 2019, engaging 2.7 million participants in more than 60'000 events held across 7'200 tracks, venues, and facilities worldwide. It stimulates economic activity across multiple sectors, including advanced manufacturing and engineering, traditional manufacturing, and services. The industry also sustains a wide variety of employment and volunteering opportunities throughout the economy, generating 1.5 million total paid jobs and engaging with 302'000 volunteers in the same year. Its economic significance continues to expand, growing by 90% between 2007 and 2019, when it exceeded the gross total output of the world's 25 smallest nations. (EY-Parthenon, 2021)

Chapter 2: Motorsport History and Evolution

“Since the dawn of time, the human race has been a competitive one. The hunger for victory has led to races on foot, by horse and by boat. When the first automobile was invented in the late 18th century, things were no different.” (WRC, 2025)

The Fédération Internationale de l’Automobile (FIA), governing body of world car motorsport, defines it as “any competition or related sport activity restricted to vehicles that (i) have at least four non-aligned wheels and (ii) are constantly and entirely controlled by a driver on board the vehicle”. (FIA, 2021)

In this chapter, we will cover the history of motorsport from its very beginning, with a particular focus on the innovations that brought this amazing world to where it is today.

2.1 Origins: from reliability trials to Grand Prix

The first official competition was the Paris-Rouen trial of 1894, a reliability test that aimed to prove that motor cars could cover long distances. The following year the first long-distance race took place: the Paris-Bordeaux-Paris. (Britannica, s.d.) In 1904, the sport gained a more formal structure with the creation of the first official international authority called the *Association Internationale des Automobile Clubs Reconnus* (AIACR), that later became the FIA. (Automobile Club de France, s.d.) In just two years, the sport switched from open road to circuit races with the first “Grand Prix”, organized by the *Automobile Club de France* near Le Mans, starting a new trend followed until nowadays. (Britannica, s.d.) In 1907, the first purpose-built racing circuit was created in England: Brooklands, which had a permanent layout and steep banking. (Brookland Watch, s.d.)

2.2 Foundations and Diversification: Indi, Le Mans, Rallies & pre-war Grand Prix era

Soon after Europe, the United States followed up by developing a permanent racetrack inspired by the British one: The Indianapolis Motor Speedway, where the first Indianapolis 500 took place in 1911, signing the beginning of endurance races in the US. (RacingCircuit.info, s.d.) After the success of endurance racing in the States, Europe

answered with the Rudge-Whitworth 24-hour Endurance Grand Prix of 1923 that, like the Indianapolis 500, is still run nowadays but with a different name: The 24 Hours of Le Mans. (24h-LeMans.com, 2023)

In the same period of the introduction of endurance races in America, rally was also taking shape in Europe. In 1911, began The Monte Carlo Rally began, a multi-start road challenge covering the streets of Monaco, (Automobile Club de Monaco, 2015), while Italy followed in 1927 with the creation of the Mille Miglia: an open-road endurance race that covered an “8” shape track from Brescia to Rome and back to Brescia. Both events then had to stop for wars, but then returned in different forms, like the Mille Miglia, that now is a historic regularity event. (1000miglia.it, s.d.)

The following years of pre-war Grand Prix racing were almost always dominated by the legendary “Silver Arrows”: silver-livered racing cars endowed with powerful engines and cutting-edge components. Backed up by the power of the National Socialists, who committed to developing racing in order to use it as propaganda of German excellence, Mercedes-Benz and Auto Union could introduce break-through innovations like the supercharger that made their cars almost unbeatable. (PeterH, s.d.)

2.3 Post-war Reorganization: NASCAR, World Championships and Sponsors

After WWII, motorsport went back to its ordinary course and international governance resumed. In 1948 NASCAR was founded, running its first race in Daytona Beach. (NASCAR, s.d.) In 1950 the first edition of the Formula One World Championship took place, in which cars proudly exhibited their national racing colors. (Bush, 2024) Launched by the FIA, it was initially a championship where only drivers were awarded, but in 1958 also constructors' title followed. (Formula1, Everything you need to know about F1 – Drivers, teams, cars, circuits and more, 2025) This event formalized Grand Prix racing into a consistent global series. 18 years after its creation, F1 witnessed the introduction of the first sponsor: Team Gunston replaced their national colors, replacing it with Gunston Cigarettes'. Colin Chapman didn't hesitate to do the same in the next round with his team, Lotus, that became the first to secure a significant sponsorship with a tobacco company, with its Red, Gold and White colors. This incredible revolution gave

teams, that were before constrained by limited funds, the possibility to experiment, refine and innovate their cars thanks to the great financial support of the sponsors. (Bush, 2024)

The 50s and 60s saw also the endurance sports-car and touring-car racing flourish with competitions such as Le Mans, Sebring and Nürburgring gaining more and more prestige. (LeMans History, s.d.) (Nürburgring, s.d.) (Sebring Raceway, s.d.) International Rally was also expanding and preparing for the creation of a dedicated world series in the 1970s. In all those disciplines technology had a huge boost, with the introduction of engineering innovations like the monocoque chassis, disk brakes and aerodynamics (by Colin Chapman in F1) (Zhang, 2023) but safety was left behind.

2.4 Professionalization, TV Era, World Rallying and Safety Reckoning of late 20th Century

International Rally finally obtained its dedicated series in 1973, when the FIA created the World Rally Championship (WRC) merging classic events like Monte-Carlo into a manufacturer world series where big car production companies could compete against each other in thirteen international events. In 1982 a new era began for Rally with the introduction of four-wheel-drive (despite being allowed since 1979 but considered too complicated by the teams at the time) and the consequent creation of Group B. The increasing power and performance of the cars generated numerous tragedies involving both the drivers and the spectators that forced the FIA to take action: Group B was banned, and Group A was introduced in 1987. Cars had now to be based on their production counterparts, with limitations on power, weight and aerodynamics that lowered the costs to manufacturers and attracted more private teams to join the championship. (WRC, 2025)

During the same years also F1 witnessed incredible innovation and performance increases, but also several serious crashes during the events, like Niki Lauda's famous accident at the 1976 Nürburgring Grand Prix (Donaldson, Niki Lauda, 2025). Those crashes caused the tragic death of 9 drivers between the 1970 and the 1981 (Williamson, s.d.), when McLaren finally introduced the first chassis monocoque entirely made of carbon fiber with the MP4/1, which stiffness and lightweight improved both

performance and safety. (McLaren, 2025) It took, however, the death of two more racing drivers, Roland Ratzenberger and Ayrton Senna at the 1994 San Marino Grand Prix, to reintroduce the Grand Prix Drivers Association, (a union for F1 racing drivers previously dismantled in 1982) which resulted in a drastic reduction of fatal crashes. (Schot, s.d.) In 1981, also the Concorde Agreement was stipulated: a contract between F1, FIA and the competing teams which defined how F1 is run and that gave the Formula One Constructors' Association (FOCA) the right to negotiate TV contracts. That marked a turning point in motorsport management that lasted until 1987, when Bernie Ecclestone founded the Formula One Promotions and Administration, which managed teams TV rights. From then, several more Concorde Agreement have been signed, with the next one due to come into effect in 2026, followed by regulation changes that will reshape power units. (Hardy, 2025)

2.5 New Millennium: Hybrid Tech, New Championships and Digital Fans

In the beginning of the 21st century, FIA started to merge its aim to improve performance with sustainability and efficiency. In 2006 FIA introduced the first real regulations to reduce costs and smooth out the performance for every team, while also aiming to reduce top speed in the straight line, imposing the ban on V10 engines from F1 and limiting the engine size to 2400cc and the number of cylinders to 8, arranged in a 90 degree “V” configuration. (FIA, 2006 FORMULA ONE TECHNICAL REGULATIONS, 2005) The next big change to F1 regulation came in 2014: here the FIA revolutionized the engine conception imposing the use of an electric power unit MGUK of 120kW and a system of energy-recovering during braking called KERS. It also limited the engine cubic capacity to 1600cc, the number of cylinders to six with the same configuration of the previous year and forced the use of a single stage compressor linked to a sole single stage exhaust turbine, officially launching the turbo-hybrid era that we still enjoy today. (FIA, 2014 FORMULA ONE TECHNICAL REGULATIONS, 2011) In 2017, Liberty Media acquired F1 for a total enterprise value of \$8.0 billion, (Formula1, 2017) bringing innovations to the championship management like creating a dedicated live Grand Prix Subscription Service, F1 TV, that helped to expand F1 audience and reshape sport's commercial footprint. (Formula1, Formula 1 to launch F1 TV, a live Grand Prix subscription service, 2018) Alongside the latest introductions of 2014 in F1, the FIA also launched a brand new championship to strengthen even more

its image and aims to sustainability: Formula E, an international all-electric street racing series that covers the most iconic cities in the world, thanks to the green nature of the car that do not pollute that shows what sustainable mobility is capable of. The championship gained a lot of popularity since then, becoming the fastest growing motorsport series on the planet and featuring an enviable greed with drivers the likes of the Formula 1 legend Felipe Massa. (FormulaE, s.d.) The world of endurance racing changed form as well when, in 2012, the FIA created the WEC, a championship where manufacturers raced across multiple continents in 3 main categories: LMP1, LMP2 and LMGTE. This strategic move signed the comeback of endurance racing, bringing back popularity to a branch of racing that was losing its prestige. (Sparco, s.d.) During this period rally evolved too: World Rally Cars took the place of Group A cars and the rallies became shorter, but the calendar was broadened to 14 of them. The 2017 season introduced technical regulations resulting in the new generation of rally cars with increased levels of engine power. This could seem like a contradiction to the philosophy of limitation that shaped the old Group A, but this new boost of power was paired with new aerodynamics and electronically controlled differentials that made the new generation of World Rally Cars much safer than the old Group B cars. (WRC, 2025)

2.6 Cost Control, Convergence, Inclusivity and Sustainability of 2020s

The 2020s began with an important development in the sustainability and financial side of F1: The introduction of the cost cap, a limitation in teams' budget to compete in the World Championship. The main objective of this new rule was to smooth out the disparity between teams' economic power, with the hope of equalizing the performance of all the teams, and to reduce the overall cost of F1 that kept rising every year. (Barretto, 2019) Despite its airtight efficiency in lowering costs, time revealed it wasn't very effective on the performance side, since the top teams continue to win to this day, leaving no space for the others. (Formula1, 2023 RACE RESULTS, s.d.) Diversity initiatives also recently began to take shape with the introduction of a new series exclusively dedicated to woman, with the objective of preparing them to progress to the higher categories like W Series, Formula 3, Formula 2 and Formula 1. (Formula1, Formula 1 announces F1 Academy, a new all-female driver series for 2023, 2022) The endurance racing world also leaped forward after the introduction of the Hypercar category in 2021, taking the place of the LMP1, and the LMGT3 category in 2024, substituting the old

LMGTE. Those new updates attracted a roster of brands, since the cars in both the categories are based on high-performance production models, and aligned with IMSA's LMDh rules to control costs and widen participation, while sustainable fuels and hybridization continue to scale. It also made improvements for inclusivity, introducing two all-female line-ups to the 2021 grid. (Sparco, s.d.) (FIAWEC, 2021) The Dakar rally changed its route to Saudi Arabia from the 42nd edition of 2020, showing motorsport's adaptability to geopolitics and logistics. (Dakar, s.d.) WRC has, instead, been part of a controversial phenomenon. While every other championship is pushing more each year towards an electric future, WRC decided to withdraw its Hybrid Rally1 regulations introduced in 2022, returning to combustion engines. From this year, the Rally1 top category cars will be powered exclusively by a turbocharged 1.6-liter, utilizing 100% sustainable fuel. (WRC, 2025) Popularity of motorsport keeps rising every day on the media side, with data-rich broadcasts, direct-to-consumer streaming, and docuseries that have enlarged the cultural footprint of the sport, attracting new fans and creating new markets.

Across twelve decades, motorsport's history is the story of innovation under constraint: speed versus safety; operational engineering versus cost control; manufacturer marketing versus sporting integrity. The old road trials of the past evolved into regulated championships with strict rules and increasing importance in economics and management, while fan engagement switched from race-weekend sole grandstands attendance to globalized, thanks to the global streams available. However, despite the constant and rapid evolution of the sport, I'm sure that the same three factors will keep defining it in the upcoming years: Technology, Governance and Entertainment.

Chapter 3: Case Studies

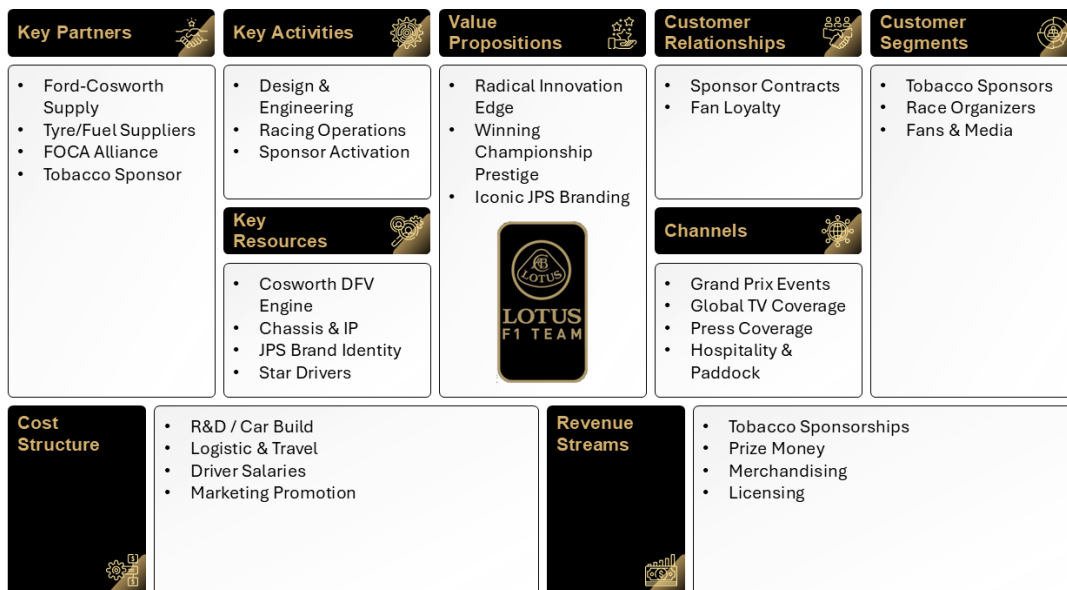
In this chapter, we are going to compile several Business Model Canvas: one from an F1 team of the past, while the others are from teams of the present, competing in different categories of motorsport. This will allow us to visualize properly how the Business Models and the Sustainability Efforts have changed over time, setting ground for our analysis in the next chapter.

3.1 Business Models from the Past

3.1.1 Lotus 72D

With a legacy spanning from 1958 until 1994, Colin Chapman's Team Lotus clinched seven constructors' titles and six drivers' championships. (FormulaOneHistory, s.d.) We will take into account the Team's Business Model for the year 1972, when Lotus won its 4th constructors' title and its third drivers' championship with Emerson Fittipaldi, who, at the age of 25, became the youngest F1 champion of all time on board the upgraded legendary Lotus 72D, with its iconic black and gold John Player Special Livery. (Donaldson, Hall of Fame - Emerson Fittipaldi, s.d.)

Figure 1: Lotus' Business Model Canvas



3.1.1.1 Building Blocks

Customer Segments

We can consider Lotus' Customer Segments as a Multi-Sided Market, since it created value for three distinct sides that were interdependent:

1. Sponsors: Classified as Niche Markets, since they are few, highly specialized, and need high visibility. (Classic Team Lotus, s.d.)
2. Race Organizers: Can be considered a Segmented Market, made of a smaller group with specific needs, like filling the grid or having contractual participation, very different from sponsors and fans. (Diepraam, 2007)
3. Fans & Media: They are a Mass Market. They are a large, broad audience with one undifferentiated need (spectacle). (Cristopher Ward, s.d.)

Value Proposition

Lotus aimed to create value by differentiating through Performance, Newness, and Brand/Status:

1. Radical Innovation Edge: Lotus brought many innovations with its upgraded 72D, some of which were revolutionary, endowing it with an incredible pace on track. (Newness and Performance) (Melissen, s.d.)
2. Winning Championship Prestige: Those innovations granted Lotus' constructors' title and Fittipaldi's drivers' championship of 1972. (Performance) (Melissen, s.d.)
3. Iconic JPS Branding: With the introduction of the new livery, it delivered a symbolic brand value. (Brand/Status) (Cristopher Ward, s.d.)

Channels

Lotus communicated with its Customer Segments to deliver its Value Proposition through a combination of Partner and Own Channels, typical of motorsport teams:

1. Grand Prix Events: Controlled by promoters, they were the primary Partner Channel for sponsor visibility and sporting value. (Classic Team Lotus, s.d.)

2. Global TV and Press Coverage: Sponsors sought media exposure inside and outside the track through TV and Press, which are controlled by third parties. (Rong, 2018)
3. Hospitality & Paddock: They were owned Channels under Lotus' control, which were exploited to further deliver sponsors' and team's Value Proposition. (Classic Team Lotus, s.d.)

Customer Relationships

Lotus established two types of relationships with its customers:

1. Sponsors Contracts: They had one-to-one Dedicated Personal Assistance through branding rights tied to contractual obligations. (Classic Team Lotus, s.d.)
2. Fan Loyalty: Fans, emotionally tied to the brand, resembled Communities around Lotus and JPS. (Cristopher Ward, s.d.)

Revenue Stream

Lotus was able to generate several Revenue Streams:

1. Tobacco Sponsorship: It was the core financial stream in the 70s and represented a Recurring Revenue based on multi-year contractual sponsor agreements. (Classic Team Lotus, s.d.)
2. Price Money: Prices were tied to racing performance; therefore, they can be considered Transactional Revenues. (Diepraam, 2007)
3. Merchandising and Licensing: Like the previous one, Merchandising and Licensing were Transactional Revenues, linked to the number of items sold. (Rong, 2018)

Key Resources

The most important assets required to make Lotus' Business Model work were:

1. Cosworth DFV: It was the powerful and dominant engine of the car, an essential Physical Resource. (Melissen, s.d.)

2. Chassis & IP: The chassis was another crucial Physical Resource, while Chapman's innovations were core IP for the competitiveness of the brand as well as Intellectual Key Resources. (Melissen, s.d.)
3. JPS Brand Identity: Another important Intellectual Resource, since it was the visual asset that the sponsors leveraged. (Cristopher Ward, s.d.)
4. Star Drivers: Talents like Emerson Fittipaldi were key Human Resources for the brand's success. (Melissen, s.d.)

Key Activities

It is possible to identify 3 Key Activities indispensable for the company's Business Model to work:

1. Design & Engineering: Core activities to create winning cars; they fall into the Production category of Key Activities. (Melissen, s.d.)
2. Racing Operations: Main activities of every motorsport team, fall both into Problem Solving and Platform/Network since the team must constantly solve problems to stay competitive, and operates in the multi-sided ecosystem of the Customer Segments. (Melissen, s.d.)
3. Sponsor Activation: It falls into the Platform/Network category, since Lotus was the bridge connecting sponsors and fans. (Classic Team Lotus, s.d.)

Key Partnerships

Lotus had four main Partners:

1. Ford-Cosworth Supplier: A Strategic alliance between non-competitors to save costs and increase efficiency, falling into the Optimization of Economies of Scale motivation. (Melissen, s.d.)
2. Tyre/Fuel Suppliers: Both were buyer-supplier relationships to assure reliable supplies, but with a second-level distinction. The tire suppliers standardized supply with economies of scale in production and logistics, lowering cost per unit and optimizing resource usage across the different teams. The fuel suppliers specialized in fuels and lubricants Lotus couldn't produce itself. (Melissen, s.d.)

3. FOCA Alliance: It was a cooperation between competitors to increase collective bargaining and reduce financial risk from unpredictable organizers' fees. (Reduction of risk of Uncertainty) (Diepraam, 2007)
4. Tobacco Sponsor: Another strategic alliance between non-competitors that reduced uncertainty in revenue flows, granting a long-term sponsorship with JPS and granted access to a particular resource that Lotus didn't have, marketing and global advertising budgets. (Melissen, s.d.)

Cost Structure

The overall Cost Structure can be considered value-driven, since winning was more important than minimizing costs. The main costs that Lotus had to face to operate were:

1. R&D/Car Build: Since Lotus was pushing innovation without minimizing cost, both R&D and Car build could be considered Value-Driven cost structures, except for the choice of Ford-Cosworth engine, which was a Cost-Driven cost structure since it was cheaper. (Melissen, s.d.)
2. Logistics & Travel: Racing worldwide had high logistic costs that belong to the Fixed Costs class. (Classic Team Lotus, s.d.)
3. Driver Salaries: Paying drivers like Fittipaldi had a high Variable Cost. (Melissen, s.d.)
4. Marketing Promotion: Hospitality, sponsor promotion, and marketing were all characterized by a mix of high Fixed and Variable Costs. (Classic Team Lotus, s.d.)

3.1.1.2 Sustainability

The concept of sustainability wasn't widely diffused as it is today in the 70s; the main concern that was starting to take shape was safety.

3.2 Present Business Models

3.2.1 Toyota Racing Division – Toyota Gazoo Racing

Toyota Motorsport's history dates back more than 60 years. During this period, it raced in all categories of motorsport, winning a total of 18 constructors' titles between WRC, WEC, and W2RC, 14 of which under the new name of Toyota Racing Division: Toyota Gazoo Racing. Officially created in 2015 by Akio Toyoda, grandson of the founder Kiichirō Toyoda and president since 2009, team Gazoo Racing almost instantly conquered the world scene of motorsport. After only 3 years since the rebranding, it won both the FIA World Endurance Championship, annihilating the rivals, winning 7 races out of 8, and the FIA World Rally Championship, with podium results in 9 of the 13 races. Since then, Toyota Gazoo Racing won 12 Manufacturers' titles:

- 5 FIA World Endurance Championships,
- 4 FIA World Rally Championships,
- 3 FIA World Rally-Raid Championships,

And I am sure it will keep winning in the years to come. (Toyota Gazoo Racing, OUR STORY - Pushing Limits for the Better, 2025) (Motorsport Stats, Toyota Gazoo Racing Statistics and Results, 2025) (Rallypedia.com, s.d.) (World Rally-Raid Championship, 2025) (eWRC-Results.com, s.d.) (Motorsport Stats, FIA World Endurance Championship Results 2018, s.d.) (Toyota, 2015)

“しかし、GAZOO Racingの原点ある「もっといいクルマを作ろう」という活動にはゴールはなく、これからもまだまだ続いていく。”

“However, the original activity of GAZOO Racing, which is ‘to build ever-better cars’, has no final goal and will continue well into the future.” (Toyota Gazoo Racing, GAZOO Racing 3クラス制覇!, 2014)

Figure 4: Toyota Gazoo Racing Business Model Canvas



3.2.1.1 Building Blocks

Customer Segments

Toyota Gazoo Racing Team serves several customer segments:

1. **Global Motorsport Fans:** Broad fanbase that follows the championship where the team competes, like WEC, WRC, W2RC, and Super Taikyu, in which Gazoo Racing competes, also with a hydrogen concept GR Corolla in the ST-Q category. It is a Mass Market.
2. **Sponsors & Partners:** They are companies that fund TGR through sponsorship, licensing, and cobranding. They provide equity and visibility, critical factors to sustain motorsport. It can be considered a multi-sided platform.
3. **Toyota's Global Customer Base:** Regular car buyers who are indirectly reached by motorsport branding and innovations that will end up in road cars, boosting Toyota's image. They are a mass market.

Value Proposition

TGR creates value through:

1. Sustainability Leadership in Motorsport: Toyota's carbon-neutral fuels and ESG integration allow the delivery of getting the job done and brand & status values
2. Technology Transfer to Road Cars: Research & Development applied to GR sport cars. It contributes by delivering performance values.
3. Motorsport Dominance: Toyota's world titles, particularly the 14 most recent ones, across different branches of motorsport, give strong signals of performance value.
4. Fans Experience and Emotional Connections: It creates race excitement through events and merchandise, transmitting brand & status, and accessibility values.

Channels

The team communicates with customers through:

1. Live Competitions and Endurance Events: It uses race participation in events like Super Taikyu, WRC, and WEC as its communication channel. It is an indirect partner media that serves awareness, evaluation, and delivery phases.
2. Official TGR Website and Social Media Platforms: It provides news, schedules, race results, and exclusive technical insights, giving Toyota its own direct communication channel with its official accounts, and partner indirect channels with social media platforms. They cover awareness, evaluation, and after-sales phases.
3. On-Site Events and Hospitality: They include VIP packages, paddock access, and fan zones during the main events where TGR competes, deepening emotional bonds. Those are their own direct channels that cover evaluation, delivery, and after-sales phases

Customer Relationships:

Toyota establishes the following relationships:

1. Fan Engagement: With digital and on-site fan engagement, Toyota builds long-term loyalty via media, events, and experiences that aim to acquire new customers and

retain the ones already existing, with initiatives in the categories of communities and co-creation, since they feel more engaged by sharing content and participating in pools.

2. Sponsor Relations: TGR manages sponsorship agreements closely with them with dedicated support and co-branded marketing campaigns. This generates customer acquisition and retention with dedicated personal assistance and co-creation relationships.
3. Customer Care for GR Car Buyers: It includes special services for GR car owners to retain them, like clubs and events. This is part of personal assistance and communities.

Revenue Stream

Toyota generates revenue through:

1. Sponsorship & Brand Partnerships: TGR's largest income source, they are agreements with global corporations that exchange money for visibility, hospitality rights, and co-marketing. They are advertising fees that generate recurring revenues.
2. Licensing and Merchandise: Generated by the sale of branded accessories, collectibles, and apparel. These licensing deals allow third parties to produce TGR-branded products. They are both transactions and recurring revenues that belong to asset sales and licensing categories.
3. Hospitality & Fan Experiences: They are formed by VIP paddock passes, premium hospitality, and corporate entertainment packages sold at events. They are transaction revenues of the usage fee and asset sale categories
4. Technology Transfer and R&D Commercialization: The knowledge and technology that is then applied to road cars improve sales across the lineup. Sometimes, Toyota also engages in collaborative R&D or joint projects, generating recurring revenue from the licensing category.

Key Resources

The team's main assets are:

1. **Motorsport Teams and Human Capital:** They include drivers, engineers, management staff and strategists, all human key resources. Their experience grants TGR to compete globally with top innovation and performance.
2. **Racing Cars & Hybrid Powertrains:** They are indispensable for the competitions as well as proving ground for future road car innovations. They fall into the category of physical resources.
3. **Research and Development:** They comprehend the team's motorsport engineering hubs that develop new technologies rapidly. They are both intellectual and physical resources.
4. **Toyota & Gazoo Racing Brand Identity:** Gazoo Racing gives Toyota credibility in motorsport and performance cars; on the other hand, Toyota provides global trust and recognition. They are intellectual resources for one another.
5. **Financial Support from Toyota Motor Corporation:** It provides equity to fund motorsport programs, ensuring long-term stability. It is a financial resource.

Key Activities

TGR central activities include:

1. **Competing in FIA Championships:** The team's primary activity is designing, building and racing cars in championships like WEC and WRC. Winning generates visibility and strengthens Toyota's brand. It is considered a production activity.
2. **Motorsport R&D and Innovation:** Motorsport serves as laboratory for innovations that will be applied to road cars in future. This falls into the problem-solving category.
3. **Sponsorship and Partnership Management:** Maintaining these relationships grant the team long-term financial and strategic stability and it is a platform/networking activity.

4. Brand Marketing and Engagement: TGR markets its brand using campaigns, social media, merchandise, and experiences, transforming motorsport in a machine for loyalty and sales. This is a platform/networking activity.

Key Partnerships

The main network of suppliers and partners of the team is made up of:

1. Suppliers: Among them, we find high quality suppliers for tires, lubricants, and other racing parts that grant the team its reliability. They are buyer-supplier relationships to acquire resources and ensure a reliable supply.
2. Technology and R&D Partners: Toyota cooperates with tech companies, universities, and hydrogen innovators to boost its hybrid systems, revolutionary hydrogen engines, and material development. They are alliances between non-competitors with the scope of acquiring resources and activities.
3. FIA and Motorsport Governing Bodies: The collaboration between Toyota and these governing bodies, like the FIA, grants the brand's compliance to the regulations and its persisting championship presence. They are strategic alliances to reduce the risk of uncertainty for the team, which exploits the organizer's global platform instead of building its own.
4. Event Organizers and Promoters: Toyota also cooperates with championship organizers to secure visibility and smooth race operations, creating strategic alliances with non-competitors and optimizing the allocation of resources.
5. Corporate Sponsors & Brand Partners: Sponsors fund TGR to get visibility in exchange for joint marketing and share hospitality activities. These strategic alliances between non-competitors aim to optimize & economies of scale and acquisition of resources.

Cost Structure

TGR sustains the following costs to operate its business model:

1. **R&D and Engineering Costs:** One of its largest cost drivers is investments in powertrains, hydrogen engines, aerodynamics, and material research. They are fixed, value-driven costs.
2. **Team Operations & Personnel Expenses:** They include salaries for drivers, engineers, and mechanics, which are fixed costs, and all the travel and accommodation expenses, which are variable costs.
3. **Vehicle Development & Manufacturing Costs:** They are made of continuous building, updating, and homologation of the racing cars, including materials, components, and crash testing. All these elements are value-driven variable expenses, since they change every year.
4. **Marketing and Sponsorship Activation Costs:** They include media campaigns, merchandise production, sponsor activations, and digital platforms to engage fans. All of them are variable costs.
5. **Championship Entry Fees & Regulation Compliance:** Participating in official FIA championships requires paying entry and homologation fees, and other fixed costs of adapting vehicles to every year's new regulations.
6. **Sustainability & Innovation Investments:** This category contains costs linked to hydrogen technology development, carbon neutrality programs, and implementation of ESG initiatives aligned with Toyota's corporate strategy.

3.2.1.2 Sustainability

Toyota has announced that, in response to climate change, it will address global challenges with the goal of achieving carbon neutrality by 2050. The central concept of Toyota's multi-pathway strategy is to provide a wide variety of mobility options while advancing the decarbonization of manufacturing and supply chains. In October 2023, Toyota revealed a partnership with Idemitsu to pursue the mass production of all-solid-state batteries for BEVs, aiming for commercialization between 2027 and 2028. The company is also promoting external sales of fuel cells based on Mirai's hydrogen units and has received a request to supply 100'000 fuel cell units annually by 2030. In 2024, Toyota's initiative to race a Corolla powered by a hydrogen engine entered its fourth

year, with the liquid hydrogen-fueled car successfully completing the race. Toyota will continue to increase the potential of hydrogen engines in line with the principle of “ever-better car making from a starting point in motorsport” and its multi-pathway approach. (Toyota Motor Corporation, Toyota Integrated Report 2024, 2025) (Toyota Motor Corporation, Sustainability Data Book2024, 2025)

3.2.2 Ferrari Racing Division – Scuderia Ferrari & Ferrari AF Corse

Founded in 1929 by Enzo Ferrari, Alfredo and Augusto Caniato, Mario Tadini, and Ferruccio Testi, the Modenese Scuderia Ferrari is the most successful motorsport team, boasting 15 Drivers’ titles and 16 Constructors’ titles wins with their ever-red car. Over its ninety years, it has seen legendary drivers like Michael Schumacher, Niki Lauda, and Alberto Ascari, with whom it has faced both incredible victories and defeats that have contributed to its competitive development. (Ferrari, 16 Novembre 1929: Nasce la Ferrari, s.d.) (Ferrari, 90 Anni di Scuderia Ferrari: La Storia Completa, s.d.) (Sky Sport, 2024)

Figure 2: Ferrari Racing Division’s Business Model Canvas



3.2.2.1 Building Blocks

Customer Segments

The different groups of people or organizations the team aims to reach are:

1. Global F1 Audience: They are the spectators watching F1 from home, forming Scuderia Ferrari’s largest exposure base, reaching a cumulative amount of 1.3 billion

people. They can be classified as a Mass Market, since they represent a very broad, undifferentiated audience.

2. VIP Hospitality Clients/Event Guests: High-net-worth individuals and partners invited to exclusive Ferrari Formula 1 Club and Casa Ferrari experience in the world of WEC, engaging directly with Ferrari through events. This exclusive and premium group can be classified as a Niche Market.
3. Historic Car Collectors: Collectors and clients purchasing historic F1 cars, recycling ex-F1 assets. Considering the extremely limited demand, this group can also be considered a Niche Market.

Value Proposition

Scuderia Ferrari generates value through different characteristics:

1. Racing Heritage: Ferrari's unique prestige in being the only team to be present in every F1 season since its beginning, a core difference in comparison to its rivals. It creates customer value with Brand/Status and Performance Value Propositions, since its heritage reinforces the team's credibility and prestige.
2. Tech Transfer: It represents the F1-derived technologies that are later applied to road cars. Examples of this are paddles, composites, aerodynamics, and hybrid engines. This means that racing creates new features for road cars, contributing to generating customer value with Performance and Newness Value Propositions.
3. Hybrid Propulsion Innovation: The new hybrid units that are nowadays widely used in motorsport drive the team's edge, being aligned with environmental and efficiency goals. It delivers both a Performance and a Sustainability Value Proposition.
4. Brand Promotion: Ferrari uses racing itself as a marketing tool, reaching a global F1, WEC and GT audience and delivering a Brand/Status Value Proposition.
5. Exclusivity: Ferrari avoids mass media, reinforcing its idea of exclusivity through motorsport and delivering once again a Brand/Status Value Proposition.

Channels

The team communicates and reaches its Customer Segments through 4 main channels:

1. **Global F1 Broadcasting:** TV and streaming broadcasts of F1 races that bring Ferrari into homes worldwide. This can be considered a Partner Indirect Channel, since races are broadcast by F1, serving the Awareness and Evaluation phases, in which spectators observe on-track performance.
2. **Sponsor Logos:** They represent the sponsor branding that is visible on both race cars and uniforms. We can consider them Partner Indirect channels that serve primarily the Awareness Phase and then the Evaluation Phase.
3. **Driver Promotions:** They describe Scuderia Ferrari's drivers appearing in vehicle or brand promotions. They are Owned Direct Channels that serve the Awareness, Evaluation, and Purchase phases, since the credibility of the drivers stimulates sales for track experiences and other brand offers.
4. **Esport Racing:** It indicates Ferrari's own Esport teams and series that engage global digital audiences. Can be defined both as Owned Direct, for the team and the content, and Partner Indirect, for the distribution on platforms governed by third parties. It serves the phases of Awareness, Evaluation and After-Sales, since its ongoing community.

Customer Relationships

Scuderia Ferrari establishes 4 types of relationships with its Customer Segments:

1. **F1 Club Hospitality:** It represents high-level experiences for VIPs during race weekends. This tailored and personalized service can be identified as a Dedicated Personal Assistance.
2. **Final Mondiali:** It is a large-scale event that merges racing and lifestyle in a weekend of racing activities. Since it builds shared identity, it is grouped into Communities.
3. **Lifestyle Events:** They are exclusive gatherings that combine motorsport with the luxury of Ferrari's lifestyle, strengthening the brand's experimental dimension. It is classified as a mix of Co-Creation and Community, since clients are active participants.

4. **Collector Engagement:** It describes the one-to-one relationship that Ferrari has with its collectors through racecar sales. This Direct and individualized relationship makes it a Dedicated Personal Assistance.

Revenue Streams

Scuderia Ferrari generates income in 5 main ways:

1. **Sponsorship Income:** Commercial payments from brand partners are the key inflow from sponsor agreements. We classify them as Recurrent Advertising fees.
2. **F1 Prize Share:** It is the revenue from Ferrari's share of F1's commercial rights; we consider it a Recurrent Usage Fee.
3. **Engine Rentals:** Ferrari rents its power units to teams like Haas and Stake KICK Sauber, generating a Recurring Revenue from engine rental contracts that can be described as Lending/Renting since the temporary use of those engines.
4. **Historic F1 Car Sales:** These come from selling old Ferrari F1 cars to collectors, an Asset Sale that represents a transaction revenue coming from one-time customer payments.

Key Resources

The most important assets required to make Scuderia Ferrari work are:

1. **Maranello HQ:** Ferrari's central facility to develop F1 design and production, the main Physical resource of the team.
2. **F1 Facility:** Area of the HQ completely dedicated to F1 production and for team development, it represents another crucial Physical resource
3. **Wind Tunnel:** Infrastructure where the aerodynamics of the cars are tested, it is a central Physical resource for Ferrari's R&D.
4. **Fiorano Circuit:** Used for car development, it is another Physical resource that provides a testing venue and event hosting.
5. **Scuderia Ferrari Brand:** It is the heritage and reputation of the team in F1 It is an intangible Intellectual resource, central to Ferrari's business model.

Key Activities

The main activities of the team are:

1. Annual Car Design: Seasonal Development of the new F1 car, which is classified as a Production activity.
2. Racing R&D: It is the continuous innovation to maximize efficiency, categorized as a Problem-Solving activity, since it solves complex engineering challenges.
3. F1/WEC/GT3: They represent the activity around which the whole Scuderia Ferrari world revolves: racing. They fall into the Production category since it is the core execution of the value proposition.
4. Esport Racing: It represents Scuderia Ferrari's sim racing competitions, expanding it into the digital motorsport environment, connecting new generations. It is classified as Production, since it is still racing, but also Platform/Networking, because of the digital engagement and community building.

Key Partnerships

The network of suppliers and partners needed to make Ferrari's business model work is composed of:

1. Concorde Agreement: The institutional contract between every team and F1/FIA guarantees Ferrari's historic status and share of revenues. It is considered a Strategic Alliance between non-competitors that aims to reduce risk and uncertainty, since it provides stability and reduces financial and regulatory uncertainty.
2. AF Corse: Ferrari's operational partner to manage the GT and Endurance racing branch, providing expertise and operational support. It is classified as a Cooperation for the acquisition of resources and activities, like the know-how and capacity.
3. Sponsors: Commercial partners funding Ferrari in exchange for brand exposure, they are considered as strategic alliances between non competitors to acquire resources. Ferrari gets funding, tech support and other resources, while the sponsor gets the visibility and association with prestige to a worldwide crowd.

4. **Visibility Deals:** They are partnerships involving logo placement and exposure, crucial for sponsor activation. They are strategic alliances between non-competitors for resource acquisition.

Cost Structure

The costs incurred to operate Ferrari's business model are:

1. **Heavy R&D Costs:** Necessary to support intensive research for Ferrari's F1 and other racing cars. They are considered Cost Driven Variable Costs, since Ferrari tries to innovate as much as possible, while minimizing costs.
2. **FIA Budget CAP:** Fixed ceilings set by the FIA of F1 spending, divided into €148m for the chassis and €98.5m for the power units. It is a fixed cost.
3. **Regulatory Costs:** Costs due to rule changes that require technical adjustments. They are Cost-Driven Variable Costs, since they are flexible, but also dependent on regulation.

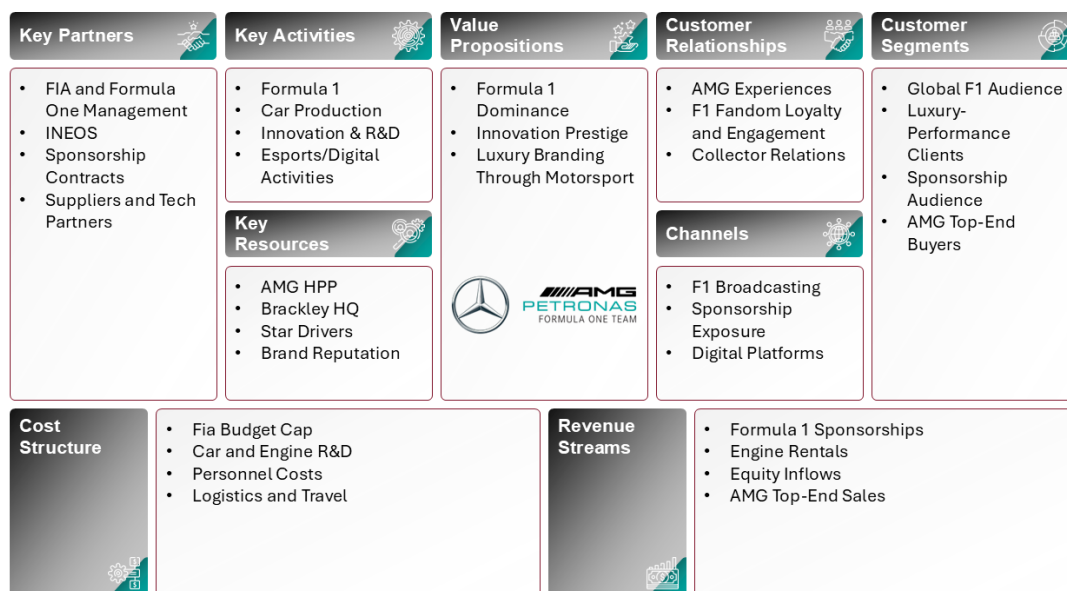
3.2.2.2 Sustainability

Sustainability is considered a core element in Ferrari's governance model, stating that their management plays a direct and active role in developing and achieving sustainability objectives. For example, in 2024 Ferrari replaced a significant portion of gas consumption in their production process with renewable energy sources, causing a reduction of 60% in CO2 emissions and 70% in methane gas consumption compared to 2021. In 2023 they introduced, together with logistic partners, Hydrotreated Vegetable Oli (HVO) fuel in most of their Europe outbound logistic on road, allowing a GHG emission reduction of 80%. Lastly, in 2024, Ferrari has received once again the three stars of the FIA Environmental Accreditation Program. (Ferrari N.V., 2025)

3.2.3 Mercedes Racing Division – Mercedes-AMG PETRONAS F1 Team

Mercedes racing history began in unison with the birth of motorsport: the Paris-Rouen of 1894. From that day it kept racing, dominating during the 30s with the iconic Silver Arrows and winning two F1 World Titles with Juan Manuel Fangio in 1954 and 1955. Unfortunately, tragedy struck at the 24 Hours of Le Mans, when the Mercedes driver Pierre Levegh was involved in a crash that killed him and more than 80 spectators. In that moment Mercedes decided to withdraw from motorsport, making its return only as a engine supplier in 1994. It made its true comeback in 2010 acquiring the Brawn GP Team, with Nico Rosberg and the legend Michael Schumacher as its crown jewel. The beginning of the hybrid era marked also the real rise of Mercedes that, after four difficult years, won every Constructors' title from 2014 to 2021, creating the longest streak of all times. During the same years, Lewis Hamilton added to his prior Drivers' title with McLaren six more titles with Mercedes, tying Michael Schumacher's record. The team keeps racing nowadays, always aiming to the top of the standings with the same hunger for victory of the first day. (SilverARROWS.net, s.d.) (Formula 1, s.d.)

Figure 3: Mercedes-AMG PETRONAS F1 Team's Business Model Canvas



3.2.3.1 Building Blocks

Customer Segments

Mercedes aims to reach the following Customer Segments:

1. **Global F1 Audience:** Like Ferrari, it is the main communication channel and a Mass Market
2. **Luxury-Performance Clients:** Those represent corporate clients and high network individuals that access team's hospitality during races. It is a Niche Market, since it is a tailored experience for exclusive clients.
3. **Sponsorship Audience:** Brands partnering with Mercedes, who buy visibility through F1 broadcasting. It is a Multi-Sided Market: the team connects sponsors with global audience.
4. **AMG Top-End Buyers:** Those are buyers of historic F1 cars and relics, important to keep heritage monetized. Also, Niche Market for its exclusive collector base.

Value Proposition

Mercedes generates value through:

1. **Formula 1 Dominance:** The team promises innovation and winning performance in the championship, being validated by its several world titles. This reflects Performance elements for its value proposition.
2. **Innovation Prestige:** It includes the innovations that are brought from the racetrack to the road, like the hybrid power units, showing elements of Performance and Newness that add credibility and leadership image.
3. **Luxury Branding Through Motorsport:** Represents the boost in brand value coming with its association with F1 success. It shows elements of Branding/Status Value Proposition: racing prestige reinforces the luxury images of the mother brand.

Channels

The team communicates with Customer Segments:

1. **F1 Broadcasting:** F1's media coverage across more than 180 territories is an Indirect Partner Channel, since the media rights are controlled by Formula One Management, and covers the Awareness and Evaluation Phases.
2. **Sponsorship Exposure:** Provides sponsor visibility through team assets such as cars and drivers. Also, this Channel is a Partner Indirect one that covers the phases of Awareness and Evaluation.
3. **Digital Platforms:** Fastest growing Channel that changes between Own Direct and Partner Indirect, based on the platform used. Covers the phases of Awareness and Evaluation, but also After Sales with its communities.

Customer Relationships

The types of relationships Mercedes establishes with its Customer Segments are:

1. **AMG Experiences:** They are personalized hospitality and paddock experiences for VIPs focused on exclusivity and immersion. Driven by Customer Acquisition and Retention motivations, they fall into the Personal Assistance category for their high-touch engagement.
2. **F1 Fandom Loyalty and Engagement:** Represent digital and live experiences that connect global fans. They are part of the Community category of Customer Relations, aiming to acquire and retain customers.
3. **Collector Relations:** Ongoing ties with AMG Top-End Buyers to maintain exclusivity and brand loyalty; they aim to retain customers. They fall into the Dedicated Personal Assistance Category.

Revenue Streams

The team generates cash through the following means:

1. **Formula 1 Sponsorships:** Primary sources of revenue, which represent the income from corporate sponsors funding the team. They are recurring revenue generated by Advertising.
2. **Engine Rentals:** Mercedes provides engines for McLaren, Williams, and Aston Martin, making it the most popular on the grid. They are recurring revenues from the Lending/Renting/Leasing category.
3. **Equity Inflows:** They include F1 prize money generated by the share of F1 commercial rights owned by the team. They are recurring revenue classifiable as Usage Fee.
4. **AMG Top-End Sales:** Revenues from selling historic Mercedes F1 cars are a niche source of cash from collectors, representing one-time revenues coming from Asset Sales.

Key Resources

Mercedes' most important assets are:

1. **AMG High Performance Powertrains (HPP):** It is a subsidiary company that develops engines for the team. It is both a Physical and a Technological resource, since it is key to hybrid engine innovations.
2. **Brackley HQ:** Team's base where the cars are designed and built, therefore the main Physical resource.
3. **Star Drivers:** Human Resources and key brand assets, enhancing their reach and visibility through their popularity.
4. **Brand Reputation:** Mercedes' status as innovation leader ties its image to high performance, making it an incredible Intellectual resource.

Key Activities

Its main activities are:

1. Formula 1: Competing in the championship is the most important Production activity for the team.
2. Car Production: Manufacturing the car each year is the core annual task.
3. Innovation & R&D: Consists of developing and improving hybrid engines in Brixword. Can be categorized as a Problem-Solving activity, since it also includes solving environmental challenges and improving engines' efficiency.
4. Esports/Digital Activities: They are Platform/Networking activities that aim to build fan communities.

Key Partnerships

Mercedes' network of suppliers and partners is made up of:

1. FIA and Formula One Management: Institutional partners established through the Concorde Agreement, it is a strategic alliance between non competitors to reduce risk and uncertainty.
2. INEOS: It is a strategic co-branding and equity partnership, which consists in joint ownership to achieve optimization and economy of scale.
3. Sponsorship Contracts & Suppliers and Tech Partners: PETRONAS is the protagonist of those categories, being the title sponsor but also a specialized fuel and tech partner. It is a buyer-supplier relationship to acquire resources.

Cost Structure

The team's main costs are:

1. FIA Budget Cap: Fixed costs imposed by FIA.
2. Car and Engine R&D: It is the variable cost of continuous innovation that Mercedes, like the other teams, tries always to minimize in order not to exceed the budget cap. Therefore, it presents a cost-driven cost structure.

3. Personnel Costs: Include the salaries of the engineers, the drivers and the support staff. All of them are fixed costs, since salaries are fixed.
4. Logistics and Travel: It deals with transportation of cars, equipment and personnel. They are variable costs, since they fluctuate every season.

3.2.3.2 Sustainability

Mercedes-AMG PETRONAS F1 Team is one of the “greenest” teams on the grid, with its standing out Net Zero objective by 2030, together with the commitment to halving single-use plastic by 2026. It reduced CO2 emissions from race team operations by over 50% compared to 2018 levels, using energy coming from renewable sources, adopting an improved logistic planning and investing in sustainable aviation fuel. Its base and its engine facility run on 100% renewable electricity and feature solar panels supplementing power. In 2024 the team introduced a circularity program for race components to limit the amount of waste produced and resources consumed. Lastly it reached high levels of inclusion and diversity, dedicating 38% of newly hired personnel to underrepresented groups. (Mercedes-Benz Group, 2025) (Mercedes-AMG PETRONAS F1 Team, 2025)

Chapter 4 – Conclusions

The main questions of this thesis were: How the Business Model of Motorsport Teams evolved throughout the years? How much more important is Sustainability now compared to the past? What Are the Key Implications for the future? Let's analyze the first question by comparing the building blocks of Lotus' 1972 business model canvas with the more recent ones:

Customer Segments evolved from a large, less segmented audience, made of big crowds, limited TV coverage and sponsor variety, to a global multi segmented audience, made of mass fans, digital communities, huge corporate sponsors and VIP guests

The value proposition grew from narrow bundle of products and services to deliver value to customers, including winning races, exiting fans and showcasing sponsor logos, to a much broader one, that still includes the same values, but then adds the building of communities, the testing of new technologies, the delivery of sustainability principles and the providing of platforms for the storytelling.

Channels switched from having only 2 big channels in the 1970s, TV and live attendance, to a complex system with multiple layers, that combines physical, digital and hybrid experiences; From a one way communication, broadcast and press, to modern interactive co-creation through social media and fan communities; From limited sales channels, meaning tickets and merchandising at the track, to a global e-commers and experiential offerings.

Customer Relationship changed under 3 main aspects: The fans that went from being spectators to being participants and co-creators; Sponsors focus changed from logo visibility to strategic ESG and innovation partners; Customers went from having no direct connection to obtaining exclusive GR, AMG and Ferrari club experiences. Overall, it went from few, linear relationships to a managed ecosystem composed by multiple layers.

Revenue streams evolved from a double pillar structure, sponsors and prize money, to multi-stream portfolio; From heavily relying on transactions, to find a balance between transactions and recurring revenues like multi-year contracts, licensing and subscription

services; From Sponsor visibility only, to the monetization of fans, through merch and experiences, and to the corporate innovation, through tech transfer and sustainable R&D.

Key Resources developed in several aspects:

- Its scale went from fairly small garage operations to huge corporate R&D centers.
- Its technology switched from basic race cars to hyper technologic shuttles with hydrogen technology and hybrid power units.
- Its human capital grew from charming drivers and small teams to omnipresent teams in every category of motorsport.
- The intellectual property evolved from simple reputation to formal brands with licensing and IP portfolios.
- The finance side skyrocketed from depending on a single sponsor to having diversified, institutional backing.

In key activities, production switched from hand built cars in humble workshops, to industrialized, corporate supported production with advanced facilities large millions of square kilometers; Problem-solving evolved from “garage innovation” through mechanical modifies to cutting-edge R&D departments, with global labs, sustainability research, and tech transfer to road cars; Platform/Networking went from almost non-existing to being a central activity, thanks to which teams now are global entertainment brands, sustainability ambassadors, and corporate technology patterns.

Key partnerships evolved in many of their components:

- Sponsors converted from being almost only tobacco and oil companies to having diversified portfolios in tech, finance or ESG.
- Suppliers shifted from core parts, like engines and tires, to integrated R&D collaborations, like fuels, data, AI, and sustainability tech.
- Regulators changed from competition to access a full ecosystem of managers, focused on media rights, ESG standard and cost caps.

- Coopetition went from practically being absent in the 70s to being formalized with FIA commissions, joint safety and sustainability initiatives.
- Ecosystem size grew from a handful of essential partners to dozens of specialized partners per team, forming ecosystems.

Lastly, cost structures changed in:

- Shape, growing from lean garage budgets to multimillion dollars equity.
- Focus, shifting from a union of car and crew to an entirely new ecosystem of R&D, sustainability, fan engagement and brand building.
- Nature, reformed from being mostly transactional racing costs to highly value-driven strategic spending

Furthermore, Cost structures witnessed also the birth of some new categories like sustainability, digital platforms, hospitality and compliance.

Now we can answer to the second question: How much more important is Sustainability now compared to the past? Sustainability had a huge leap forward during the last 50 years. It is enough to consider that all the modern teams that we have analyzed have made their strength out of sustainability, generating a race to the top to see which team is going to be carbon neutral first. Their value propositions reflect perfectly this aspect, through their constant common point in hybrid engines and sustainability, since they are all very focused on R&D for innovation, showing how sustainability represents now a competitive advantage, and not a side project like in the past. If we compare these aspects to the fact that not even safety of drivers was that much of a priority back in the days, it is clear how the world of motorsport in changed since the 70s.

Now it is time for the third and final question: What are the implications for the future?

In the future the teams will need to integrate carbon, neutrality, e-fuels, hydrogen and electrification into their business models, since sustainability won't no longer be an optional, but a license to operate and a lever to attract sponsors.

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