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Exploring the evolution of the automotive ecosystem in Morocco: insights from semi-structured interviews

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Abstract: The automotive industry is undergoing a global transformation, and Morocco is also experiencing significant changes in its automotive ecosystem. This study utilises semi-structured interviews as a scientific method to investigate the opportunities and challenges for innovative management in navigating this transformation in Morocco. Through semi-structured interviews with key stakeholders in the Moroccan automotive industry, this research identifies various factors that influence the transformation of the ecosystem, including government policies, technological advancements, customer preferences, and competition. Furthermore, the study discusses how creative management practices, aligned with the global value chains (GVC) concept, can enable companies in Morocco to seize opportunities and overcome challenges associated with this transformation. The findings of this research have implications for automotive SMEs in Morocco and can provide insights for policymakers and practitioners in other emerging economies. Moreover, a new conceptual framework is proposed to analyse automotive ecosystems.

Keywords: automotive; industry; innovation; ecosystem; SME; Morocco; management practices; global value chains; GVC; semi-structured interviews.

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1 Introduction: the advent of Moroccan automotive ecosystem

Morocco has been implementing various economic and social reforms over the years to accelerate the structural transformation of its productive system and make it more competitive (Jullien and Smith, 2012). However, conventional factors of territorial development are no longer sufficient to ensure sustainable industrial growth. Therefore, there is a current trend towards integrated management systems, such as ecosystems, to achieve a competitive advantage (Porter et al., 2014).

The success of an ecosystem is positively influenced by the variety and complementarity of the activities of the SMEs, as well as the combination of competition and cooperation between companies (Boschma and Frenken, 2006). Morocco has been actively pursuing an industrial policy plan until 2020, which includes the development of an industrial ecosystems and cluster policy, aiming to promote equitable and sustainable wealth distribution at the national level (Ministry of Industry, Trade, Investment and Digital Economy of Morocco or MINCET, 2016).

Morocco's efforts to develop its economy and increase its competitiveness did not begin with the adoption of industrial ecosystems. Instead, the country implemented a series of economic and social reforms aimed at promoting sustainable development and accelerating its structural transformation. These included the National Initiative for Human Development (NIHD) (Mouime and Benkassmi, 2012), the Green Morocco Plan (Ministry of Agriculture, 2008), the National Pact for Industrial Emergence (Ministry of Economy and Finance of Morocco, 2009), and the last Industrial Acceleration Plan (PAI) (Bouayad and Eddelani, 2008).

Indeed, industrial ecosystems aim to create a positive dynamic throughout the sector by encouraging strategic partnerships between large companies and SME (Henderson and Clark, 1990). The goal is to stimulate innovation, increase productivity, and strengthen the competitiveness of the entire industrial sector. Thanks to this new approach, small and medium-sized enterprises can access resources and skills that they would not have been able to acquire otherwise. Large companies, on the other hand, can benefit from the agility and creativity of small businesses, as well as their ability to innovate quickly (Becattini and Rullani, 1996).

Moreover, industrial ecosystems contribute to the creation of sustainable local jobs. By encouraging business growth and innovation, ecosystems can attract new investments and strengthen the region's attractiveness (Asheim et al., 2011). In summary, industrial ecosystems are a promising new approach to stimulate economic growth and create sustainable jobs. By promoting collaboration between large companies and SME, ecosystems can strengthen the competitiveness of the entire industrial sector and contribute to a more resilient and prosperous economy.

Overall, the emergence of ecosystems in Morocco is a positive development for the country's economy, with the potential to bring significant benefits to local communities and businesses. By promoting regionalised production and innovation, these ecosystems

can help to create new economic opportunities and drive long-term growth in the country (Ministry of Industry, Trade, Investment and Digital Economy of Morocco, 2019). As Morocco continues to develop its industrial sector and focus on promoting economic growth, the role of these ecosystems is likely to become increasingly important, highlighting the need for continued research and evaluation to support their ongoing development and success (Ghisetti et al., 2015).

2 The global transformation of the Moroccan automotive ecosystem

2.1 Morocco's 2022 rise in global automotive value chain

Morocco has become a notable player in the global automotive industry, with a production of 464,864 vehicles in 2022 (OICA, 2022), marking a tenfold increase in a decade. This places Morocco as the second-largest car exporter to the EU in Africa, after South Africa, and ahead of Algeria and Egypt (see Table 1). This growth can be attributed to the establishment of an assembly plant by Renault near Tanger in Melloussa in 2011, with an initial capacity of 360,000 vehicles per year, as part of the national industrialisation process known as 'Made in Morocco' (Benabdeljlil et al., 2016).

The production capacity of Morocco's automotive sector has also seen significant expansion, with Renault's factories producing 400,000 vehicles in 2018 and PSA's capacity expected to reach 200,000 vehicles. The total production capacity is projected to reach 700,000 vehicles by the end of the PAI, which is 70% of the revised target of 1 million vehicles by 2023 (Ministry of Industry, Trade, Investment and Digital Economy of Morocco, 2019).

In fact, Renault Group Morocco has exceeded its commitments with the Kingdom by achieving a local integration rate of 65.2% in 2022, surpassing the target of 65% by 2023[1]. The local sourcing revenue also exceeded expectations, reaching 2.1 USD billion in 2022 compared to a target of 1.7 USD billion by 2023, representing a 40% increase from 2021. These achievements were made possible through close collaboration between stakeholders and reinforce Renault's position as a major economic player in the Kingdom. The success story continues with plans for production of a 100% electric vehicle and the first hybrid vehicle in Morocco, further supporting Renault's ecosystem and its development (Padri, 2017).

Also, Sttellantis Group Morocco (Ex-PSA Group), is committed to electric vehicles and local sourcing. The Kénitra plant, inaugurated in June 2019, has a local integration rate of 60% for the new Stellantis car brands and has been instrumental in the production of the others foreign brands (Flanders Investment & Trade, 2015). Stellantis works with 66 local suppliers and aims to exceed 1 USD billion in local sourcing in 2022 to support its operations in Morocco and the Iberian Peninsula. The worldwide group focus on electric vehicles and local sourcing is supposed to drive the sustainable development of the automotive ecosystem in Morocco and promote the adoption of electric mobility in the Kingdom.

The Moroccan government has chosen to facilitate and support the 'off shoring of foreign automakers in search of low-cost production factors' as part of its public policy in response to the global economic situation. The PAI, also known as the National Industrial Acceleration Plan[2] (2009–2020), aims to develop the automotive sector in terms of sourcing and manufacturing. This includes the establishment of new-generation industrial

parks known as P2i, two of which are designated as free zones to attract foreign direct investment in the automotive industry.

These free zones are located in Kenitra and Tangier. The P2i (The Integrated Industrial Platforms) confirms the automotive sector as a priority sector with significant industrial potential. The Ministry of Industry aims to build complete value chains in key areas for economic growth and job creation through the development of industrial ecosystems. Performance contracts signed between the government, AMICA (Moroccan Association for the Automotive Industry and Trade), and leading international companies aim to increase local sourcing, particularly by attracting new foreign investments from tier 1 and tier 2 suppliers, in order to reduce the high level of imported vehicle parts and increase automotive contractor's local integration.

Table 1 World motor vehicle production by country/region

Vehicles unit	*YTD 2019*	*YTD 2020*	*YTD 2021*	*YTD 2022*	*VAR 2022/ 2019*	*VAR 2022/ 2020*	*VAR 2022/ 2021*
All vehicles	*Q1–Q4*	*Q1–Q4*	*Q1–Q4*	*Q1–Q4*			
Europe	21,531,339	16,904,429	16,338,165	16,21,888	–25%	–4%	–1%
Africa (excluding Egypt.)	1,095,151	776,247	907,302	1,022,783	–7%	32%	13%
Algeria	60,012	754	5,208	2,773	–95%	268%	–47%
Morocco	403,218	328,280	403,007	464,864	15%	42%	15%
South Africa	631,921	447,213	499,087	555,889	–12%	24%	11%

Source: OICA (2022)

The production capacity of Morocco's automotive sector has also seen significant expansion, with Renault's factories producing 402,000 vehicles in 2018 and PSA's capacity expected to reach 200,000 vehicles. The total production capacity is projected to reach 700,000 vehicles by the end of the PAI, which is 70% of the revised target of 1 million vehicles by 2025.

The Moroccan automotive sector has achieved a strong performance, with over 11.289 USD billion in export revenues as of the end of 2022, compared to 8.368 USD billion for the same period in 2021, representing a growth of 33 %, according to data from the Moroccan Office des Changes (Office des Changes, 2023). Despite the crisis, automotive exports have continued to increase, exceeding 8 USD billion in 2021, a rise of 15.9% compared to 2020, making Morocco the top exporter of cars from Africa to the European Union (*ibidem*.).

With an annual production capacity of 700,000 vehicles, driven by Renault and Stellantis ecosystems, the Moroccan automotive industry is strengthening its position in the global automotive value chain, surpassing the target of 600,000 vehicles set for 2020 (Ministère de l'Économie et des Finances, 2023). As a result, Morocco has become the second-largest car producer in Africa (https://www.morocconow.com/automotives.html), after South Africa. Cars produced in Morocco are destined for over 74 global destinations, with a local integration rate in the automotive industry reaching 63%. The sector has also contributed to the creation of 220,000 jobs between 2014 and 2021, with over 250 national and international suppliers and manufacturers (Ministry of Industry, Trade, Investment and Digital Economy of Morocco, 2021).

Table 2 Top ten sectors with highest export revenue in 2022 in million USD

Sector	*2022*	*2021*	*Variation*	*Variation (%)*
Phosphates	11,548	8,027	+3,521	+43.9%
Automobile	11,129	8,368	+2,761	+33.0%
Sector	*2022*	*2021*	*Variation*	*Variation (%)*
Construction	5,515	3,940	+1,575	+40.0%
Cabling	3,260	2,530	+0.730	+28.9%
Agriculture and Agri-food	8,124	6,989	+1,135	+16.2%
Food industry	4,386	3,659	+0.727	+19.9%
Agriculture, forestry and hunting	3,493	3,135	+0.358	+11.4%
Textile and leather	4,396	3,642	+0.754	+20.7%
Ready made clothing	2,760	2,265	+0.496	+21.9%
Hosiery articles	0.847	0.753	+0.094	+12.5%

Notes: *All foreign trade data is compiled based on customs declarations. 1 USD ≈10 MAD.

Source: Office des Changes (2023)

The table highlights the significant growth of the automotive industry in Morocco in 2022. With a revenue of 11.129 USD million, the automotive sector experienced a notable increase of 2.761 USD million compared to the previous year. This represents a substantial growth rate of 33.0%, showcasing the advancement and expansion of the automotive industry in Morocco. This positive trend underscores the increasing significance and contribution of the automotive sector to the economy of Morocco.

2.2 Paradigm shift: challenges of the Moroccan automotive ecosystem

One of the challenges faced by the global automotive industry is the transformation of global value chains (GVC). The rapid globalisation of manufacturing has been driven by factors such as widespread digital information, development of physical and financial infrastructure, computer-aided manufacturing technologies, and the proliferation of bilateral and multilateral trade agreements. These factors have enabled the disaggregation of GVC into complex global networks, allowing companies to interact in design, materials and components sourcing, and production from virtually anywhere while catering to customer needs almost everywhere (Antràs and Chor, 2013).

The global automotive industry is facing two inexorable trends that require preparation:

1 Increased uncertainty: technology has both destroyed jobs and created new ones, challenging the position of dominant players and making it difficult to predict market and revenue evolution (Schade, 2016).

2 Technological progress: is happening at a rapid pace, with disruptive changes that require agility. Decision-making timelines need to be shortened, and the lifespan of businesses has become very short (Lema et al., 2018).

In the context of the Moroccan automotive industry, these trends are also relevant. As the industry strives to position itself as a competitive player in the global automotive market,

it needs to address the challenges of increasing uncertainty and the need for speed and agility. This includes adopting advanced technologies, upskilling the workforce, building flexible and agile supply chains, and fostering an innovation-driven mindset (Jaadi et Msadfa, 2017).

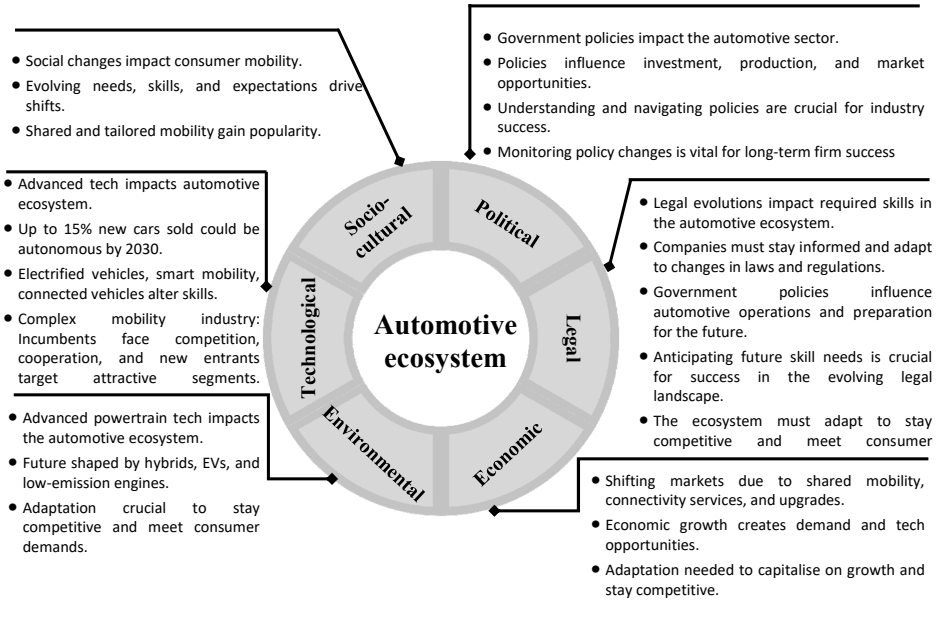
Ongoing technological changes and ecological transitions in the automotive industry are expected to redistribute value among stakeholders, reducing the share of value-added from physical production and creating opportunities for productivity gains in older industrial centres.

The dynamic capability view is crucial for assessing incumbent car manufacturers' organisational capabilities in the automotive industry. It involves integrating internal and external competences to gain competitive advantages and profitability (Schilke et al., 2018).

The importance of adopting a holistic approach to assessing dynamic capabilities has become crucial in the face of volatile, uncertain, complex, and ambiguous (VUCA) environments. Industries, such as the automotive sector, are undergoing significant transformations, challenging traditional and old business models (Van Tulder, 2004; Buckley and Enderwick, 2020; Schoemaker et al., 2018; Petricevic and Teece, 2019; Teece, 2019, 2007).

According to the policy paper 'The value chain of the automotive sector in Morocco in the post-COVID-19 perspective' by the Moroccan Institute of Strategic Intelligence, the convergence of disruptive technology-driven trends has the potential to transform the automotive industry in Morocco (IMIS, 2022). This PESTEL model of the external strategic environment in which automotive ecosystem operate in Morocco highlights various macro-environmental factors that can have a positive or negative influence on the firm's future activities and the challenges they face (see Figure 1).

Figure 1 External strategic environment of Moroccan automotive ecosystem



Source: Jaidi and Msadfa (2017)

Summarily, the Moroccan automotive ecosystem faces challenges in fostering innovation. The industry's ability to innovate and adapt to changing technologies and market demands is critical for its growth and competitiveness. This includes areas such as developing advanced powertrain technologies, meeting regulatory requirements for safety and emissions, addressing changing consumer mobility behaviours, and navigating evolving social and demographic factors. Additionally, the ecosystem must strive to attract and retain talent with the required skills for the automotive sector's future needs. To achieve this, the new roadmap for the automotive sector must build upon the previously identified foundations and ensure that government intervention supports the technological and industrial evolution of the sector.

The main points related to the *figure* on the challenges of the Moroccan automotive ecosystem are:

1 Embrace the future of automotive industries by focusing on talent development and fostering innovation as essential conditions for success.

2 Operationalise the engineering ecosystem to enhance the value-added of the Moroccan automotive sector, positioning it as a proposal force with the development of new concepts beyond production and subcontracting.

3 Accelerate the development of the powertrain ecosystem, which will give Morocco a unique and advantageous positioning with impressive upgrading capabilities.

4 Optimise energy performance and engage in the green mobility industry by producing decarbonised vehicles and selling them without carbon tax burden.

3 Literature review

In recent years, Morocco has emerged as an important player in the global automotive industry, with the establishment and development of automotive ecosystems. These ecosystems are characterised by the creation and animation of industrial clusters, bringing together leading large industrial companies and local SMEs in dedicated industrial zones with the aim of forming true technological value chains.

These ecosystems are built around targeted cooperation programs, resulting in long-term supply contracts and technology transfers. The automobile industry, in particular, has experienced significant changes in its production geography, with the components industry playing a crucial role in this spatial reorganisation due to its significant production and technological innovation contribution (Contreras et al., 2010). The GVC approach has emerged as a leading method for analysing these transformations (Chanaron, 2004; Lampón et al., 2016).

3.1 GVC approach

The process of globalisation has led to the fragmentation of production processes, where various stages of production are dispersed across different geographic locations, involving multiple supplier firms. This shift not only impacts the firms involved but also the territories they are connected to. The GVC concept refers to the decentralised distribution of production across multiple countries and companies, emphasising the

establishment of a supplier ecosystem. It also facilitates technology transfer and the adoption of best practices among the involved entities (Matus and Carrillo, 2020; Lampón et al., 2015).

The GVC approach offers a framework for spatial organisation, wherein specific regions wield influence over the distribution and coordination of production processes and technologies in other areas (Lung, 2004). This model is dynamic, allowing regions initially associated with lower value-added activities or limited decision-making authority to potentially upgrade within the GVC (Lampón, 2020).

Numerous studies have examined the concept of upgrading, with a specific focus on how local suppliers enhance their capabilities and expertise in production processes. Subsequently, the principles of sustainability, enduring governance, and collaborative innovation prompted the systemic outlook on GVC transformation. As a result, in today's uncertain and intricate landscape, stakeholders engaged in world class value chain find themselves compelled to shift from individual strategic considerations to embracing the co-creation of their environment (Jones et al., 2005; Arndt, 1997; Campa and Goldberg, 1997; Hummels et al., 2001; Gereffi et al., 2005; Grossman and Rossi-Hansberg; 2008; Strange and Humphrey, 2019; Lampón and Muñoz-Dueñas, 2023; Gereffi et al., 2021).

The GVC represents a worldwide approach that leverages the contributions and endeavours of national economies through the promotion of investments, learning, and synergistic collaborations. This environment further motivates multinational enterprises (MNEs) to externalise innovation to SME networks, and effectively mitigating country and investment-related risks while simultaneously enhancing business capabilities on a larger scale (Schmitz, 2004; Sturgeon et al., 2008).

Several studies have demonstrated that the emphasis on integrated global networks and local integration is clear, driven by company mergers and SMEs as GVC innovation sources. This accelerates the global connections of MNEs, suppliers, and SMEs, using clusters and innovation hubs for enhanced adaptability and knowledge transfer (Humphrey and Memedovic, 2003).

In the automotive industry, MNEs dominate value chains, wielding power over suppliers (Pavlínek and Zenka, 2016). Suppliers, however, can develop higher-value skills, disrupting power dynamics and chain structures (Schmitz, 2004; Giuliani, 2005; Manello et al., 2016), reducing MNEs' control needs that's based on asymmetrical power relationship. The link between car makers and suppliers in innovation is shaped by globalisation of production and the transfer of technological innovation to suppliers. Car makers demand global supply and technological capability from suppliers positioning themselves at higher GVC levels. Suppliers must innovate continuously to qualify for top GVC positions, often establishing R&D centres. This interaction underscores the importance of innovation and strategic positioning for SMEs suppliers (Pavlínek, 2012).

In regions with favourable institutions, change in initial positioning is possible, with a progress towards GVC core attributes through learning and technological development dynamics. Developing internal skills, tacit knowledge, and institutional support are essential for this evolution. Also, public policy, high-skilled workforce, and innovation infrastructure play crucial roles (Chu and Andreassi, 2011; Ibusuki et al., 2012, as cited in Lampón et al., 2016). The evolving mobility landscape has transformed the automotive value chain. Favourable institutions enable regions to shift their initial positions, progressing towards GVC core attributes through learning and technological development (Berger-Douce et al., 2018; Moyano-Fuentes et al., 2021; Mahmood et al., 2020; Huang and Chen, 2020).

Furthermore, collaboration with car manufacturers becomes vital for the new mobility companies, ensuring operational compatibility and communication system interoperability. The traditional product-oriented supply chain expands to encompass services related to data management and communication, aligning with the demands of autonomous and connected vehicles (Pavlínek and Zenka, 2016; Lampón et al., 2018; Möller and Haas, 2019; Thomopoulos and Givoni, 2015).

In this multifaceted process of integration, a universal formula for success remains elusive. While there are notable practices and insights to consider, it is essential to acknowledge that Morocco's trajectory within GVC will not necessarily be the same as the achievements of other nations. Indeed varied cultures, ecosystems, resources, technologies, market dynamics shape the landscape. In Morocco, focusing on human-centric projects that foster employment, while integrating advanced technologies and participating in complex value chains, appears optimal (Rodríguez Dela Fuente and Lampón, 2020). Bridging the gap between international and local actors is essential, as local engagement, capacity, and impact within the value chain are currently limited (Jaadi and Msadfa, 2017).

In the context of Morocco, the integration into GVC has gained even more significance due to the Covid-19 pandemic and the interconnected nature of value chains. This situation has prompted a re-evaluation of strategies involving various stakeholders such as government entities, business associations, communities, and citizen initiatives. This shift aligns with Morocco's sustainable development goals (SDGs) and the new development model (NDM) introduced in 2021, both of which emphasise the central role of local actors. So, a novel collaborative industrial model aims fostering the growth of local participants, attracting international investments with value-added roles, nurturing the growth of local clusters within industrial ecosystems, and facilitating the expansion of other activities attracted by the industrial prominence of major national firms or MNEs (Maâninou, 2009; Ministère de l'Économie et des Finances, 2023).

3.2 Literature review on the innovation and industrial ecosystems: key concepts

The landscape of innovation has undergone significant changes in recent years, with a growing emphasis on collaborative frameworks and open innovation approaches. This shift has been explored by practitioners and academics alike. SMEs are now engaging in strategic partnerships and alliances that combine collaboration and competition, with the ability to form and dissolve such relationships rapidly in response to changing market dynamics (Gulati et al., 2012; Möller and Rajala, 2007).

Concurrently, the approach to new product management has also evolved, moving away from a sole focus on optimising internal resources and external factors along the value chain, towards more collaborative and open innovation models (Chesbrough et al., 2018; Baldwin and Von Hippel, 2011; Li, 2009).

As a result, industries have increasingly embraced collaborative relationships in various forms, ranging from optimised supplier management to extended enterprises, and ultimately, to the formation of innovation ecosystems (Scott and Davis, 2016; Hienerth et al., 2014). Innovation ecosystems entail the creation and animation of industrial ecosystems that bring together industry leaders and SMEs in a dedicated industrial zone, with the aim of building technological value chains.

These innovation ecosystems are characterised by dynamic and agile collaborations among different stakeholders, including companies, research institutions, and government bodies, all with the shared goal of fostering innovation, competitiveness, and sustainable growth. The advent of innovation ecosystems represents a significant shift in how automotive industries approach collaboration, competition, and innovation. It highlights the changing nature of business relationships and the increasing recognition of the importance of collaboration and innovation in today's rapidly evolving markets (Oh et al., 2016).

Innovation ecosystems are dynamic and complex environments that offer both opportunities and challenges (Adner, 2006). The successful delivery of end-user value innovations depends on the effective performance of all elements within a family of complementary innovations (*Ibidem*). However, these achievements are often hindered by factors such as technical difficulties, cultural and geographical distances, and divergent goals among ecosystem participants (Valkokari, 2015). This complexity is particularly amplified in high-technology and complex industries, such as automotive industry, which involves the development of advanced systems with long lifecycles and require collaboration among numerous suppliers and partners (Cilliers, 2005).

According to Moore (1993), the concept of a *business ecosystem* refers to a dynamic and interconnected system of interdependent actors. These actors include customers, agents, channels, sellers of complementary products and services, suppliers, and the firm itself, all of whom co-evolve within the ecosystem. In Moore's definition, a business ecosystem is characterised by the relationships and interactions among these actors, where their activities are interconnected and mutually dependent on each other's success (Peltoniemi, 2006).

The concept of a *business ecosystem*, as coined by Iansiti and Levien (2004), draws inspiration from ecology. In ecology approach, organisms exist in a complex web of interdependencies and co-evolve within a natural environment. By adopting an 'ecology approach', SMEs and other organisations can gain a deeper understanding of how different actors, such as customers, partners, competitors, and suppliers, interact and evolve within their ecosystem (Overholm, 2015; Gawer and Cusumano, 2002).

The concept of an *innovation ecosystem* builds upon the idea of a business ecosystem, but with a specific focus on innovation-driven goals (Adner and Kapoor, 2010). This concept goes beyond physical or virtual innovation activities around specific themes, such as electronics or mechatronics, and encompasses a broader perspective of creating or exploring and capturing or exploiting value from innovation, whether it be technological or business/entrepreneurial innovation (O'Reilly and Tushman, 2013).

The key players within innovation ecosystems include lead producers, suppliers, competitors, policy makers, intermediators, and public and private funding agencies, are typically localised within innovation hubs. These actors, along with their interdependencies, activities, positions, and connections, form the foundational constructs of innovation ecosystems (Adner, 2016).

An innovation ecosystem is a geographically bounded network of interdependent actors, including lead producers, suppliers, competitors, policy makers, intermediators, and public and private funding agencies, who collaborate and co-evolve over time to create and capture value from innovation activities. It emphasises the collaborative and interconnected nature of innovation, where multiple actors work together to foster a supportive environment for innovation-driven goals, either related to technological or non-technological innovation (Autio and Thomas, 2014).

Innovation management within innovation ecosystems presents unique characteristics and challenges (Arrow, 1998; Patel and Pavitt, 1995; Cohen and Levinthal, 1990; Laursen and Salter, 2014). It includes the 'Paradox of Openness':

1 Ideation: innovation as collaborative endeavour; overcoming complexity, uncertainty, and legitimacy challenges through the actor collaboration.

2 Shaping: navigating the uncertain landscape: creating and defining value in immature innovation ecosystems.

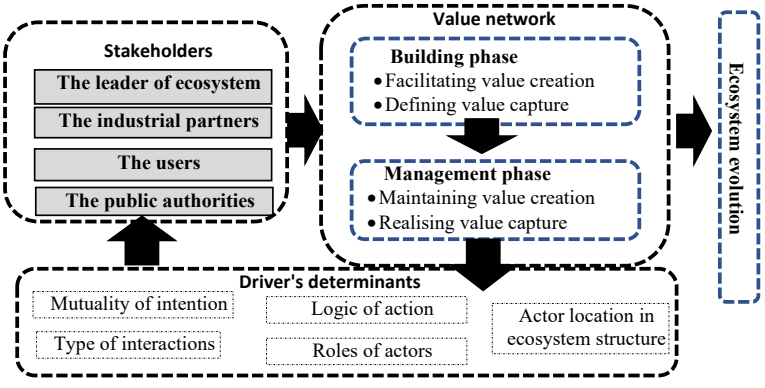
3 Experimentation: embracing uncertainty with learning, experimentation, and adaptation.

4 Preparation: a dynamic innovation ecosystem with nurturing knowledge creation, adaptation, and value capture through action and experimentation.

Dynamic capabilities are crucial for innovation ecosystems and value creation in a specific value chain. Creative decisions and strategies, along with skill assembly, play a significant role. The impact of the environment on management practices is essential (Porter et al., 2014).

Figure 2 presents a conceptual framework for exploring the automotive ecosystem. This framework is essential for understanding innovation management within these ecosystems, marked by unique challenges such as the 'Paradox of Openness.' It encompasses ideation, shaping, experimentation, and preparation phases, emphasising the critical role of dynamic capabilities and strategic decision-making in the context of evolving environments.

Figure 2 Conceptual framework to explore automotive ecosystem (see online version for colours)



Source: Adapted from Ritala and Hurmelinna-Laukkanen (2009)

Value creation and capture in the automotive ecosystem involve complex and dynamic interactions among actors, encompassing both tangible and intangible values. Tangible values, such as products and services, are exchanged for money and generate monetary flows. These exchanges are typically contractual or mandated, and failure to deliver may result in payment penalties (Ritala and Hurmelinna-Laukkanen, 2009).

On the other hand, intangible values go beyond the actual offerings and are not easily captured in traditional financial measures. Intangible values, such as knowledge

exchange, sense of community, customer loyalty, image enhancement, or co-branding opportunities, play a critical role in maintaining relationships, facilitating smooth operations, and keeping actors engaged in the ecosystem (Ritala et al., 2012).

The concept of a value network provides a useful framework for understanding the different value exchanges among actors in the ecosystem. It helps to consider the multiple value propositions that may coexist simultaneously within the ecosystem and influence each other. For example, urban passenger transportation in a given area involves a combination of public and private services, costs and revenues, user needs and solutions offered, government regulations and business policies, and other interconnected factors.

In the context of innovation ecosystems, value capture is a dynamic process that is closely intertwined with value creation. It encompasses two key aspects: capturing a share of the value that is collectively created within the ecosystem (Chesbrough et al., 2018).

To address these challenges within automotive ecosystem, our study focuses on exploring the opportunities and challenges of creative management within the context of the automotive ecosystem in Morocco, using semi-structured interviews as our research method. Through interviews with key stakeholders in the automotive industry in Morocco, we identify various factors influencing the transformation of the automotive ecosystem, including government policies, technological advancements, customer preferences, and competition.

Moreover, our research question to explore the phenomena is: ‘what opportunities and challenges does the evolution of the automotive ecosystem in Morocco present for actors, and how can creative management practices be utilised to capitalise on opportunities and address challenges of the automotive GVC?’.

4 Research methodology

4.1 Research design

Our research approach involves conducting semi-structured interviews with the key actors in the automotive ecosystem to explore the dynamics of the value network. Through these interviews, we aim to gain valuable insights into how value is created and captured within the ecosystem (Walser-Luchesi and Morel, 2001). We will be interviewing the main key actors, including leading SMEs and other stakeholders, to gather data on various aspects of the ecosystem, such as the role of the leading SMEs, the benefits and challenges of the ecosystem approach, criteria for selecting ecosystem members, governance mechanisms of collaboration, and strategies used for value creation and capture. These interviews will be designed to be flexible and allow for in-depth exploration of the topics of interest.

In addition to the primary data obtained through the interviews, we will also supplement our findings with secondary data from internal documents and publicly available materials. This research design will provide a comprehensive understanding of the value network dynamics within the automotive ecosystem and contribute to our understanding of this phenomenon.

4.2 Data source

Interviews are widely used in management sciences as a qualitative research method (Romelaer, 2005). They provide an opportunity for the interviewer to engage in a debate with the interviewee on a predefined subject.

Table 3 Research framework

Research elements	*Description*
Methods	Semi-structured interviews with public authorities and industrial partners
Data analysis	Qualitative data analysis based on data collection processes
Data sources	Interviews, internal documents, publicly available materials
Research design	Comprehensive understanding of value network dynamics within the automotive ecosystem
Contribution	Advancement of understanding of phenomenon

Through interviews, not only the ideas and thinking of the interviewee are clarified, but also the reality of the subject of the interview. In addition to interviews, records and reports regularly produced by the organisation can also serve as valuable data sources for the research (Susman and Evered, 1978).

In order to ensure that our objectives are achieved, we used a qualitative study through semi-structured interviews to accumulate knowledge (Thiétart, 2014). We contacted experts in the field who mostly operate in the automotive sector and are knowledgeable about innovation.

The average duration of each interview was 40 minutes, and all interviews were conducted face-to-face with the interviewees. The experts recommended that recording and transcription be kept anonymous. Therefore, we respected their request and used simple numbering. It is worth mentioning that there were a total of six interviews, and empirical saturation was reached after the fifth interview.

The interview guide used was based on five main axes:

1 Industry landscape and ecosystem dynamics (*actor location and ecosystem structure*).

2 Innovation processes and strategies (*facilitating, defining, realising and maintaining value*).

3 Management capabilities and resources (*logic of actions*).

4 Collaboration and networks (*type of interactions, mutuality of intentions*).

5 Ecosystem challenges and *performance (value network performance*).

4.3 Methods

The selection method for this study involved utilising semi-structured interviews as a qualitative research method to investigate the opportunities and challenges of innovative management in navigating the transformation of the automotive industry in Morocco. We conducted semi-structured interviews with key stakeholders in the Moroccan automotive industry, including government officials, industry experts, and company executives.

The purpose of the interviews was to gather in-depth insights into the factors that influence the transformation of the automotive ecosystem in Morocco, such as government policies, technological advancements, customer preferences, and competition.

This study related to the context aimed to investigate the opportunities and challenges arising from the transformation of the automotive ecosystem in Morocco for innovative management, and explore how creative management practices can be utilised to capitalise on opportunities and address challenges, as stated in the research question.

The conceptual framework in Figure 2 was used as a guide to explore the automotive ecosystem in the data analysis process.

Table 4 Profiles of institutional and professional experts

Interviewed	*Function*	*Establishment*
C#1	Ahead of Public Innovation Programs Department	The National Center for Technical and Scientific Research.
C#2	Senior Industrial Advisor for Moroccan Ministry of Industry	Consulting Agency
C#3	Financial Director	National automotive Startup
C#4	Commercial Director	Multi National Firm
C#5	Professor and Consultant	General Confederation of Moroccan Enterprises and Public Moroccan University
C#6	Plant Manager	Foreign automotive ecosystem leader

The utilisation of a small number of semi-structured interviews in this study can be justified through the principle of data saturation. Saturation occurs when the new data obtained from interviews no longer yield novel insights, indicating that the point of maximum understanding within the chosen sample size has been reached. Given the qualitative nature of the research purpose, focusing on depth rather than breadth, the interviews were conducted with key stakeholders in the Moroccan automotive industry, including government officials, industry experts, and company executives. These participants were carefully selected based on their positions and expertise, ensuring that their insights were representative of the industry's landscape and transformation.

5 Data analysis

5.1 Axe 1: industry landscape and ecosystem dynamics (actor location and ecosystem structure)

In Morocco, there are multiple contexts that have accompanied the genesis of ecosystems. Firstly, a royal vision was adopted since the 1999s and translated into government policies. This vision, aimed at opening up to new international markets, was accompanied by the creation of new industrial zones, establishment of investment operations, and provision of incentives such as land and financing for new projects.

> "The context that has led to the creation of business networks in Morocco is linked to the country's economic opening and the willingness of national stakeholders to establish such networks." (C#2)

In addition to the royal vision, Morocco has undergone significant transformation, making the country an attractive industrial production platform for international investors, and playing a facilitating role in the creation and evolution of industrial ecosystems. The country has adopted several economic policies and ambitious strategies for local industrial integration, aimed at reorganising various links in industrial value chains and positioning the kingdom of Morocco in the most promising international markets. In other words, the country has recognised the need to establish the foundations of a competitive and dynamic industrial fabric, and has consistently chosen to evolve and develop by involving various local actors in its progress policies. The following sentence is a translation of the statement from our interviewees that supports our results:

> "The context that has accompanied the emergence of ecosystems in Morocco is the royal vision adopted since the 1999s, which has been translated into government policies […]." (C#1)

This presents an opportunity for Moroccan SMEs and family firms to gain a competitive advantage that will enable them to be more competitive in the global market. Similarly, the structuring of certain industries into ecosystems around major manufacturers is explained by a combination of political, technological, and economic factors associated with these manufacturers. The following sentence is a translation of the statement from our interviewees that supports our results:

> "Morocco is transforming into an industrial powerhouse that is attracting international investors. To achieve this, several economic policies have been implemented […]" (C#6)

> "Territorialized networks in Morocco have significant potential, but they still lack private and public investments. The integration of these networks is a strategic approach that can provide a competitive advantage in the global market […]." (C#6)

> "Compared to other countries such as the European Union and the United States, territorialized networks in Morocco play a relatively small role in terms of numbers […]." (C#3)

5.2 Axe 2: innovation processes and strategies (facilitating, defining, realising and maintaining value)

The main actors in the automotive ecosystem are the major manufacturers, Tier 1 suppliers, and other component suppliers (tiers 2, tiers 3…). The leader manufacturers build the vehicles and control their production, being responsible for the quality of their products and seeking to minimise costs when sourcing components. They have the resources and capabilities to drive and implement collaborative approaches based on active participation of stakeholders in innovation processes, thanks to their solid training and experience, relevant skills in knowledge sharing and technology transfer, strong leadership, and dedicated R&D funding. As for the Tier 1 suppliers, they are increasingly integrated by these major manufacturers in product design and technical problem-solving approaches. The following sentence is a translation of the statement from our interviewees that supports our results:

> "Our company has always emphasized the importance of fostering a culture of innovation within the organization. We believe that innovation is not limited to just one department or team, but it should be embedded in every aspect of our

> business processes and strategies. We constantly encourage our employees to come up with new ideas, experiment with different approaches, and take calculated risks in order to drive innovation across the board […].” (C#4)

> “Collaboration and partnerships have been key for us in realizing value within the ecosystem. We understand that we cannot do everything on our own, and that by collaborating with other stakeholders within our ecosystem, we can create synergies and unlock new opportunities […].” (C#4)

Cooperation and competition are key characteristics of the automotive ecosystem. Cooperation is evident in the development of new technologies through innovation and knowledge sharing, while rivalry involves the competition among companies to create a competitive advantage in the market. Cooperation allows for convergence among companies, avoids logistics-related issues, and ensures effective communication along the distribution value chain. The following sentence is a translation of the statement from our interviewees that supports our results:

> “To gather, manage, and implement a collaborative approach around a project based on active participation of actors in innovation processes. Geographical proximity is a key factor in accessing and sharing resources and deploying innovation capabilities of SMEs. However, it is not the only factor that promotes innovation […].” (C#2)

Lastly, in terms of innovation support structures, there are various organisations that strengthen innovation projects, such as the Research and Development Technical Centre established by the leader car manufacturer Groups, and incubators that need to have the right expertise to provide effective guidance and support to young entrepreneurs and innovators in specific types of projects that require advanced technical skills and specialised funding.

> “To gather, manage, and implement a collaborative approach around a project based on active participation of actors in innovation processes. Geographical proximity is a key factor in accessing and sharing resources and deploying innovation capabilities of SMEs. However, it is not the only factor that promotes innovation […].” (C#2)

5.3 Axe 3: management capabilities and resources (logic of actions)

The culture of innovation is gaining momentum in Morocco, providing local companies with a distinctive competitive advantage. Specifically, older companies need to innovate in strategic, operational, organisational, and technological aspects. However, it is important to note that innovation must originate from the national context and government policies to be truly considered as such. The following sentence is a translation of the statement from our interviewees that supports our results:

> “In the Moroccan context, companies are obliged to innovate [...]. To exist in the market, they must evolve, industrialize, and seek new technologies. Innovation is becoming a global culture that Moroccan companies are starting to adopt and a competitive advantage through which they can distinguish themselves [...].” (C#5)

Various forms of innovation, such as business model innovation, process innovation, organisational innovation, marketing innovation, and service innovation, are present in Moroccan SMEs. However, organisational innovation is particularly relevant in the Moroccan context as it offers significant added value.

> "The ecosystem aims to help SMEs/SMIs orient themselves towards innovation […], by implementing tools such as 'INNOVATION BROKERAGERS' and strengthening the absorption capacities of actors through targeted training and knowledge sharing. In reality, innovation can take several forms, such as business model innovation, process innovation, organizational innovation, technological innovation, or service innovation […]." (C#1)

In the automotive ecosystem, creative management practices in Morocco are primarily qualitative, aiming to improve the performance of companies and give an incremental added value to their products and services. Moreover, the Moroccan automotive ecosystem enables companies to reduce their dependence on resources and production factors, leading to the diffusion of innovative and evolving internal standards and processes, which provide advantages for Moroccan companies.

> "The main forms of innovation are those more related to management than the introduction of new technologies […]. As for the resources required for innovation, they include technology transfer, changes in customer behavior, and evolving consumer demand. For the influence of the industrial ecosystem on knowledge sharing, mutual trust, and diffusion of standards, large companies have more impact than SMEs on the automotive ecosystem dynamics […]." (C#4)

5.4 Axe 4: collaboration and networks (type of interactions, mutuality of intentions)

The factors and determinants that can influence the implementation of an innovation process in Morocco include access to skills and human resources, market access, the significance of public procurement, exportation, development of standards and regulatory bodies, international orientation of actors, improvement of GDP, establishment of a reliable legal framework, diversification of sectors, introduction of ambitious young entrepreneurs seeking internationalisation, company size, ecosystem size, organisational structure, and convergence of technological, socio-economic, and environmental factors, as well as cooperation between large manufacturers and SMEs. All these factors stimulate the collective innovation process aimed at realising the shared interests of stakeholders.

Companies are required to equip themselves with technical and financial resources to compete and thrive in an increasingly competitive and innovative market. Moreover, the role of human factors as the driving force behind innovation efforts should not be overlooked.

> "Moreover, SMEs may encounter difficulties due to their lack of resources and capabilities. To overcome these challenges, collaboration and partnerships can be effective solutions. For example, Office Cherifiènne des Phosphates (OCP), a large Moroccan group, has adopted an innovation strategy that has strengthened the innovative spirit of the new generation of engineers through its own university and public procurement, exportation, standardization, regulatory bodies, international orientation of stakeholders, improvement of GDP, establishment of a reliable legal framework, diversification of sectors […], and introduction of new young entrepreneurs with an ambition to internationalize." (C#2)

Indeed, it is important to note that the determinants for successful innovation in Moroccan SMEs are mainly of managerial nature. It is essential to break away from traditional management approaches that hinder the evolution and development of the company and instead foster a risk-taking and modernisation-oriented human capital.

Regarding cooperation between automotive car manufacturers and SMEs, it enables the evolution of innovative practices that help SMEs fulfil their social and economic responsibilities.

> "[…] all these factors help stimulate this collective innovation process with the goal of realizing this collective ambition […]" – This passage highlights the importance of collaboration, partnerships, and various factors that can stimulate innovation in the context of the Moroccan market […]." (C#5)

5.5 Axe 5: ecosystem challenges and performance (value network performance)

The automotive sector in Morocco still faces a range of difficulties and constraints that SMEs must contend with. In concrete terms, integrating innovation capabilities into the Moroccan automotive sector will enable companies to have a clear vision of the sector's strategic evolution and steer this vision to harness all available information on the skills and resources potentially required by the global market. Belonging to an innovative ecosystem will facilitate access to financial, technological, organisational, and even managerial resources.

> "There are ecosystem-specific characteristics related to innovation. This is explained by the emergence of literature on innovation ecosystem and science-based ecosystems, engineering departments, process-focused innovation, and product-focused innovation. This influence can be illustrated by the dominant design that promotes standards at the industrial ecosystem level and guides the innovation of ecosystem actors.[…]." (C#1)

> "[…] In Morocco, this influence comes from abroad because the local market does not have the tools for innovation. It has to align itself with those imposed by the international market […]."(C#1)

End-user preferences and demands: understanding and meeting customer and End-user preferences and demands is essential for the success of the automotive industry in Morocco. This issue may vary in terms of vehicle types, features, performance, and customisation options, and meeting these demands requires continuous market research, innovation, and customer-centric approaches.

6 Discussion

The evolving automotive landscape in Morocco presents opportunities and challenges. This addresses shared value issues by integrating social and environmental aspects, sustainable products, job creation, and balanced investment. Efforts are made to align with the industrial revolution and automation, ensuring Morocco's emergence in the automotive GVC.

The findings from the interviews highlight on several key aspects that can be interpreted and analysed in the context of existing literature and future challenges, with a focus on creative management practices.

6.1 Opportunities helping building automotive ecosystem

1 Access to a developed and high value-added ecosystem: the Moroccan automotive ecosystem stands out as one of the most developed and high-value sectors in the local economy. This positioning provides a compelling opportunity for stakeholders to harness the existing robust infrastructure, well-established supply chain, and expertise within the ecosystem. These advantages can be leveraged to significantly boost their innovation capabilities, thereby driving overall performance. The Moroccan automotive ecosystem offers significant opportunities for stakeholders to align their innovation efforts with the developmental goals of the country. Leveraging the strengths of the ecosystem, stakeholders can contribute not only to their own performance but also to regional and national development, which corresponds with the broader socio-economic objectives discussed in the literature review.

2 Contribution to regional and national development: the role of SMEs within the automotive ecosystem extends beyond industry-specific contributions. These SMEs are recognised as essential contributors to both regional and national development. This recognition provides a strategic avenue for stakeholders to synchronise their innovation endeavours with the overarching developmental objectives of the country.

   By aligning innovation efforts with these broader goals, actors within the automotive ecosystem can not only enhance their own performance but also secure valuable backing from policymakers and other key stakeholders. This synergy between innovation and developmental aspirations offers a pathway for sustained growth and mutual benefit within the Moroccan automotive landscape.

3 Collaboration and knowledge sharing: the notion of an innovation ecosystem, as discussed in the literature, underscores the significance of collaboration and knowledge exchange among participants in the automotive domain. This dynamic framework, as exemplified in the interviews, offers a fertile ground for actors to actively participate in collaborative innovation ventures. By embracing this collaborative ethos, stakeholders can leverage shared expertise, enabling the dissemination of best practices and fostering mutual learning. This proactive engagement within the innovation ecosystem empowers them to cultivate and augment their innovation capabilities, ultimately bolstering their capacity to navigate the transformative automotive landscape in Morocco.

6.2 Challenges facing mechanisms building an efficient automotive ecosystem

1 Dependence on external sources of innovation: the insights derived from the interviews align with the literature, emphasising the prevalent dependence of SMEs in the automotive ecosystem on external sources for innovation. This observation reflects a significant challenge, as indicated by Contreras et al. (2010) in the context of the automotive industry's spatial reorganisation. The limited local innovation capabilities underscore the necessity for actors to proactively address this challenge. To achieve sustainable growth, it becomes imperative for these stakeholders to strategically reduce their reliance on external sources and focus on cultivating indigenous innovation capabilities.

2 Zero emission and sustainability concerns: the global focus on zero emission and sustainability in the automotive industry presents a challenge for actors to transition towards alternative propulsion systems, reduce CO_2 emissions, and adopt sustainable practices. This may require significant investments in research and development, infrastructure, and policy changes. This aligns with the broader global trends discussed in the literature, such as the evolving mobility landscape and the need for favourable institutions to support sustainable development (Berger-Douce et al., 2018; Lampón et al., 2016; Mahmood et al., 2020; Huang and Chen, 2020).

3 Respond efficiently to the end-user's needs: educating customers about the range capabilities of friendly environment power, improving battery technology, and expanding the charging infrastructure network can help address range anxiety concerns and build customer confidence in adopting new solutions, enhancing their overall experience and satisfaction. Authors such as Lampón et al. (2015a) discuss the significance of collaborating with various stakeholders, including customers, to enhance the adoption of innovative solutions and improve overall satisfaction.

6.3 Creative management practices for value creation and capture within automotive ecosystem

1 Need for creative management practices: addressing the dynamic opportunities and challenges within the evolving Moroccan automotive ecosystem demands creative management practices. Key players must embrace innovative strategies, nurture a culture of innovation, foster collaborative networks, and prioritise research and development initiatives. These practices are essential to harnessing opportunities and effectively overcoming challenges, aligning with the principles discussed in the literature review that emphasise collaboration, innovation, and strategic approaches in the context of the automotive industry.

2 Foster a culture of innovation: nurturing a culture of innovation is paramount for actors within the Moroccan automotive ecosystem. By actively fostering an environment that encourages creativity, experimentation, and calculated risk-taking, organisations can tap into the rich potential outlined in the literature review. Leadership support is crucial in driving this cultural shift, strengthened by well-structured employee training programs (education, training, etc.) and natural capital (natural and cultural resources). Moreover, acknowledging and rewarding innovative ideas not only empowers individuals but also fuels the collaborative spirit essential for adapting to the evolving industry landscape, aligning closely with the themes of collaborative innovation and knowledge sharing highlighted in the literature review.

3 Promote collaborative networks: in the context of adaptation, which refers to the ability to navigate extreme changes and capitalise on opportunities while managing potential damage, fostering collaborative networks becomes a pivotal aspect for actors within the automotive ecosystem. These networks involve partnerships with other SMEs, universities, research institutions, and industry associations, serving as a vital mechanism for enhancing adaptive capacity. By engaging in collaborative networks, actors can share knowledge, conduct joint research and development, and collectively drive innovation efforts. This aligns perfectly with the overarching

concept of adaptation, where the evaluation of a country's or company's adaptive capacity spans various factors, including social and human capital, the scale of the industry or economy, education levels, and the effectiveness of governance structures. Such collaborative efforts strength the resilience of actors within the automotive industry, and empower them to effectively address challenges and seize emerging opportunities within the automotive GVC.

4 Invest in research and development: actors within the automotive ecosystem can strategically allocate resources to improve their local innovation capabilities. This entails establishing dedicated research and development centres, forming collaborative partnerships with prominent research institutions, and committing resources to fuel innovative projects. Such proactive investment aligns seamlessly with the concept of adaptation, which underscores the critical importance of leveraging available resources, including research capabilities, to navigate the evolving landscape of the automotive industry.

5 Embrace sustainable practices: actors can adopt sustainable practices, such as investing in zero emission technologies, developing eco-friendly products, and implementing green manufacturing processes. This can help address the challenges of zero emission and sustainability concerns and position actors as environmentally responsible.

6 Engage with policymakers and stakeholders: firms (MNEs or SMEs/SMIs) can engage with policymakers and stakeholders to shape the regulatory environment, advocate for supportive policies, and gain access to funding and resources. This can involve participation in industry forums, policy dialogues, and advocacy efforts to create an enabling environment for innovation and sustainable growth. This multifaceted approach holds substantial potential in shaping a conducive regulatory landscape that aligns with the unique needs and challenges of the industry.

This engagement is a dynamic process, one that requires continuous dialogue, advocacy, and a shared commitment to the growth and sustainability of the automotive ecosystem. By forging strong connections with policymakers and stakeholders, actors can co-create an environment that not only addresses the current challenges but also anticipates and prepares for future developments, ensuring the industry's resilience, innovation, and long-term success.

7 Conclusions

In summary, the Moroccan automotive industry is at a critical stage, presenting both opportunities and challenges. The findings discussed emphasise the importance of innovative management approaches, collaboration, and sustainability for its growth. The industry's strong position as a developed sector creates a solid foundation to leverage existing strengths and innovation potential, contributing not only to individual success but also to regional and national progress.

However, there are clear challenges to address. The reliance on external sources for innovation, in line with prior research (Dutrénit and Vera-Cruz, 2005), calls for urgent investments in building local innovation capabilities. Addressing environmental

concerns, particularly the shift toward zero emissions, is crucial to stay in line with global trends and minimise environmental impact. Meeting customer needs efficiently, as pointed out, requires education on new solutions to overcome doubts.

Fostering an innovation culture, as highlighted, is a central strategy, driven by leadership support, training, and recognition of innovative ideas (Hahn and Auktor, 2017). This aligns with the concept of adaptation discussed, which emphasises responding effectively to change using available resources, such as social and human capital, education, and governance structures, to tackle challenges and seize opportunities.

Promoting collaborative networks like automotive ecosystem, a recurring theme, aligns seamlessly with the concept of adaptation. These networks, formed through partnerships with research institutions, universities, and industry associations, enhance adaptive capacity and foster knowledge exchange for both MNEs and SMEs (Hoeft, 2020). Engaging policymakers and stakeholders is vital in shaping the regulatory environment, advocating for supportive policies, and securing resources for growth. These strategies resonate with the broader principles of collaboration, innovation, and strategic adaptation within the automotive industry, as highlighted in the literature review.

While this discussion provides valuable insights, there are limitations. The study primarily relies on interviews, and further research, possibly including surveys or longitudinal data, would offer a more comprehensive understanding of the challenges and opportunities in the Moroccan automotive ecosystem. Additionally, a more in-depth examination of specific policies' impact on innovation and sustainability would enrich the analysis.

Future research should explore the effectiveness of policies in fostering innovation, dive deeper into collaborative network dynamics, and quantitatively assess the adaptive capacity of actors within the automotive GVC. Moreover, examining the role of advanced technologies, like artificial intelligence, big data, and the internet of things, within the automotive ecosystem and their impact on innovation and sustainability, is essential for a comprehensive understanding.

In conclusion, the Moroccan automotive industry's future success is based on creative management, collaboration, innovation, and sustainable strategies. These factors will enable the industry to seize opportunities and overcome challenges, fostering a resilient and thriving automotive ecosystem contributing to local and national development while aligning with global sustainability goals.

References

Adner, R. (2006) 'Match your innovation strategy to your innovation ecosystem', *Harvard Business Review*, Vol. 84, No. 4, p.98.

Adner, R. and Kapoor, R. (2010) 'Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations', *Strategic Management Journal*, Vol. 31, No. 3, pp.306–333.

Antràs, P.A. and Chor, D. (2013) 'Organizing the global value chain', *Econometrica*, Vol. 81, No. 6, pp.2127–2204.

Arndt, S.W. (1997) 'Globalization and the open economy', *The North American Journal of Economics and Finance*, Vol. 8, No. 1, pp.71–79.

Arrow, K.J. (1998) 'Innovation and increasing returns to scale', in Arrow, K.J., Ng, Y.K. and Yang, X. (Eds.): *Increasing Returns and Economic Analysis*, Palgrave Macmillan.

Asheim, B., Boschma, R. and Cooke, P. (2011) 'Constructing regional advantage: platform policies based on related variety and differentiated knowledge bases', *Regional Studies*, Vol. 45, No. 7, pp.893–904.

Autio, E. and Thomas, L. (2014) 'Innovation ecosystems', in Dodgson, M. and Gann, D. (Eds.): *The Oxford Handbook of Innovation Management*, pp.204–288, Oxford University Press.

Baldwin, C. and Von Hippel, E. (2011) 'Modeling a paradigm shift: from producer innovation to user and open collaborative innovation', *Organization Science*, Vol. 22, No. 6, pp.1399–1417.

Becattini, G. and Rullani, E. (1996) *Local Systems and Global Connections: The Role of Knowledge*', Research Series – International Institute for Labour Studies, pp.159–174.

Berger-Douce, S., Gautier, A. and De Benedittis, J. (2018) 'La transition numérique, un levier de création de valeur partagée en PME', in *Journée AEI-AIREPME 'Entrepreneuriat et PME: question (s) de valeur (s)*, *Semaine du Management FNEGE 2018*, May, p.24.

Boschma, R.A. and Frenken, K. (2006) 'Why is economic geography not an evolutionary science? Towards an evolutionary economic geography', *Journal of Economic Geography*, Vol. 6, No. 3, pp.273–302.

Bouayad, A. and Eddelani, O. (2008) *Cluster: Écosystème d'Innovation, Incubateur d'Organisations Compétitives et de Territoires Intelligents (Cas de Fès-Boulmane au Maroc)*.

Buckley, P.J. and Enderwick, P. (2020) 'Rising regionalization: will the post-COVID-19 world see a retreat from globalization?', *Transnational Corporations Journal*, Vol. 27, No. 2, p.2020.

Campa, J.M. and Goldberg, L.S. (1997) *The Evolving External Orientation of Manufacturing Industries: Evidence from Four Countries*, NBER Working Paper Series, 5919.

Chanaron, J.J. (2004) 'Relationships between the core and the periphery of the European automotive system', *International Journal of Automotive Technology and Management*, Vol. 4, Nos. 2–3, pp.198–222.

Chesbrough, H., Lettl, C. and Ritter, T. (2018) 'Value creation and value capture in open innovation', *Journal of Product Innovation Management*, Vol. 35, No. 6, pp.930–938.

Chu, D. and Andreassi, T. (2011) 'Management of technological innovation: case studies in biotechnology companies in Brazil', *Journal of the Iberoamerican Academy of Management*, Vol. 9, No. 1, pp.7–31.

Cohen, W.M. and Levinthal, D.A. (1990) 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, Vol. 35, No. 1, pp.128–152, Cornell University, New York.

Contreras, O.F., Carrillo, J. and Estrada, J.A. (2010) 'The creation of local suppliers within global production networks: the case of the ford motor company in Hermosillo, Mexico', *The Prospects and Limits to the Development of the Automotive Periphery*, p.42.

Dutrénit, G. and Vera-Cruz, A.O. (2005) 'Spillovers from MNCs through worker mobility and technological and managerial capabilities of SMEs in Mexico', *Innovation*, Vol. 7, Nos. 2–3, pp.274–297.

Flanders Investment & Trade (2015) *L'automobile au Maroc: Un secteur en pleine expansion* [online] https://www.flanderstrade.be/fr/marches/maroc/secteurs-d-activites-sectoren/automobile (accessed 1 May 2023).

Gawer, A. and Cusumano, M.A. (2002) *Platform Leadership: How Intel, Microsoft, and Cisco Drive Industry Innovation*, Vol. 5, pp.29–30, Harvard Business School Press, Boston.

Gereffi, G., Humphrey, J. and Sturgeon, T. (2005) 'The governance of global value chains', *Review of International Political Economy*, Vol. 12, No. 1, pp.78–104.

Gereffi, G., Lim, H.C. and Lee, J. (2021) 'Trade policies, firm strategies, and adaptive reconfigurations of global value chains', *Journal of International Business Policy*, Vol. 4, No. 4, pp.506–522.

Ghisetti, C., Crespi, F. and Quatraro, F. (2015) 'Environmental and innovation policies for the evolution of green technologies: a survey and a test', *Eurasian Business Review*, Vol. 5, No. 2, pp.343–370.

Giuliani, E. (2005) 'Cluster absorptive capacity: why do some clusters forge ahead and others lag behind?', *European Urban and Regional Studies*, Vol. 12, No. 3, pp.269–288.

Grossman, G.M. and Rossi-Hansberg, E. (2008) 'Trading tasks: a simple theory of offshoring', *American Economic Review*, Vol. 98, No. 5, pp.1978–1997.

Gulati, R., Wohlgezogen, F. and Zhelyazkov, P. (2012) 'The two facets of collaboration: cooperation and coordination in strategic alliances', *Academy of Management Annals*, Vol. 6, No. 1, pp.531–583.

Hahn, T. and Auktor, G.V. (2017) *The Effectiveness of Morocco's Industrial Policy in Promoting a National Automotive Industry*, Discussion Paper No. 27.

Henderson, R.M. and Clark, K.B. (1990) 'Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms', *Administrative Science Quarterly*, Vol. 35, No. 1, pp.9–30.

Hienerth, C., Von Hippel, E. and Jensen, M.B. (2014) 'User community vs. producer innovation development efficiency: a first empirical study', *Research Policy*, Vol. 43, No. 1, pp.190–201.

Hoeft, F. (2020) *Assessing Organizational Capabilities of Incumbent Car Manufacturers in Light of Current Influencing Factors*, Gerpisa Colloquium, Paris [online] http://gerpisa.org/en/node/6055 (accessed 14 June 2023).

Huang, J. and Chen, X. (2020) 'Domestic R&D activities, technology absorption ability, and energy intensity in China', *Energy Policy*, Vol. 138, pp.111–184.

Hummels, D., Ishii, J. and Yi, K.M. (2001) 'The nature and growth of vertical specialization in world trade', *Journal of International Economics*, Vol. 54, No. 1, pp.75–96.

Humphrey, J. and Memedovic, O. (2003) *The Global Automotive Industry Value Chain: What Prospects for Upgrading by Developing Countries*, UNIDO Sectorial Studies Series Working Paper.

Iansiti, M. and Levien, R. (2004) 'Strategy as ecology', *Harvard Business Review*, Vol. 82, No. 3, pp.68–78.

Ibusuki, U., Kobayashi, H. and Kaminski, P.C. (2012) 'Localization of product development based on competitive advantage of location and government policies: a case study of car makers in Brazil', *International Journal of Automotive Technology and Management*, Vol. 12, No. 2, pp.172–196.

IMIS (2022) *The Value Chain of the Automotive Sector in Morocco, in Perspective Post-COVID-19 Crisis*, Policy Paper, Moroccan Institute of Strategic Intelligence.

Jaidi, L. and Msadfa, Y. (2017) *La Complexité de la Remontée des Chaînes de Valeur Mondiale: Cas des Industries Automobile et Aéronautique au Maroc et en Tunisie/The Complexity of the Rise of Global Value Chains: The Case of Automotive and Aeronautics Industries in Morocco and Tunisia*, OCP Policy Center, Policy Paper, p.52.

Jones, R., Kierzkowski, H. and Lurong, C. (2005) 'What does evidence tell us about fragmentation and outsourcing?', *International Review of Economics & Finance*, Vol. 14, No. 3, pp.305–316.

Jullien, B. and Smith, A. (2012) 'Le Gouvernement d'une Industrie: Vers une Économie Politique Institutionnaliste Renouvelée', *Gouvernement & Action Publique*, Vol. 1, No. 1, pp.103–123.

Lampón, J.F. (2020) 'The impact of uncertainty on production relocation: implications from a regional perspective', *Papers in Regional Science*, Vol. 99, No. 3, pp.427–446.

Lampón, J.F. and Muñoz-Dueñas, P. (2023) 'Are sustainable mobility firms reshaping the traditional relationships in the automotive industry value chain?', *Journal of Cleaner Production*, Vol. 413, Article No. 137522.

Lampón, J.F., Cabanelas, P. and Delgado Guzmán, J.A. (2018) 'Claves en la evolución de México dentro de la Cadena de Valor Global de la industria de autopartes: El caso del Bajío', *El Trimestre Económico*, Vol. 85, No. 3, pp.483–514.

Lampón, J.F., Lago.Peñas, S. and Cabanelas, P. (2016) 'Can the periphery achieve core? The case of the automobile components industry in Spain', *Papers in Regional Science*, Vol. 95, No. 3, pp.595–612.

Lampón, J.F., Lago-Peñas, S. and González.Benito, J. (2015) 'International relocation and production geography in the European automobile components sector: the case of Spain', *International Journal of Production Research*, Vol. 53, No. 5, pp.1409–1424.

Laursen, K. and Salter, A.J. (2014) 'The paradox of openness: appropriability, external search and collaboration', *Research Policy*, Vol. 43, No. 5, pp.867–878.

Lema, R., Rabellotti, R. and Gehl Sampath, P. (2018) 'Innovation trajectories in developing countries: co-evolution of global value chains and innovation systems', *The European Journal of Development Research*, Vol. 30, No. 3, pp.345–363.

Maâninou, A. (2009) 'Evolution Recent et Avenir de industry Automobile au Maroc', *Critique Économique*, No. 24.

Mahmood, W., Azlan., U. and Wan., H. (2020) 'QFD approach in determining the best practices for green supply chain management in composite technology manufacturing industries', *Malaysian Journal on Composite Science and Manufacturing*, Vol. 1, No. 1, pp.45–56.

Manello, A., Calabrese, G.G. and Frigero, P. (2016) 'Technical efficiency and productivity growth along the automotive value chain: evidence from Italy', *Industrial and Corporate Change*, Vol. 25, No. 2, pp.245–259.

Matus, M. and Carrillo, J. (2020) 'Will the Mexican auto parts Maquilas be able to transition to I4.0?', Paradigma Económico. *Revista de Economía Regional y Sectorial*, Vol. 12, No. 2, pp.39–61.

Ministère de l'Économie et des Finances (2023) *Draft Budget Law*, The Government Council Adopts the Finance Bill of 2023, Morocco [online] https://www.finances.gov.ma (accessed 2 June 2023).

Ministry of Agriculture (2008) *Green Morocco Plan: Promoting Sustainable Agricultural Development for Economic Growth*, Ministry of Agriculture, Rabat [online] https://www.agriculture.gov.ma/sites/default/files/investors_guide_in_the_agricultural_sector_in_morocco.pdf (accessed 15 April 2023).

Ministry of Economy and Finance of Morocco (2009) 'Spécialisation et concentration industrielles: Atouts et vulnérabilités des secteurs et des régions', *Direction des études et prévision financière* [online] https://www.finances.gov.ma (accessed 18 April 2023).

Ministry of Industry, Trade, Investment and Digital Economy of Morocco (2016) *Industrial Acceleration Plan* [online] http://www.mcinet.gov.ma/en/content/industrial-acceleration-plan-2014-2020 (accessed 2 February 2023).

Ministry of Industry, Trade, Investment and Digital Economy of Morocco (2019) *Pacte National pour l'Emergence Industrielle: Contrat Programme 2009-2015*, Rabat, p.90 [online] http://www.mcinet.gov.ma/en/content/industrial-acceleration-plan-2009-2015.

Ministry of Industry, Trade, Investment and Digital Economy of Morocco (2021) *4e RDV de l'industrie, edition automobile* [online] https://www.mcinet.gov.ma/fr/actualites/4e-rdv-de-lindustrie-edition-automobile (accessed 2 January 2023).

Möller, D.P.F. and Haas, R.E. (2019) 'The automotive industry', in *Guide to Automotive Connectivity and Cybersecurity*. *Computer Communications and Networks*, Springer, Cham.

Möller, K. and Rajala, A. (2007) 'Rise of strategic nets – new modes of value creation', *Industrial Marketing Management*, Vol. 36, No. 7, pp.895–908.

Moore, J.F. (1993) 'Predators and prey: a new ecology of competition', *Harvard Business Review*, Vol. 71, No. 3, pp.75–86.

Mouime, M. and Benkassmi, M. (2021) 'Information system and national observatory of human development household panel for the evaluation of public policy on human development', *Proceedings from the Second International Conference on National Evaluation Capacities*, UNDP, Morocco.

Moyano-Fuentes, J., Garcia-Buendia, N., Maqueira-Marín, J.M. and Cobo, M.J. (2021) '22 years of lean supply chain management: a science mapping-based bibliometric analysis', *International Journal of Production Research*, Vol. 59, No. 6, pp.1901–1921.

O'Reilly III, C.A. and Tushman, M.L. (2013) 'Organizational ambidexterity: past, present, and future', *Academy of Management Perspectives*, Vol. 27, No. 4, pp.324–338.

Office des Changes (2023) *Monthly Indicators of Foreign Trade*, Kingdom of Morocco, June [online] https://www.oc.gov.ma/fr/actualites/indicateurs-des-echanges-exterieurs-a-fin-juin-2023 (accessed 1 July 2023).

Oh, D.S., Phillips, F., Park, S. and Lee, E. (2016) 'Innovation ecosystems: a critical examination', *Technovation*, Vol. 54, No. C, pp.1–6.

OICA (2022) *Motor Vehicle Production in Africa by Top Producers*, International Organization of Motor Vehicle Manufacturers [online] https://www.oica.net/category/production-statistics/2022-statistics/ (accessed 2 April 2023).

Overholm, H. (2015) 'Collectively created opportunities in emerging ecosystems: the case of solar service ventures', *Technovation*, Vol. 39, No. 40, pp.14–25.

Padri, T. (2017) *The Future of Work in the Automotive Sector – Challenges of (De)Globalization*, ILO, Geneva, April [online] https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_551604/lang--fr/index.html (accessed 21 April 2023).

Patel, P. and Pavitt, K. (1995) *Technological Competencies in the World's Largest Firms: Characteristics, Constraints and Scope for Managerial Choice*, International Institute for Applied Systems Analysis Working Paper, WP-95-66.

Pavlínek, P. (2012) 'The internationalization of corporate R&D and the automotive industry R&D of East-Central Europe', *Economic Geography*, Vol. 88, No. 3, pp.279–310.

Pavlínek, P. and Ženka, J. (2016) 'Value creation and value capture in the automotive industry: empirical evidence from Czechia', *Environment and Planning A*, Vol. 48, No. 5, pp.937–959.

Peltoniemi, M. (2006) 'Preliminary theoretical framework for the study of business ecosystems', *Emergence: Complexity & Organization*, Vol. 8, No. 1, pp.1–6.

Petricevic, O. and Teece, D.J. (2019) 'The structural reshaping of globalization: implications for strategic sectors, profiting from innovation, and the multinational enterprise', *Journal of International Business Studies*, Vol. 50, No. 9, pp.1487–1512.

Porter, M.E., Delgado, M. and Stern, S. (2014) *Defining Clusters of Related Industries*, National Bureau of Economic Research, Working Paper No. w20375 [online] http://www.nber.org/papers/w20375 (accessed 17 December 2022).

Ritala, P. and Hurmelinna-Laukkanen, P. (2009) 'What's in it for me? Creating and appropriating value in innovation-related coopetition', *Technovation*, Vol. 29, No. 12, pp.819–828.

Ritala, P., Sainio, L.M. and Hurmelinna-Laukkanen, P. (2012) 'Constituents of radical innovation – exploring the role of strategic orientations and market uncertainty', *Technovation*, Vol. 32, No. 11, pp.591–599.

Rodríguez Dela Fuente, M. and Lampón, J.F. (2020) 'Regional upgrading within the automobile industry global value chain: the role of domestic firms and institutions', *International Journal of Automotive Technology and Management*, Vol. 40, No. 3, pp.319–340.

Romelaer, P. (2005) 'Chapitre: L'entretien de recherche', in Wacheux, F. and Roussel, P. (Eds.), *Management des ressources humaines: méthodes de recherche en sciences humaines et socials*, pp.101–137, De Boeck, Bruxelles.

Schade, W. (2016) 'Comparison of innovation systems of different transport modes and the need for public intervention', *Transportation Research Procedia*, Vol. 14, No. 1, pp.4105–4112.

Schilke, O., Hu, S. and Helfat, C.E. (2018) 'Quo Vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research', *Academy of Management Annals*, Vol. 12, No. 1, pp.390–439.

Schmitz, H. (2004) *Local Upgrading in Global Chains: Recent Findings*, Institute of Development Studies, Sussex, Vol. 6, pp.2–7.

Schoemaker, P.J., Heaton, S. and Teece, D. (2018) 'Innovation, dynamic capabilities, and leadership', *California Management Review*, Vol. 61, No. 1, pp.15–42.

Scott, W.R. and Davis, G.F. (2016) *Organizations and Organizing: Rational, Natural, and Open Systems Perspectives*, 1st ed., p.464, Routledge, New York.

Strange, R. and Humphrey, J. (2019) 'What lies between market and hierarchy? Insights from internalization theory and global value chain theory', *Journal of International Business Studies*, Vol. 50, pp.1401–1413.

Sturgeon, T., Van Biesebroeck, J. and Gereffi, G. (2008) 'Value chains, networks and clusters: reframing the global automotive industry', *Journal of Economic Geography*, Vol. 8, No. 3, pp.297–321.

Susman, G.I. and Evered, R.D. (1978) 'An assessment of the scientific merits of action research', *Administrative Science Quarterly*, Vol. 23, No. 4, pp.582–603.

Teece, D.J. (2007) 'Explicating dynamic capabilities: the nature and micro foundations of (sustainable) enterprise performance', *Strategic Management Journal*, Vol. 28, No. 13, pp.1319–1350.

Teece, D.J. (2019) 'A capability theory of the firm: an economics and (strategic) management perspective', *New Zealand Economic Papers*, Vol. 53, No. 1, pp.1–43.

Thiétart, R.A. (2014) '*Méthodes de Recherche en Management*, 4ème ed., pp.47–75, Dunod, Paris.

Thomopoulos, N. and Givoni, M. (2015) 'The autonomous car – a blessing or a curse for the future of low carbon mobility? An exploration of likely vs. desirable outcomes', *European Journal of Futures Research*, Vol. 3, No. 1, pp.1–14.

Valkokari, K. (2015) 'Describing network dynamics in three different business nets', *Scandinavian Journal of Management*, Vol. 31, No. 2, pp.219–231.

Van Tulder, R. (2004) 'Peripheral regionalism: the consequences of integrating central and Eastern Europe in the European automobile space', in *Cars, Carriers of Regionalism?*, pp.75–90, Palgrave Macmillan, UK.

Walser-Luchesi, A. and Morel, M. (2001) 'Le Diagramme des Affinités: Un Outil d'Organisation des Données Factuelles', *Décisions Marketing*, Vol. 24, No. 2, pp.75–86.

Notes

1 https://www.albayane.press.ma/renault-maroc-consolide-ses-performances-au-premier-semestre.html (August 1, 2023).

2 https://www.mcinet.gov.ma/fr/content/plan-dacceleration-industrielle-2014-2020 (August 1, 2023).