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Electric Vehicle Business: How Entrepreneurs are Involved in Decision-Making in Business Development and Sustainability

Sonny Indrajaya[1*], Eri Marlapa[2], Ryani Dhyan Parashakti[3]
[1*]*Faculty of Economic and Business, Mercu Buana University, Indonesia.*
sonny.indrajaya@mercubuana.ac.id
[2] *Faculty of Economic and Business, Mercu Buana University, Indonesia.*
eri.marlapa@mercubuana.ac.id
[3]*Faculty of Business and Social Sciences, Dian Nusantara University, Indonesia.*
ryani.dhyan.parashakti@undira.ac.id

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ABSTRACT

Text-based data increasingly poses methodological challenges, requiring methods to manage, visualize, analyze, and interpret it. This paper aims to propose analytics as a possible solution to these challenges, while also demonstrating its potential for innovation, intentionality and decision making in the context of business development and sustainability. This paper uses qualitative methods to describe general application areas (contexts) and presents specific use cases, analysis, findings, and discussions for each application area. Research results that demonstrate pragmatic tools for analyzing and visualizing related business impacts in terms of innovation, intention, decision making, business development, and sustainability. This analysis focuses only on related aspects. Future research could expand on other impacts. The results of this study demonstrate that pragmatic tools for analyzing and visualizing business impacts are expected to provide insights for entrepreneurs, organizations, and governments. This paper contributes to this methodology by providing an overview of qualitative approaches focused on innovation, intention, decision-making, business development, and sustainability.

Keywords: Innovation; Intention; Decision Making; Business Development; Sustainability

1. INTRODUCTION

Entrepreneurship requires action (Wood *et al*., 2021), and the individual who acts is, quite literally, an actor. It is this actor, and the conventional stereotypes associated with an entrepreneur, that are the primary subject of this essay. More specifically, while for decades entrepreneurship research has remained fixated on a rather narrow conceptualization of what a conventional entrepreneur looks like, over the years a growing body of research has examined diverse groups of entrepreneurs of various types. Known collectively as "underdog entrepreneurs" (Baron *et al*., 2018), "missing entrepreneurs" (OECD, 2021), or "non-traditional entrepreneurs", this research has recognized the enormous (and largely untapped) potential of many groups of unconventional entrepreneurs who are passively ignored, often stigmatized, and sometimes actively discouraged from pursuing their entrepreneurial endeavors.

While this line of research has made significant progress in understanding specific groups of unconventional entrepreneurs, we observe a tendency within this research to limit our understanding of each group to that group itself. We attribute the importance and power of contextualization to facilitating a deeper understanding of this phenomenon (Bruton *et al*., 2022). Contextualization has indeed facilitated the formation of knowledge about each group (McMullen *et al*., 2021). Different groups of unconventional entrepreneurs face their own idiosyncratic obstacles, challenges, and opportunities. While we acknowledge these differences, we argue that studying each subgroup independently has contributed to the fragmentation of the field by neglecting the search for a common conceptual foundation that can underpin the various manifestations of unconventional entrepreneurship (McMullen *et al*., 2021).

The main argument we make in this essay is that there are important questions we have not posed or answered, because we have tended to look at distinct subgroups of inclusive or unconventional entrepreneurs independently

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and not to seek shared wisdom across them. Identifying this shared wisdom does not mean that we consider all unconventional entrepreneurial groups identical, or that we argue that the challenges and opportunities they face are equivalent. However, by acknowledging the distinct attributes of each group, we invite researchers to begin exploring possible commonalities as a way to generate shared insights across diverse groups of unconventional entrepreneurs. 1 That is, rather than emphasizing the uniqueness of each setting, at a higher level of abstraction, we can ask: What core assumptions, processes, or theoretical characteristics might be shared by different groups of unconventional entrepreneurs? Are there any "meta-challenges" these groups might face? And: What should be addressed in a general theoretical conversation about unconventional entrepreneurship?

We invite researchers to join in this effort and provide a basic outline of what such a shared conversation might look like. What we are striving for is a theoretical conversation that recognizes that, when it comes to non-conventional entrepreneurship, we are not all singing solo; there are similar notes in the same tune, and discovering and recognizing them will facilitate knowledge transfer, prevent silos and unnecessary re-inventions, increase the field's traction and critical mass, facilitate a broader exchange of ideas, and potentially lay the groundwork for collective action (Bergman *et al.*, 2021). Therefore, we believe that facilitating a broader exchange of ideas around inclusive or non-conventional entrepreneurship is crucial now more than ever.

Entrepreneurship means undertaking and solving complex problems or situations. Entrepreneurship involves decision-making under conditions of high uncertainty, making risk-taking an integral part of entrepreneurial activity (Shepherd *et al.*, 2015). Entrepreneurs must be able to analyze all potential consequences of available options and seek additional information to increase their confidence in their decisions. Consequently, taking risky decisions is not always justified and does not always lead to the best outcomes. Instead, entrepreneurs should opt for rational decision-making, this approach will result in successful entrepreneurial venture management (Melovic *et al.*, 2022).

Due to business practices, decision-making issues related to innovation processes have received little attention. This research opens the door to further scientific investigation and description of the elements of decision-making related to innovation processes. The subject of this article is to highlight the results of a survey on decision-making in the innovation process. This survey will primarily highlight errors in the preparation of information for innovation decision-making, errors in companies' innovative activities related to their interests, and evaluate research questions related to the issues discussed (Holubcík *et al.*, 2024).

Investors typically seek returns by allocating capital to equity or debt investments. Given recent market developments, investors may consider whether their intentions justify revising their investment portfolios. However, in reality, cognitive and emotional factors are considered when evaluating investment alternatives, which can override logical behavior in the decision-making process. The expansion of financial markets has created Intention for individuals to invest in a variety of financial instruments. Thus, the discipline of behavioral finance has advanced our understanding of individual investor behavior by explaining the individual attributes and psychological processes that influence investment intentions and subsequent decisions (Yang *et al.*,2021).

The volatile and interconnected economic environment, shaped by constantly changing geopolitical and regional dynamics, makes selecting an effective business development model crucial for ensuring an organization's sustainable development, long-term growth, scalability, and strategic resilience (Mirzaee *et al.*, 2024). Observe, business development strategies involving digital transformation influence how businesses expand operations, access new markets, and adapt to dynamic technological, regulatory, and sustainability challenges (Mick *et al.*,2024).

Unlike business models focused on value creation and delivery, business development models define the structural path of business growth, including strategies such as cross-border investment, diversification, platform scaling, and market penetration. In contexts characterized by innovation and resource constraints, these models serve as critical levers for strategic differentiation and sustainable performance (Aktaş *et al.*, 2023). Strategic decisions involving growth models require businesses to navigate multiple objectives, including financial viability, operational complexity, adaptability, and risk mitigation, within a dynamic environment (Wang *et al.*, 2021).

In recent years, entrepreneurship has received significant attention, including social, environmental, sustainable, and green entrepreneurship, in academic literature. Entrepreneurs focus on solving problems through

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entrepreneurial activities and innovative business ventures. Entrepreneurship is seen as a driver of economic growth through innovation, job creation, technology, and positive impacts on exports and GDP per capita (Cumming *et al.*, 2014).

In particular, social entrepreneurship has attracted the attention of academics and practitioners due to its potential to contribute to solving pressing social problems and responding to major challenges (Bacq *et al.*, 2020). Social enterprises seek to integrate entrepreneurship with sustainable development, offering potential for implementing the SDGs. Furthermore, social entrepreneurship is defined differently across countries, highlighting differences in the contexts of developed and developing countries (Defourny *et al.*, 2021).

In particular, social entrepreneurship has attracted the attention of academics and practitioners due to its potential to contribute to solving pressing social problems and responding to major challenges. Social enterprises seek to integrate entrepreneurship with sustainable development, offering potential for implementing the SDGs. Furthermore, social entrepreneurship is defined differently across countries, highlighting differences in the contexts of developed and developing countries (Defourny *et al.*, 2021).

The definitions agree that social enterprises combine business activities with social missions to serve vulnerable people (Gigauri, 2022) and help society to transform instead of generating profit for its founders. Searching innovative solutions, social entrepreneurs achieve scaled social impact (Lubberink *et al.*, 2019). Entrepreneurial orientation includes “processes, practices, and decision-making activities, leading to innovations and defining the market potential of a company (Kiyabo *et al.*, 2020). Although sustainable development encompasses social, environmental, and economic aspects to be balanced, the sustainability concept is described as maintaining “critical natural capital intact for transferal to future generations” (Reijnders et al., 2021).

Entrepreneurial collaboration influences sustainability in three ways: first, for cross-actor participation within entrepreneurial processes; second, for coordinating across sustainability issues and between entrepreneurial solutions; and third, for cross-sector cooperation between different forms of entrepreneurship, the collaborative entrepreneurship being linked with sustainable development (Schaltegger *et al.*, 2018). Entrepreneurship has a positive impact on economic growth and, respectively, job creation and social welfare (Doran *et al.*, 2018), the growing interest in environmental issues contributes to the development of environmentally friendly activities, becoming a driving factor for sustainable development (Martín *et al.*, 2021). Entrepreneurship is considered an alternative to unemployment and poverty, a panacea for development. contributing significantly to achieving sustainable growth, and together with small businesses, entrepreneurship is the foundation of the economy (Apostu *et al.*, 2022). Therefore, the purpose of this article is to explore the role of small business owners. Specifically, we investigate how entrepreneurs engage with branding. This objective is guided by the following research questions:

RQ1. How Entrepreneurs are involved in innovation and intention in decision-making in the company?

RQ2. How Entrepreneurs are involved in business development and sustainability in the company?

2. CONCEPTUAL FRAMEWORK

With technological advancements and the Industrial Revolution 4.0, businesses today compete on product, service, and business model innovation. Meanwhile, emerging socio-ecological crises make it increasingly important to identify business impacts on the environment and society. To date, much literature has explored how sustainability can be achieved through internal corporate research and development and supply chain collaboration (Liu and Stephens, 2019).

Based on the business literature, we recognize the crucial role of several factors in the creation, development, and sustainability of businesses. Furthermore, our framework integrates the literature on innovation, intention, decision-making, business development, and sustainability, recognizing the crucial role of each. By examining each, we gain deeper insights into how these identities shape business development and sustainability efforts.

2.1 Entrepreneurs are involved in innovation and intentiona in decision-making in the company

Barriers to new innovations that impact businesses also play a significant role in innovation. The focus is on developing solution proposals that will help companies implement efficient and functional decision-making

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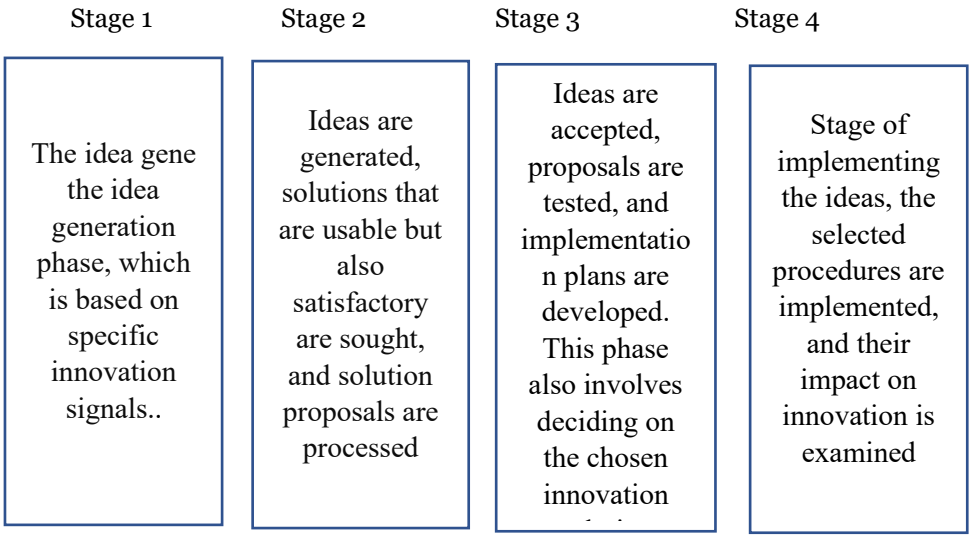
processes in innovation management (Holubcík *et al*,, 2024).). Innovation decision-making is contingent on leveraging the breadth of experience and expertise of all actors involved in the process (Rego and Barreto, 2023). In work focused on decision-making in the innovation process, the most essential component of innovation management is the process view of innovation and its link to decision-making. Companies can be successful in a competitive environment by needing to develop organizational innovation and knowledge as well as innovation capabilities simultaneously, thus increasing their importance (Likar et al., 2023).

The innovation process in the following steps: First is the idea generation phase, which is based on the certain innovation signals. Next, ideas are generated, usable but also marginally satisfactory solutions are sought, and a solution proposal is processed. In the next phase, ideas are accepted, proposals are tested, and an implementation plan is created. A part of this phase is also the decision on the selection of the chosen innovation solution. In the last stage of the implementation of the ideas, selected procedures are applied, and their impact on innovations is checked (Cakir et al., 2023). Thus, innovation can take different forms in a company, and several studies have identified key areas where companies can gain new advantages and develop their innovation capabilities. This enterprise development and the success of innovation activities may be dependent on managerial capabilities, or the suitability of the process implemented (Eriksson and Heikkila, 2023).



Source: Cakir *et al*., 2023.

Figure 1. The innovation process consists of the following steps

The expansion of financial markets has created opportunities for individuals to invest in a variety of financial instruments. Thus, the discipline of behavioral finance has enriched the understanding of individual investor behavior by explaining the individual attributes and psychological processes that influence investment intentions and subsequent decisions (Yang *et al*., 2021). Classical economic theory assumes that individuals act rationally because they aim to maximize their wealth by adhering to basic financial rules and considering all available information when making investment decisions. They typically conduct fundamental analysis, technical analysis, and valuation when conducting investment analysis (Raut *et al*., 2021).

There is also research on investment intentions (Mahdzan *et al*., 2020), to represent behavioral decisions. Behavioral intentions influence behavioral performance. The more dedicated an individual is to engaging in a particular behavior, the more likely they are to follow through. Thus, intentions can be used to predict behavior. Although there are few studies that attempt to systematically review investor behavior issues, identified several biases and proposed solutions to minimize the impact of biases on decision-making (Ballis and Verousis, 2022).

A key argument behind the performance consequences of entrepreneurial orientation (EO) is that it reflects not only the orientation of top management but also the strategic posture of different layers of management that promote individual initiative and distributed entrepreneurship within the firm's decision-making (Bouncken *et al*., 2020).

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Drawing on the dynamic capabilities perspective, it embraces the literature stream that emphasizes the role of internal factors in business model innovation and responds to recent calls for more research on the internal drivers of business model innovation in decision-making (Frankenberger and Sauer, 2019).

BMI business model innovation can be understood, from a dynamic perspective, as a process of reconfiguring one or more interrelated core elements underlying the firm's logic for creating and delivering value, thus representing a dynamic capability that can help firms in decision-making perceive new opportunities and exploit them to maintain or improve firm performance and competitiveness (Ciampi *et al*., 2021).

2.2 Entrepreneurs are involved in business development and sustainability in the company

Despite the crucial role innovation plays in achieving the SDGs and sustaining business growth, current understanding of the relationship between innovation and the SDGs in business remains fragmented and underdeveloped. Numerous studies have emerged in recent years examining both innovation (Haftor and Costa, 2023), and the SDGs (De Ruyter *et al*., 2022), but few have focused on the relationship between the two (Nylund *et al*., 2021). Hence, innovation should take a fundamental role in the company's business strategy because it is regarded as one of the key factors of success and an essential strategic component to survive in an increasingly competitive market environment (Wolf *et al*., 2021).

Now, due to the disruption of digital technologies and the complexity of leading dynamic markets in a sustainable way, the average age of the companies in the S&P 500 has been reduced to less than 20 years, versus the 60 years in the 1960s. So, ensuring that innovation is embedded into a business strategy moves organizations to innovate in the long term, helping them survive beyond the next financial year. Innovation is considered a key factor in the organization's performance (Tohidi and Jabbari, 2021). But what kind of innovation is needed? How is the strategy defined? What actions need to be taken by companies toward innovation? Business innovation needs an innovation strategy that drives companies to decide on the innovation plan that best suits their corporate objectives, regulates their processes, and explains how to use the resources to generate value and competitive advantage through innovation (Singh and Aggarwal, 2021).

This growing interest is not surprising, as several successful businesses, including Google, Reddit, Snapchat, and Facebook, were started by student founders while still in college (Harima *et al*., 2021). Student entrepreneurship has been under scrutiny for years as an important area of research in entrepreneurship, with many researchers focusing on how students can transform into entrepreneurs (Hoang *et al*., 2022). A well-known and widely accepted view is that entrepreneurship is a behavioral outcome that begins when an individual develops an intention to start a business before engaging in actual business activity (Kong *et al*., 2020). Entrepreneurial intention (IE) is defined as "an individual's self-recognized belief that they intend to establish a new business venture and consciously plan to do so in the future". EI is considered a proximal factor closely related to actual behavior because entrepreneurship is an intentional process (Tseng *et al*., 2022). In the context of college student entrepreneurship, studies focusing on the development of EI have received considerable attention and yielded numerous insights (Liu *et al*., 2022). However, a major limitation observed in recent years is that not all students' EI translates into actual behavior, resulting in an EI-behavior gap (Duong, 2023). Therefore, our study addresses two new gaps in the existing literature regarding the EI-KB relationship. First, the existing literature indicates that EI only contributes approximately 30% to the variance in entrepreneurial behavior (Sancho *et al*., 2022).

Sustainability is typically more closely related to an organization's all-encompassing strategy. It considers logistics as well as the entire production process. For instance, a green product made from recycled materials is more likely to be bought. There is no denying the impact of climate change on our planet's priceless but limited resources (Haleem *et al*., 2023). One entrance point to start reforms toward sustainability will be entrepreneurship (Westman *et al*., 2023). A new discipline called "sustainable entrepreneurship" has been developed by combining entrepreneurship and sustainability development (Gupta *et al*., 2023). Promoting economic growth has been seen as a goal of entrepreneurship, while social and environmental issues have been ignored. However, some academics argue that entrepreneurship should not be centered only on generating wealth due to the rising attention that "governments", "non-governmental organizations", "researchers", and "enterprises" are providing to environmental challenges and the creation of the concept of sustainable development (Rosario *et al*., 2022).

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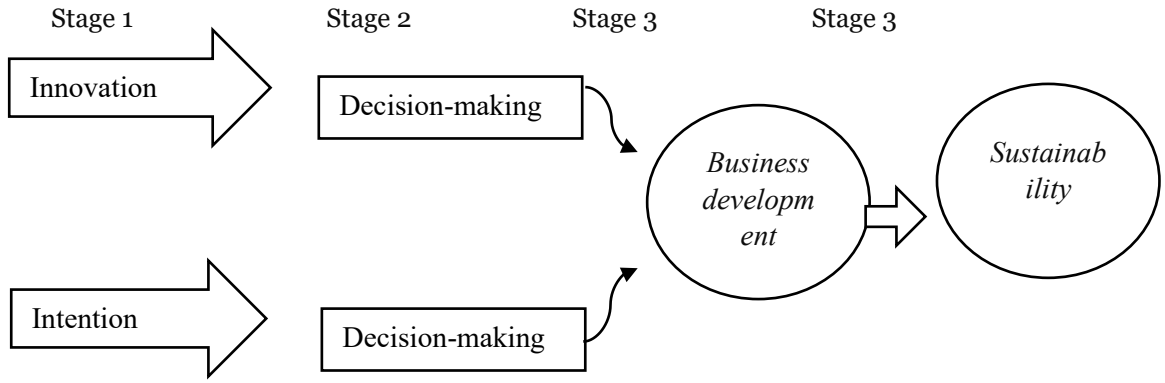
Additionally, some researchers claim that entrepreneurship is a tool that may guide many sectors of the economy toward environmental sustainability. This sustainable entrepreneurship claims sustainable development is the cornerstone for creating sustainable company models because entrepreneurs can recognize long-term entrepreneurial potential. Sustainable entrepreneurship is "the investigation of how possibilities to bring prospective products and services into presence are unearthed, formed, taken advantage of, by whom, and with what economic, psychological, cultural (Di Vaio et al., 2022).



Source: Author own work

Figure 2. Conceptual Framework Development

3. METHODOLOGY

To explore our topic, how small business brands evolve over time, we employed a qualitative approach through a multi-longitudinal case study (Stake, 2006). Qualitative case studies allow for in-depth exploration of complex phenomena, offering insights into how they develop and how people construct meaning (Flyvbjerg, 2006). Given our focus on understanding business development, a qualitative approach was deemed appropriate.

3.1 Selecting and collecting the empirical material

This article examines how two countries (Germany and China), all among the top motor vehicle manufacturers, are managing the transition from traditional fossil-fuel-driven transport systems to e-mobility. These two countries embarked on ambitious national e-mobility development programs and established coordinating bodies between 2008 and 2011. At the same time, they had very different starting conditions regarding the structure and competitiveness of their existing motor vehicle industries; power relations between industrialists and environmentalists also differed, as did patterns of economic governance. These variations present interesting cases for comparison (Altenburg et al. 2012).

Germany: from high-emission luxury cars to competitive advantages in electric vehicles? Germany is the fourt largest car manufacturer worldwide and by far the largest in Europe (OICA, 2010). The automotive industry is Germany's most important, with sales reaching E315 billion in 2010 (BMWI, 2010), contributing 20% of total German industry revenue in 2009 and providing employment for 723,000 persons (GTAI, 2010). The German car industry, with brands including Daimler-Chrysler, BMW, Audi and Porsche, has a strong competitive edge in upper middle-sized and luxury class vehicles. Average emissions per vehicle are therefore high, which is why Germany – otherwise a frontrunner in environmental policies – successfully lobbied against more ambitious CO2 emission reduction targets at EU level.5 Given its current pattern of specialisation within the global motor vehicle industry, escaping a carbon lock-in (Cowan and Hulte´n, 1996) could prove even more difficult for Germany.

However, the German car industry has taken up the challenge of e-mobility. The EU's graduated scheme for emissions reduction does not leave any alternative. German carmakers need to reduce emissions per vehicle across all size categories of cars and at the same time develop a substantial number of low emission cars to compensate for the traditional luxury cars in their portfolio that are unlikely to reach the prescribed limits. BMW and Opel will launch mass-manufactured battery-electric vehicles in 2013, two years behind France and about four years behind Japan.

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Despite this time lag, the industry is optimistic that it can catch up with the frontrunners, as Germany's sectoral innovation system for the automotive industry is particularly strong. Germany was not only the European leader in the number of electric and hybrid vehicle patents filed in 2003 – 2008, but it also had the second-highest share of this sector in national patents overall, topped only by Japan (OECD, 2011b). With E20 billion in 2010, the automobile industry is by far the largest contributor to Germany's private R&D expenditure (VDA, 2011). Germany hosts 42% of all European Original Equipment Manufacturer and tier 0.5 supplier automotive R&D centres (Invest in Germany, 2008). Furthermore, large energy utilities including E.ON and RWE show strong commitment to developing e-mobility and have entered a number of strategic alliances with carmakers to experiment with electric vehicle fleets and local charging networks.

Germany has competitive advantages in most industries that feed into the automotive value chain. However, a SWOT analysis conducted in preparation for the National Electromobility Development Plan identified battery technology as the Achilles heel of the German innovation system for electric vehicles (Bundesregierung, 2009). Lithium-ion battery technologies have mainly been developed in Japan and Korea in conjunction with the electronics and optical industries. When these industries gradually relocated to Asia in the 1980s and 1990s, Germany's interest in battery technology diminished and relatively more research was dedicated to hydrogen and fuel cell technology development (Interview with Dr. Randolf Schliebr, 2011)

China: industry change as a leapfrogging opportunity?

In 2009, China surpassed Japan as the world's largest producer of motor vehicles, and in 2010, production surpassed 18 million vehicles (OICA, 2010). China is now also the largest automotive market. The rapid growth of China's automotive industry began in the 1990s, when the government designated the industry as a pillar of China's economic development and, for the first time since 1949, permitted private car ownership. The industry developed through joint ventures between Chinese state-owned enterprises and large foreign companies, as a way to accelerate technology transfer. In recent years, several large Chinese-owned companies have emerged, most of them state-owned enterprises supported by local governments, with the exception of privately held Geely. The innovative approach of Chinese-owned companies, characterized by simplified production processes and lower production costs, has challenged joint ventures and foreign car brands in the Chinese market. Although the government's long-term strategy is to develop local brands for export, exports have so far remained low. Chinese automakers have not achieved the desired competitiveness in the global market. They still struggle to meet the safety and quality standards of industrialized countries and continue to rely on foreign technology (e.g., drive systems) (Gao et al., 2008; Zhang, 2011).

Against this backdrop, Chinese politicians and industry experts have identified the shift to e-mobility as an opportunity for a technological leap (Wang and Kimble, 2011). The initial conditions for this shift appear favorable: China is already a major global market for battery technology, particularly lithium-ion batteries used in the electronics industry, and is expected to contribute significantly to lowering battery costs as the industry scales up for mass production of large batteries for electric vehicle applications (World Bank, PRTM Management Consultants, 2011). Furthermore, China has the world's largest e-bike market, supplied by Chinese companies largely based on domestic technology. This has also familiarized Chinese consumers with the idea of e-mobility.

3.2 Analysing the material and reporting the findings

Germany: from high-emission luxury cars to competitive advantages in electric vehicles. A coordinated policy approach for electric vehicles started in 2008 when an inter-ministerial committee was formed and the decision was taken to establish the National Platform Electromobility with the mandate to coordinate a systemic, market-oriented and technology-neutral approach to make Germany a leading provider and lead market for 'electromobility made in Germany' (NPE, 2011). By the end of 2011, the platform had 147 members, including enterprises from different industries, state agencies and civil society organisation, ranging from the national automobile club to environmental NGOs. To ensure day-to-day coordination, a Federal Government Joint Unit for Electric Mobility was created, with personnel seconded from four ministries. Seven thematic working groups were established within the unit to deal with issues such as 'drive technology and systems integration', 'charging infrastructure and grid integration', 'battery technology' and 'norms and standards'. While these working groups involve a broad range of stakeholders, their

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agenda is in most cases very much industry-led. At the same time, the broad range of stakeholders helps to avoid political capture, because members pursue different interests, and it would be difficult for one particular industry to impose its interests (Interview with Ingrid Ott, 2011).

The programmes for R&D and deployment in the different fields of technology under the umbrella of the National Platform Electromobility amount to E4 billion (NPE, 2011). As in France, research funding benefited from the German governments' second stimulus package to overcome the deep recession in late 2008, early 2009. The national strategy has set the objective of having 1 million electric vehicles circulating on German roads by 2020 and a minimum of 6 million by 2030 (Bundesregierung, 2011).

German strategy also supports regional experiments, typically executed by alliances between energy utilities, carmakers and municipalities. Starting with a tender in late 2011, three to five of these regional pilots will be up-scaled to so-called 'Schaufenster' (showcases) for large-scale experimentation. E180 million have been earmarked for such showcases.

As in France, the main motives behind Germany's national e-mobility strategy are emissions reduction and competitive repositioning of the national automotive industry. A major difference, however, relates to the interface between electric vehicles and the energy system. While France's energy policy regards nuclear energy as an appropriate source of low carbon energy, Germany is phasing its nuclear energy programme out. In Germany, fossil fuels account for the lion's share of electricity generation. Promoting e-mobility on the basis of this energy mix would hardly have any positive effect on greenhouse gas emissions. Therefore, the 'Government Programme Electromobility' states that 'additional demand for electric energy for this sector is to be covered by renewable energies' (Bundesregierung, 2011). The Ministry of Environment even claims that renewable energy used for the purpose of electric vehicles should be on top of the already committed national renewable energy targets. Hence, electromobility development in Germany is contingent upon energy system reforms. This is reflected in a strong research focus on ways of integrating electric vehicles into intelligent power supply systems that provide for using the vehicle fleet for intermediate energy storage and feeding energy back into the grid when supply is low, thereby mitigating the typical fluctuations of solar and wind energy supply.

The German approach relies more on market-based experimentation, private sector-led initiatives, allocating the bulk of its subsidies to research and demonstration projects. There are neither direct subsidies for purchasing electric vehicles in Germany nor concerted public-private procurement initiatives, in contrast to France. The National Platform Electromobility explicitly states that Innovation and Development it is preferable to support R&D than to subsidise the cost of vehicles. This reflects a generally less interventionist position of German governments and of the current Christian-liberal coalition in particular, but it may also be due to more pragmatic reasons: as long as German carmakers have no electric vehicles on offer, a purchase subsidy would use German taxpayers' money to buy almost exclusively French and Japanese cars.

The German government is also avoiding getting deeply involved in infrastructure development. While France uses an integrated package of state funding, mandatory requirements for companies and nudging of municipalities to build up a dense country-wide charging infrastructure, the German government trusts in demonstration effects from the regional showcases and a mainly voluntary and market-driven process of infrastructure expansion. Also, Germany's federal political system favours competing regional experiments, whereas France's highly centralised political system allows the government to implement one nation-wide infrastructure initiative.

China: industry change as a leapfrogging opportunity. Policy support for electric vehicles originates from three sources (Wu, 2010). First, technological development and innovation has received support from government research funds since the 10th Five-Year Plan (2001 – 2006). The 12th FYP (2011 – 2015) has included electric vehicles in the list of priority emerging industries, encouraging R&D accordingly. Also, specific development goals have been defined in the science and technology policies of the Ministry of Science and Technology (MOST, 2011). Second, the government selected 13 cities to experiment with 'energy efficient and new energy automobiles' in 2009. The number of cities has since been increased to 25. While these cities are supposed to experiment with public vehicle fleets, five more cities were selected in 2010 to experiment with purchase subsidies for private electric vehicles. Third, in July 2010 the Ministry of Industry and Information Technology (MIIT) circulated a Draft development plan for the energy

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efficient and new energy car industry (2011 – 2020)' for comment from other ministries and dissemination by the State Council. Even as draft, this document currently serves as major guideline for the industry.

Both central and local governments define ambitious projections for e-vehicle production and diffusion. The MIIT draft development plan describes a preparatory period until 2012 for the development of relevant standards, construction of recharging infrastructure and local experiments. A modest degree of mass production and commercialisation is expected to develop until 2015. Until then, 'indigenous' know-how in the technology of core parts (such as battery, electric motor and electric control systems) shall be available in China. The envisaged market volume for 2012 is a minimum of 500,000 battery-electric and plug-in hybrid electric vehicles. Mass production at the highest international technology level shall be achieved by 2020, allowing for production and sales capacities for five million vehicles. The draft plan includes objectives for industry structure; by 2020 there should be a small number of large enterprise groups dominating the different steps of the electric vehicle value chain, namely vehicle, battery, raw materials as well as motor and automatic gearing production (Wu, 2010).

To overcome coordination failure, central government support includes supply and demand side incentives, including subsidies for private purchases of new energy vehicles, tax holidays, reduction of VAT, demonstration projects and incentives for corporate R&D (Liu, 2010). In addition, appropriate energy efficient and new energy cars will be integrated in government procurement priority lists for environment-friendly and indigenous innovation products. Some of the policies suggested in the draft document have since been implemented or specified at the local level. For example, at least six cities (Shanghai, Changchun, Shenzhen, Hangzhou, Hefei and Beijing) already apply the subsidy scheme for private electric vehicle purchases. In these cases, the central government provides up to E66009 purchasing subsidy for battery-electric and E5500 for plug-in hybrid electric vehicles. Local governments are allowed to add a purchasing subsidy of up to E6600. In addition, some local governments have announced highly ambitious policies that envisage production capacities for new energy vehicles in 2015 that go far beyond the national targets formulated in the draft industrial policy.

Apart from local governments, enterprises also reacted to the policies of 2010. Three major alliances were formed. First, the 'China Electric Vehicle Alliance' links 16 large state-owned enterprises under the guidance of the State-owned Asset Supervision and Administration Commission (SASAC) with the intention of establishing a national platform for electric vehicle technology. Second, the 'Top 10 Electric Vehicle Alliance' unites 10 carmakers based on an initiative of the China's Automobile Industry Association. In addition, some Chinese and US firms created the Sustainable New Energies International Alliance. These alliances were allegedly created to foster cooperation along the electric vehicle value chain. However, the enterprises also hope to get better access to financial support through the alliances, as the government policies promise overall financial support in the range of E11 billion. SASAC additionally promised to invest E140 million in the China Electric Vehicle Alliance. Given the size and status of the stateowned enterprises joining this alliance, one additional hope was to define future electric vehicle standards.

Electric vehicle sector development has thus received substantial government support in recent years. The government hopes that electric vehicles will help push the Chinese automobile industry from being a production hub to becoming a centre of cutting-edge innovation. The thriving e-bike industry is not an integral part of the e-mobility strategies described above. This has been criticised in China by researchers who see a stronger potential for China to develop indigenous e-mobility technology from upgrading e-bike know-how. However, the e-bike industry is driven by private small and medium enterprises and, as such, is far less important for the economy than the large state-owned automobile producers.

Other considerations support the electric vehicle strategy. First, e-mobility is expected to reduce China's dependence on oil imports, while the country's endowment with some rare earths which are strategic for electric vehicles adds a geopolitical advantage. Second, e-mobility is seen as a way to reduce urban air pollution. Climate change considerations so far play a minor role in e-mobility policies, as electricity comes mainly from coal-fired power plants and e-mobility thus does not reduce overall emissions.

In sum, the recent national electric vehicle initiatives show typical traits of Chinese industrial policies in that they favour large and state-owned enterprises, formulate technological and structural goals, and emphasise the importance of indigenous innovation in order to lessen the dependence on imported technologies. The policies are

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initiated top-down but intentionally pick specific regions as testing grounds and encourage them to come up with more specific or additional initiatives. This approach of 'competition under hierarchy' (Fischer, 2010; Heilmann, 2011) has shown strengths and weaknesses in the past. Often production targets are reached much earlier than expected due to a 'run' into the industry triggered by the policies and local initiatives. Fierce competition then leads to rapidly decreasing prices. While Chinese enterprises often have thrived in this competition due to cost advantages arising from economies of scale, process management, etc., the approach has so far hardly ever produced technological leadership. It therefore must be doubted that China's current policies will support big gains in innovation capacities of China's automobile industry. However, China will probably make major contributions in cost reduction of the battery system and other components.

4. FINDINGS

This section describes the themes identified in our study, which revolve around business development potential. These themes are then correlated with the functions of developing that potential, including providing recognition, differentiation, and adding value to stakeholders. The theoretical underpinnings of these themes are detailed in full in the Selection and Collection of Empirical Materials for business, which describes the systematic sections and the relationship of our empirical data to relevant theoretical themes.

4.1 Entrepreneurs are involved in innovation and intention in decision-making in the company

This research shows that German and Chinese entrepreneurs respond to challenges with innovation and attention to decision-making. We understand this process as company development. For example, in the case of electric vehicles in Germany and China, the founding entrepreneurs not only run their companies but also address the challenges. German entrepreneurs, for example, mirror the dedication of German automotive entrepreneurs to the challenges of electric vehicles. Despite this time lag, the industry is optimistic about catching up, as Germany's sectoral innovation system for the automotive industry is very strong. Germany not only led Europe in the number of patents filed for electric and hybrid vehicles between 2003 and 2008, but also had the second-highest share of this sector in total national patents, surpassed only by Japan (OECD, 2011b). With €20 billion in 2010, the automotive industry is by far the largest contributor to German private R&D expenditure (VDA, 2011). Germany has 42% of all Original Equipment Manufacturer (OEM) automotive R&D centers and tier 0.5 suppliers in Europe (Invest in Germany, 2008). Furthermore, major energy utilities, including E.ON and RWE, have demonstrated a strong commitment to developing e-mobility and have forged several strategic alliances with automakers to experiment with electric vehicle fleets and local charging networks.

Similarly, Chinese entrepreneurs embody entrepreneurial values, including a commitment to addressing the challenges of electric vehicles. Thanks to their attention and innovation, China surpassed Japan as the world's largest motor vehicle producer, and in 2010, production surpassed 18 million vehicles (OICA, 2010). China has also now become the largest automotive market. The rapid growth of China's automotive industry began in the 1990s, when the government designated the industry as a pillar of China's economic development and, for the first time since 1949, permitted private car ownership. The industry developed through joint ventures between Chinese state-owned enterprises and large foreign companies, as a way to accelerate technology transfer. In recent years, several large Chinese-owned companies have emerged, most of which are state-owned enterprises supported by local governments, with the exception of Geely, which is a private company. The meticulous and innovative approach of Chinese-owned companies, characterized by simplified production processes and lower production costs, has challenged joint ventures and foreign car brands in the Chinese market. Despite the government's long-term strategy to develop local brands for export, exports have so far remained low. Chinese car manufacturers have not achieved the desired competitiveness in the global market. They still struggle to meet the safety and quality standards of industrialized nations and continue to rely on foreign technology.

The integration of German and Chinese entrepreneurs for innovation and attention to decision-making is in line with research, supported by other studies such as Holubcík et al., 2024; Cakir et al., 2023; Eriksson and Heikkila, 2023; Bouncken et al., 2020; Ciampi et al., 2021).

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4,2 Entrepreneurs are involved in business development and sustainability

The German approach relies more on market-based experimentation and private-sector-led initiatives, allocating the majority of its subsidies to research and demonstration projects. There are no direct subsidies for electric vehicle purchases in Germany, nor is there an integrated public-private procurement initiative, unlike in France. The National Platform for Electromobility explicitly states that, within the Innovation and Development framework, it is preferable to support R&D rather than subsidize vehicle costs. This will support business development and company sustainability.

The central government of China and local governments in China, have set ambitious projections for the production and diffusion of electric vehicles. The MIIT's draft development plan outlines a preparatory period until 2012 for the development of relevant standards, the construction of charging infrastructure, and local experimentation. Mass production and moderate commercialization are expected to continue until 2015. By then, local know-how in core component technologies (such as batteries, electric motors, and electrical control systems) will be available in China. The projected market volume for 2012 is at least 500,000 battery-powered electric vehicles and plug-in hybrids. Mass production at the highest international technological level will be achieved by 2020, enabling a production and sales capacity of five million vehicles. The draft plan includes targets for the industrial structure; by 2020, a small number of large corporate groups are expected to dominate various stages of the electric vehicle value chain: vehicle production, batteries, raw materials, and motors and automatic transmissions (Wu, 2010). This will also support business development and corporate sustainability. This is in line with recent literature such as Liu et al., 2022, Sancho et al., 2022, Haleem et al., 2023, Gupta et al., 2023, Rosario et al., 2022, Di Vaio et al., 2022

5. DISCUSSION

In this section, we engage in a comprehensive discussion of our research findings and their implications for understanding the dynamics of electric vehicle companies in Germany and China. The close relationship between entrepreneurs, companies, and governments in electric vehicle development is a fascinating topic. Our findings highlight the integral role of entrepreneurs, companies, and governments in electric vehicle development, demonstrating their cohesion, with direct involvement in R&D, funding, the value chain, supply chain, production, and sales of electric vehicles (Wu, 2010; Bundesregierung, 2011; NPE, 2011; Liu, 2010; Fischer, 2010; Heilmann, 2011).

The German approach relies more on market-based experimentation and private sector-led initiatives, allocating a significant portion of its subsidies to research and demonstration projects. The National Platform for Electromobility explicitly states that supporting R&D is preferable to subsidizing vehicle costs. This will support both business development and sustainability. Mass production and moderate commercialization in China are expected to continue through 2015. The projected market volume for 2012 is at least 500,000 battery-powered electric vehicles and plug-in hybrids. Mass production at the highest international technological level will be achieved by 2020, enabling a production and sales capacity of five million vehicles. The draft plan includes support for business development and sustainability (Wu, 2010).

Consumer perceptions and behavioral factors play a crucial role in electric vehicle adoption. In particular, greater understanding and awareness of electric vehicles can significantly increase consumer willingness to adopt them, especially in developing countries, where familiarity with the technology may be lower (Mathew and Varaprasad, 2020). Consumption attitudes also significantly influence consumer intentions, both directly and indirectly, through perceived behavioral control (Stockkamp *et al.*, 2021). Governments around the world are implementing various initiatives, such as tax breaks, subsidies, grants, and other non-financial benefits like reduced car registration fees and access to carpool lanes, all of which are expected to encourage business development and sustainability. Electric vehicle sales in the coming years. For example, in November 2019, German car manufacturers increased their cash incentives for electric cars (EVs) to support the transition from combustion engines to battery-powered engines, aiming to reduce harmful emissions (Rogers and Bloomberg, 2019). China has seen significant growth in EV sales over the past decade, which is expected to continue contributing to market growth (Khaleel *et al.*, 2024). Chinese manufacturers, including CATL and BYD, have expanded their global market share, thanks to massive government investment and supportive regulations (Precedence Research, 2025).

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6. LIMITATIONS AND FUTURE RESEARCH

Understanding the limitations of this study opens up opportunities for future research. First, it focused exclusively on electric vehicle businesses and entrepreneurs in Germany and China. Future research should consider including other countries. Second, while this study suggests several areas for research, this selection may not fully capture the flexibility and potential applicability of this method across different domains or contexts. We encourage future research to further explore broader areas, support researchers in uncovering additional insights, and demonstrate a wider range of methods' applications and effectiveness. Third, while this qualitative approach is promising, further empirical research and methodological experimentation would be beneficial in identifying optimal applications across different research contexts.

A general limitation of this study is its use of only qualitative methods, and it is worth considering the use of other methods for more thorough textual reading and understanding, and to address its challenges in capturing the full context of word relationships and minimizing its inability to independently interpret linguistic ambiguities. Future research could use this method, for example, to investigate other experiences and phenomena, such as how the integration of reality in retail environments influences consumer decision-making processes. or to investigate how consumers narrate their physical consumption practices in relation to particular discourses or lifestyles, such as sustainable fashion. In general, we hope that others will join this effort in the future by identifying and elaborating further.

REFERENCES

1. Ahmad, S., Zhang, Q., Hussain, M.A. and Mahmood, S. (2025). Entrepreneurial success through learning, capital, and work engagement: Market and service orientation perspective. Acta Psychologica, 258, 105188. https://doi.org/10.1016/j.actpsy.2025.105188
2. Aktaş, N. and Demirel, N. (2023). A hybrid framework for evaluating corporate sustainability using multi-criteria decision making. Environ. Dev. Sustain, 23, 15591–15618. https://doi.org/10.1007/s10668-021-01311-5
3. Tilman Altenburg, Shikha Bhasin & Doris Fischer (2012): Sustainability-oriented innovation in the automobile industry: advancing electromobility in China, France, Germany and India. *Innovation and Development, 2*(1), 67-85. http://dx.doi.org/10.1080/2157930X.2012.664036
4. Apostu, S.A., Mukli, L., Panait, M., Iza Gigauri, I. and Eglantina Hysa, E. (2022). Economic Growth through the Lenses of Education, Entrepreneurship, and Innovation. *Administrative Sciences, 12*(3), 1-14. https://doi.org/10.3390/admsci12030074
5. Bacq, S., Geoghegan, W., Josefy, M., Stevenson, R., & Williams, T.A. (2020). The COVID-19 virtual idea blitz: Marshaling social entrepreneurship to rapidly respond to urgent grand challenges. *Business Horizons, 63*(6), 705-723. https://doi.org/10.1016/j.bushor.2020.05.002
6. Baron, R.A., Tang, J., Tang, Z. and Zhang, Y. (2018). Bribes as entrepreneurial actions: why underdog entrepreneurs feel compelled to use them. *Journal of Business Venturing, 33* (6), 679-690. https://doi.org/10.1016/j.jbusvent.2018.04.011.
7. Ballis, A. and Verousis, T. (2022). Behavioural Finance and Cryptocurrencies. *Review of Behavioral Finance, 14* (4): 545–562. https://doi.org/10.1108/RBF-11-2021-0256
8. Bouncken, R., Cesinger, B. and Tiberius, V (2020). Narcissism, Machiavellianism, and psychopathy of top managers: can Entrepreneurial Orientation secure performance? Int. J. Entrepreneurial Ventur., 12 (3), 273-302. https://doi.org/10.1504/IJEV.2020.107932
9. Bruton, G.D., Zahra, S.A., Van de Ven, A.H. and Hitt, M.A. (2022). Indigenous theory uses, abuses, and future. *J. Manag. Stud., 59* (4), 1057-1073. https://doi.org/10.1111/joms.12755.
10. Bergman, B.J. and McMullen, J.S. (2021). Helping entrepreneurs help themselves: a review and relational research agenda on entrepreneurial support organizations. *Entrepreneurship: Theory and Practice, 46* (3), 688-728.

https://doi.org/10.1177/10422587211028736
11. Bundesregierung (2009). *German federal government's national electromobility development plan*. Berlin.
12. Bundesregierung (2011) *Regierungsprogramm Elektromobilitat*. Berlin.
13. Cakir, F.S., Kalaycioglu, O. and Adiguzel, Z. (2023). Examination the effects of organizational innovation and knowledge management strategy in information technology companies in R&D departments on service quality and product innovation. *Information Technology & People, 37* (4): 1540–1559.
https://doi.org/10.1108/ITP-03-2022-0196
14. Camuffo, A., Gambardella, A., Messinese, D., Novelli, E., Paolucci, E, and Spina, C. (2024). A scientific approach to entrepreneurial decision-making: Large-scale replication and extension. *Pharma strategies for stability, 45*,1209–1237.
https://doi.org/10.1002/smj.3580

15. Ciampi, F., Demi, S., Magrini, A., G. Marzi, G. and A. Papa, A. (2021). Exploring the impact of big data analytics capabilities on business model innovation: the mediating role of entrepreneurial orientation. Journal of Business Research, 123, 1-13, https://doi.org/10.1016/j.jbusres.2020.09.023
16. Cowan, R., and Hulte´n, S. (1996) Escaping lock-in: The case of the electric vehicle. *Technology Forecasting and Social Change, 53*(1), 61–80.
https://doi.org/10.1016/0040-1625(96)00059-5
17. Covin, J.G., Rigtering, J.P.C., Hughes, M., Kraus, S., Cheng, CF. and R.B. Bouncken, R.B. (2020). Individual and team entrepreneurial orientation: scale development and configurations for success. *Journal of Business Research, 112*, 1-12,
https://doi.org/10.1016/j.jbusres.2020.02.023
18. Cumming, D., Johan, S., & Zhang, M. (2014). The economic impact of entrepreneurship: Comparing international datasets. *Corporate Governance: An International Review, 22*(2), 162-178. https://doi.org/10.1111/corg.12058
19. De Ruyter, K., Keeling, D.I., Plangger, K., Montecchi, M., Scott, M.L. and Dahl. D.W. (2022). Reimagining marketing strategy: Driving the debate on grand challenges. Journal of the Academy of Marketing Science, 50 (1) (2022), 13-21.
https://doi.org/10.1007/s11747-021-00806-x
20. Defourny, J., Mihály, M., Nyssens, M., & Adam, S. (2021). Introduction: Documenting, theorising, mapping and testing the plurality of SE models in Central and Eastern Europe. In J. Defourny, & M. Nyssens (Eds.), *Social Enterprise in Central and Eastern Europe*, 1-19. New York: Routledge.
https://doi.org/10.4324/9780429324529
21. Di Vaio A., Hassan R., Chhabra M., Arrigo E., Palladino R. (2022). Sustainable entrepreneurship impact and entrepreneurial venture life cycle: A systematic literature review. Journal of Cleaner Production, 378, 134469.
https://doi.org/10.1016/j.jclepro.2022.134469
22. Doran, J., Nóirín McCarthy, N. and O'Connor, M. (2018). The role of entrepreneurship in stimulating economic growth in developed and developing countries. *Cogent Economics & Finance, Taylor & Francis Journals, 6*(1), pages 1442093-144, January.
https://doi.org/10.1080/23322039.2018.1442093
23. Duong, C.D. (2023). A moderated mediation model of perceived barriers, entrepreneurial self-efficacy, intentions, and behaviors: A social cognitive career theory perspective. *Oeconomia Copernicana, 14* (1), 355-388.
https://doi.org/10.24136/oc.2023.010
24. Eriksson, T. and Heikkila, M. (2023). Capabilities for data-driven innovation in B2B industrial companies. *Industrial Marketing Management, 111*, 158–172. https://doi.org/10.1016/j.indmarman.2023.04.005
25. Fischer, D. (2010) Comparing transitions: Insights from the economic transition processes in former socialist countries for sustainability transitions. *Osteuropa-Wirtschaft, 55*(4), pp. 289–310.
26. Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12* (2), 219-245.
https://doi.org/10.1177/1077800405284363

27. Frankenberger, K. and R. Sauer, R. (2019). Cognitive antecedents of business models: exploring the link between attention and business model design over time. *Long Range Planning, 52*(3), 283-304.
https://doi.org/10.1016/j.lrp.2018.05.001
28. Gao, P., Wang, A., and Wu, A. (2008). *China charges up: The electric vehicle opportunity*. McKinsey Company, October.
29. GTAI, (2010). GTAI Promotes Germany as a Business Location Abroad. *Germany Trade & Invest*.
30. Gupta B.B., Gaurav A., Panigrahi P.K., Arya V. (2023). Analysis of artificial intelligence-based technologies and approaches on sustainable entrepreneurship. Technological Forecasting and Social Change, 186(B), 122152.
https://doi.org/10.1016/j.techfore.2022.122152
31. Gigauri, I., Panait, M., Apostu, S.A., Raimi, L. (2022). The essence of social entrepreneurship through a Georgian lens: Social entrepreneurs' perspectives. *Administrative Sciences, 12*(3), 75. https://doi.org/10.3390/admsci12030075
32. Haftor, D.M. and Costa, R.C. (2023). Five dimensions of business model innovation: A multi-case exploration of industrial incumbent firm's business model transformations. Journal of Business Research, 154, 113352.
https://doi.org/10.1016/j.jbusres.2022.113352
33. Haleem A., Javaid M., Singh R.P., Suman R., Qadri M.A. (2023). A pervasive study on green manufacturing towards attaining sustainability. Green Technologies and Sustainability, 1(2), 100018
https://doi.org/10.1016/j.grets.2023.100018
34. Harima, A., Gießelmann, J., Göttsch, V. and Schlichting, L. (2021). Entrepreneurship? Let us do it later: Procrastination in the intention-behavior gap of student entrepreneurship. *International Journal of Entrepreneurial Behavior & Research, 27* (5), 1189-1213.
https://doi.org/10.1108/IJEBR-09-2020-0665
35. Heilmann, S. (2011) Policy-making through experimentation: The formation of a distinctive policy process, in: S. Heilmann and E.J. Perry (Hrsg.) (eds) Mao's Invisible Hand – *The political foundations of adaptive governance in China* (Cambridge and London: Harvard University Asia Center), 62–101.
36. Hoang, G., Luu, T.T., Le, T.T.T. and Tran, A,KT. (2022). Dark Triad traits affecting entrepreneurial intentions: The roles of opportunity recognition and locus of control
Journal of Business Venturing Insights, 17, 1-12.
https://doi.org/10.1016/j.jbvi.2022.e00310
37. Holubcík, M. Soviar, J., Lendel, V. and Cernanský, J. (2024). Managerial Decision-Making Methodology to Support Innovation Activities: Evidence from Slovak Enterprises. Systems 2024, 12, 144.
https:// doi.org/10.3390/systems12050144
38. Interview with Dr. Randolf Schliebr, VDI/VDE, Berlin, 9 November, 2011.
39. Interview with Ingrid Ott, Federal Government Joint Unit for Electric Mobility, Berlin, 9th November, 2011.
40. Khaleel, M., Nassar, Y., El-Khozondar, H.J., Elmnifi, M., Rajab, Z., Yaghoubi, E. and Yaghoubi. (2024). E. Electric vehicles in China, Europe, and the United States: Current trend and market comparison. *Int. J. Electr. Eng. Sustain. Dev*, *2* (1).
https://ijees.org/index.php/ijees/article/view/70
41. Khan,S.U.; Khan, I.I.U.; Khan, I.I.U.; Din, S.U.; Khan, A.U. (2020). Evaluating Sukuk Investment Intentions in Pakistan from a Social Cognitive Perspective. *ISRA International Journal of Islamic Finance (2020) 12* (3): 347–365.
https://doi.org/10.1108/IJIF-12-2019-0194
42. Kiyabo, K. & Isaga, N. (2020). Entrepreneurial orientation, competitive advantage, and SMEs' performance: application of firm growth and personal wealth measures. *Journal of Innovation and Entrepreneurship, 9*(12).
https://doi.org/10.1186/s13731-020-00123-7
43. Kong, F., Zhao, L. and Tsai, C.H. (2020).The relationship between entrepreneurial intention and action: The effects of fear of failure and role model. *Frontiers in Psychology, 11* (2020), 1-9.
https://doi.org/10.3389/fpsyg.2020.00229
44. Likar, B., Hafner, A., Ropret, M., Fatur, P., Markic, M. and Pusavec, F. (2023). Smart innovation management for better business performance. *J. East Eur. Manag. Stud, 28,* 533–556. https://doi.org/10.5771/0949-6181-2023-3-533

45. Liu, M., Gorgievski, M.J., Qi, J. and Paas, F. (2022). Perceived university support and entrepreneurial intentions: Do different students benefit differently? *Studies In Educational Evaluation, 73*, 1-9.
https://doi.org/10.1016/j.stueduc.2022.101150
46. Liu, Z. and Stephens, V. (2019). Exploring Innovation Ecosystem from the Perspective of Sustainability: Towards a Conceptual Framework. *Journal of Open Innovation: Technology, Market, and Complexity, 5* (3), 48.
https://doi.org/10.3390/joitmc5030048
47. Liu, W. (2010) Exposing the new energy plan: More than half of central financial support goes to private cars (Xin nengyuan guihua baoguang, guoban zhongyang zhuanxiang zijin butie sijia che).
http://auto.163.com
48. Lubberink, R., Blok, V., Van Ophem, J., & Omta, O. (2019). Responsible innovation by social entrepreneurs: An exploratory study of values integration in innovations. *Journal of Responsible Innovation, 6*(2), 179-210.
https://doi.org/10.1080/23299460.2019.1572374
49. Mahdzan, N.S., Zainudin, R. and Yoong, S.C. (2020). Investment Literacy, Risk Tolerance and Mutual Fund Investments: An Exploratory Study of Working Adults in Kuala Lumpur. *International Journal of Business and Society, 21* (1), 111–133. https://doi.org/10.33736/ijbs.3230.2020
50. Martín, G., Ángel, M., Martínez, C., Soledad, M., Picazo, M. and Teresa, M. (2021). The role of entrepreneurship in different economic phases. *Journal of Business Research, Elsevier, 122*(C),171-179.
https://doi.org/10.1016/j.jbusres.2020.08.050
51. Mathew, N. and Varaprasad, G. (2020). Technology advancement: Factors influencing the adoption of electric vehicles in India. *In Proceedings of the 2020 International Conference on System, Computation, Automation and Networking (ICSCAN), Pondicherry, India*, 3–4 July 2020, 1–5.
https://doi.org/10.1109/ICSCAN49426.2020.9262449
52. McMullen, J.S., Brownell, K,M. and Adams, J. (2021). What makes an entrepreneurship study entrepreneurial? Toward a unified theory of entrepreneurial agency. *Entrepreneurship: Theory and Practice, 45* (5), 1197-1238.
https://doi.org/10. 1177/ 10422587209224
53. Melovic B, Veljkovic S.M, Cirovic D, et al. (2022) Entrepreneurial decision-making perspectives in transition economies – tendencies towards risky/rational decision-making. *International Entrepreneurship and Management Journal 18*: 1739–1773. https://doi.org/10.1007/s11365-021-00766-2
54. Mick, M.M.A.P., Kovaleski, J.L. and Chiroli, D.M.D.G. (2024). Sustainable Digital Transformation Roadmaps for SMEs: A Systematic Literature Review. *Sustainability, 16*, 8551. https://doi.org/10.3390/su16198551
55. Mirzaee, H. and Ashtab, S. (2024). Sustainability, Resiliency, and Artificial Intelligence in Supplier Selection: A Triple-Themed Review. *Sustainability, 16*, 8325. https://doi.org/10.3390/su16198325
56. NPE (2011). Zweiter Bericht der Nationalen Plattform Elektromobilita¨t. *Nationale Plattform Elektromobilitat,* Bonn
57. Nylund, P.A., Brem, A. and Agarwal, N. (2021). Innovation ecosystems for meeting sustainable development goals: The evolving roles of multinational enterprises. *Journal of Cleaner Production, 281*, 125329.
https://doi.org/10.1016/j.jclepro.2020.125329
58. OECD (2021). Economic Outlook. *OECD 2021*(1).
https://www.oecd.org/en/publications/2021/05/oecd-economic-outlook-volume-2021-issue-1_88e062cf.html
59. OICA (2010) *Production statistics*.
http://oica.net/category/production-statistics/
60. Precedence Research. (2025). Electric Vehicle Market Growth Fueled by Automotive Industry Electrification and Government Incentives. *Electric Vehicle Market Size, Share, and Trends*.
https://www.precedenceresearch.com/electric-vehicle-market
61. Raut, R.K.; Kumar, R.; Das, N. (2021). Individual Investors' Intention towards SRI in India: An Implementation of the Theory of Reasoned Action. *Social Responsibility Journal, 17* (7): 877–896.
https://doi.org/10.1108/SRJ-02-2018-0052
62. Rego, G.C.D. and Barreto, L.M.T.D. (2023). Creativity and innovation management in event organizing companies. *Podium-Sport Leis. Tour. Rev, 12*, 165–191
https://doi.org/10.5585/podium.v12i2.20279

63. Reijnders, L. (2021). Substitution, natural capital and sustainability. *Journal of Integrative Environmental Sciences, 18*(1), 115-142.
https://doi.org/10.1080/1943815x.2021.2007133
64. Rogers, I. and Bloomberg, A.D. (2019). Germany Boosts Electric-Car Incentives to Stimulate Demand. Providence Journal.
https://www.providencejournal.com/story/business/automotive/2019/11/09/germany-boosts-electric-car-incentives-to-stimulate-demand/2333327007/
65. Rosário A.T., Raimundo R.J. and Cruz S.P. (2022). Sustainable entrepreneurship: a literature review. *Sustainability, 14* (9) (2022), 5556.
https://doi.org/10.3390/su14095556
66. Sancho, M.P.L., A.R. Ramos-Rodriguez, A.R. and M.D.L. and Vega, M.D.L.A.F.(2022). The influence of university entrepreneurship-oriented training in the transformation of intentions into new businesses. International Journal of Management in Education, 20 (2),1-11.
https://doi.org/10.1016/j.ijme.2022.100631
67. Schaltegger, S., Beckmann, M., & Hockerts, K. (2018). Sustainable Entrepreneurship: Creating Environmental Solutions in Light of Planetary Boundaries. *International Journal Entrepreneurial Venturing, 10*, 1-16.
https://doi.org/10.1504/IJEV.2018.090990
68. Shepherd D.A, Williams T.A and Patzelt H (2015) Thinking about entrepreneurial decision making: review and research agenda. *Journal of Management 41*(1): 11–46. https://doi.org/10.1177/0149206314541153
69. Singh, S. and Aggarwal, Y. (2021). In search of a consensus definition of innovation: A qualitative synthesis of 208 definitions using grounded theory approach. Innovation: The European Journal of Social Science Research, 35(2), 177–195.
https://doi.org/10.1080/13511610.2021.1925526
70. Stake, R.E. (2006). *Multiple Case Study Analysis*. TheGuilfordPress, New York, NY.
71. Stockkamp, C., Schäfer, J., Millemann, J.A., Heidenreich, S. (2021). Identifying factors associated with consumers' adoption of e-mobility—A systematic literature review. *Sustainability*, *13* (19), 10975.
https://doi.org/10.3390/su131910975
72. Syed, I., Butler, J.C., Smith, R.M. and Cao, X. (2020). From entrepreneurial passion to entrepreneurial intentions: The role of entrepreneurial passion, innovativeness, and curiosity in driving entrepreneurial intentions. *Personality and Individual Differences, 157*, 1-6.
https://doi.org/10.1016/j.paid.2019.109758
73. The Missing Entrepreneurs 2021: Policies for Inclusive Entrepreneurship and Self Employment. *OECD and European Commission (2021)*.
74. Tohidi, H. and Jabbari, M.M. (2021). Innovation as a Success Key for Organizations. Procedia Technol, 1, 560–564.
https://doi.org/10.1016/j.protcy.2012.02.122
75. Tseng, T.H., Wang, Y.M., Lin, H.H., Lin, S.J., Wang, Y.S. and Tsai, T.H. (2022). Relationships between locus of control, theory of planned behavior, and cyber entrepreneurial intention: The moderating role of cyber entrepreneurship education *International Journal of Management in Education, 20* (3), 1-15.
https://doi.org/10.1016/j.ijme.2022.100682
76. Wang, C.N., Nguyen, N.A.T., Dang, T.T. and Lu, C.M. (2021). A compromised decision-making approach to third-party logistics selection in sustainable supply chain using fuzzy AHP and fuzzy VIKOR methods. *Mathematics, 9*, 886. https://doi.org/10.3390/math9080886
77. Wang, H., and Kimble, C. (2011) Leapfrogging to electric vehicles: Patterns and scenarios for China's automobile industry. *International Journal Automotive Technology and Management, 11*(4), 312–325.
78. Westman L., Luederitz C., Kundurpi A., Mercado A.J., Burch S.L. (2023). Market transformations as collaborative change: Institutional co-evolution through small business entrepreneurship. *Business Strategy and the Environment, 32*(2), 936-957, https://doi.org/10.1002/bse.3083
79. Wolf, V., Dobrucka, R., Przekop, R. and Haubold, S. (2021). Innovation strategies in the context of the paradigm of the five dimensions of innovation strategy. Logforum, 17, 205–211.
https://doi.org/10.17270/J.LOG.2021.587

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2026, 11(2s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

80. World Bank, (2011). PRTM Management Consultants (2011) The China new energy vehicles program – Challenges and opportunities, Beijing 2011.
http://www.prtm.com/uploadedFiles/Thought_Leadership/
81. Wood, M.S., Bakker, R.M. and Fisher, G. (2021). Back to the future: a time-calibrated theory of entrepreneurial action. *Academy of Management Review, 46* (1) (2021). 147-171. https://doi.org/10.5465/amr.2018.0060.
82. Wu, Q. (2010) Comments on draft for comment of the 'Development plan for the energy efficient and new energy car industry (2011–2020)'. *Dongfeng Qichewang, 30* (08).
http://mag.oauto. com/news/html/5959.html
83. Yang, M., Al Mamun, A., Mohiuddin, M., Al-Shami, S.S.A. and Zainol, N.R. (2021). Predicting Stock Market Investment Intention and Behavior among Malaysian Working Adults Using Partial Least Squares Structural Equation Modeling. *Mathematics, 9*(8), 873. https://doi.org/10.3390/math9080873
84. Zhang, L. (2011). 2013 could bring the opportunity for commercialization of EVs in China. *TX Investment Consulting Co.Ltd, Beijing*.
85. Zuluaga, J.C.S., Juárez-Varón, D., Mengual-Recuerda, A. and Corvello, V. (2025). Deeper knowledge of entrepreneurs in decision-making. Innovating through neuroentrepreneurship. *Journal of Innovation & Knowledge, 10* (4), 100739
https://doi.org/10.1016/j.jik.2025.100739