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Thriving in the Entrepreneurial Landscape of Sustainability and Intelligent Automation Era

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Abstract: The contemporary corporate landscape is undergoing a major shift, marked by a dual transformation toward sustainability and intelligent automation. As the world faces complex social and environmental challenges, entrepreneurs find themselves at a crossroads of unprecedented opportunities and daunting challenges. This study addresses the critical point where sustainability intersects with business automation, focusing on the complicated dynamics that entrepreneurs must navigate. The main concern is the need for entrepreneurs to effectively infuse the principles of sustainability and intelligent automation into their businesses. Recognizing the growing demand for environmentally conscious products and services alongside the profound impact of automation, entrepreneurs face the pressing challenge of crafting strategies that holistically embrace these paradigms. Thus, the study aims to discern the multifaceted landscape of entrepreneurial endeavors in this context. Methodologically, a combination of qualitative interviews with experienced entrepreneurs and quantitative surveys from various industries will be used, followed by thematic analysis to highlight general patterns. The study is based on a fusion of sustainable business frameworks and technology adoption models that support the exploration of entrepreneurial resilience in the context of sustainability and automation. The outcomes include an enriched understanding of the complex interplay between these dimensions and the discovery of strategies that fuel entrepreneurial triumph. This study's exploration of the intersection of sustainability, automation, and entrepreneurship resonates deeply with the principles of the green economy. By dissecting the challenges and strategies entrepreneurs use to embrace sustainability and automation, the research contributes valuable insights to the ongoing discourse on sustainable business practices within a burgeoning green economy. The findings will assist policy makers by providing useful information to cultivate an environment conducive to sustainable, technology-based entrepreneurship.

Keywords: entrepreneurship, sustainable development, intelligent automation

The green economy, driven by the increasing demand for sustainable goods and services, offers entrepreneurs a chance to create ventures that address pressing social and environmental issues. Simultaneously, advancements in automation and technology are revolutionizing business operations, opening doors to enhanced efficiency and creativity. To thrive in this transformative environment, entrepreneurs must acquire a new skill set. They need to harness the potential of intelligent automation by developing technological expertise, while also navigating the complex legislative and social frameworks surrounding sustainability. Additionally, adaptability and agility are paramount, enabling entrepreneurs to pivot their strategies and offerings as the business landscape continues to evolve.

1. Introduction

Recent trends in entrepreneurship have been distinctly marked by a paradigm shift toward sustainability, digital transformation, and the integration of artificial intelligence (AI). In response to pressing global concerns about environmental degradation and social issues,

there has been a pronounced emphasis on sustainability in entrepreneurial endeavors. Entrepreneurs are now inclined to create businesses that not only generate profit but also contribute positively to the planet and society. Simultaneously, the digital age has ushered in a transformative era of digital transformation, forcing entrepreneurs to recalibrate their strategies to harness the vast potential of technology. This includes optimizing operations through digital tools, expanding market reach through e-commerce, and making data-driven decisions. Moreover, the integration of AI, with its ability to process large volumes of data and obtain insights, has redefined the way companies innovate, optimize processes, and interact with customers. As these trends continue to shape the entrepreneurial landscape, understanding their implications becomes critical for practitioners and researchers alike.

The contribution of the research underlying this paper lies in its holistic exploration of the challenges and opportunities arising from the confluence of sustainability, digital transformation, and AI in contemporary entrepreneurship. Recognizing the vital role that entrepreneurs play in driving innovation and economic growth, this paper highlights the need to navigate the complicated intersections between these trends. It recognizes the multifaceted demands placed on entrepreneurs, who must not only master

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technological advances but also integrate sustainability principles into their businesses to remain relevant and competitive. Additionally, this paper serves as a call to action, emphasizing the importance of acquiring the essential skills and perspectives needed to thrive in this dynamic landscape. Delving into the nuances of intelligent automation, sustainability strategies, and adaptive approaches, this paper not only sheds light on current challenges but also equips entrepreneurs and policymakers with valuable insights to build a sustainable and technologically savvy future.

The inventiveness and ingenuity of the partnership between the academic, entrepreneurial, and corporate sectors have led to today's technological progress. The link between entrepreneurship, sustainability, and intelligent automation is the purpose of examination in this paper. We look at the opportunities and challenges this environment presents, as well as the critical skills and tactics young entrepreneurs must employ to succeed in the business world. This paper offers insights and advice to entrepreneurs trying to thrive in this dynamic and rapidly changing environment, from creating and integrating sustainability principles into their sustainable business model to using automation for competitive advantage. AI has advanced rapidly as a consequence of decades of work to give robots mental abilities and capabilities that approximate or even overdo those of individuals.

Developments in technology present a critical collection of concerns for upcoming philosophy development in entrepreneurial act, inventiveness, and decision-making exploration as the increasing complexity of AI's algorithms revolutionizes entrepreneurial behavior in uncertain situations. Modern AI systems are said to offer new approaches to overcoming the basic problems generated by modal uncertainty in business decision-making contexts. AI opens new avenues for potential entrepreneurial endeavors in the future (Bizhanova et al., 2019; Townsend & Hunt, 2019).

2. Literature Review

Throughout the course of industrialization's evolution, the interplay between growth, prosperity, and economic achievement has often been assumed. The focal concern has revolved around forging a harmonious and enduring developmental path, aligning with the principles of a green economy. Kyrö (2009) argues that economics and sustainable development can provide a new solution to the debate between economics and well-being through entrepreneurship. As a result, this research can be considered a starting point for alternative visions of development and sustainability in the era of intelligent automation.

Gawel has maintained since 2012 that entrepreneurship and sustainable development are not incompatible, despite the fact that entrepreneurship is more of an approach to behavior and sustainability is a set of principles and objectives. The application of the pro-social and pro-ecological postulates of sustainability is now called to offer quantifiable advantages for an entrepreneurship environment and be included in a company's strategy for a positive link between the two (Gawel, 2012). Two years later, Zhang and Swanson (2014) claim that social entrepreneurship progresses ahead of social, economic, and environmental efficiency and effectiveness, thereby influencing corporate viability or which influences corporate viability.

Sustainable entrepreneurship is now considered a potential strategy for finding creative solutions to challenging social, environmental, and economic problems. The strategy aims at three

aspects: (1) the participation of different businessmen in entrepreneurial developments; (2) harmonization among sustainability matters and entrepreneurial addressing problems; and (3) collaboration across sectors between various types of entrepreneurs, including social entrepreneurship, sustainable entrepreneurship, and political entrepreneurship (Schaltegger et al., 2018). Consequently, it can be seen how sustainability raise the significance of entrepreneurial collaboration in these three approaches.

Later, in 2020, entrepreneurship for sustainable progress was considered a multi-level circumstance that brings together social, environmental, and economic elements among new business activities, market transformations, and significant societal developments (Johnson & Schaltegger, 2020). Certainly, references were also made to the impact of the implementation of automatic intelligence in most sectors of activity.

The present debates on sustainable development touch on crucial issues relating to the value of innovation and strong institutions for attaining sustainability (Youssef et al., 2018). Although entrepreneurship has grown significantly in recent decades in world economies, governments are concerned about its long-term stability. Entrepreneurship and innovation ecosystems have only recently become a research topic. The ability of entrepreneurs to successfully assume and handle a balanced direction to improve the excellence and exposure of entrepreneurship has increasingly emerged as one of the strategic goals of new businesses. Therefore, it is contended that effective and growth-oriented entrepreneurial activity is influenced by high standards of institutions and the administration of entrepreneurs' sustainable orientation (Audretsch et al., 2023).

In the same line of research, in 2023, Hunjra assesses the effects of organizational effectiveness on sustainable development in 65 emerging countries in different geographic areas from 1984 to 2019. It considers net savings that have been adjusted for economic viability as indicators of sustainable development. The outcomes of this investigation demonstrate that institutional quality has a constructive effect on long-term economic stability (Hunjra et al., 2023). The current research aligns with this result, arguing that political stability, administrative capacity, and responsible political system must be seen in all sectors of activity and at all levels to achieve sustainable development.

Two of the largely dominant assumptions of dedicated choice in entrepreneurship are settled on the concepts of risk aversion (Kihlstrom & Laffont, 1979), and balanced ability (Lazear, 2005). Explicitly, if entrepreneurship is a hazardous enterprise than remunerated work and if people are different pertaining to their risk appetite, subsequently it results that the smallest hazard aversion is the most likely to develop entrepreneurs. It seems that, in the development of entrepreneurship, risk aversion and the concepts of balanced skills are undoubtedly combined. The research observed that a good number of psychology-grounded analyses have not succeeded to detect slight differences among entrepreneurs and non-entrepreneurs when it comes to risk mindsets (Brockhaus, 1980; Shaver & Scott, 1991). The current research believes that the aptitude for risk, together with more developed skills and a high level of information and education, can be part of the competencies needed to become a successful entrepreneur. In the same line with the need for high skills to develop into an entrepreneur and to kick off a novel business project, it was pointed out that entrepreneurs can show ethical perceptive skills at a slightly higher level than general middle-level managers, based on current theory in the fields of business ethics, entrepreneurship, and psychology (Teal & Carroll, 1999).

Similarly, the notion that, in addition to having a certain set of innate skills, entrepreneurs must also continually develop their capabilities by investing in human capital was reaffirmed. Thus, formal education is utilized to broaden the skill set of those who decide to become entrepreneurs (Lazear, 2004). The current research agrees with this statement, considering that through the process of personal development, participation in training courses, workshops, and other activities in the entrepreneur's field of interest increases access to information and enhancement of innovative ability.

Given the current social, financial, and economic difficulties faced by most nations, motivating entrepreneurship has become a key objective in economic support and growth. Numerous scholars have emphasized the magnitude of entrepreneurship for economic expansion, and the development of associated skills is now included in university education curricula. University education may be crucial in fostering aspiring entrepreneurs and helping established business owners improve their abilities so that they can expand and achieve greater levels of success.

The past 10 years have seen significant growth in entrepreneurship research, which now covers a wide range of topics and issues. Advances in AI are proving to have both good and bad effects on the pursuit of sustainable development. Growing sustainable businesses increasingly involves digital skills and abilities in the modern economy. According to 2020 research by Tkachenko, the entrepreneur's willingness to adopt AI is positively influenced by performance expectations, openness, social influence, hedonistic motives, and generativity. Furthermore, interaction with AI influences the intention to adopt AI through attitude rather than having a direct link with it. According to this study, to which our research also adheres, the possibilities offered by the automation of intelligence are already recognized (Tkachenko et al., 2019). According to Giuggioli and Pellegrini (2022) and current research, AI has significant effects on entrepreneurship. In particular, it benefits entrepreneurs in four different ways, through opportunity, decision-making, performance, and education and research.

The current discussion on sustainable development places a strong emphasis on the need for environmental protection, societal norms, and sound economic principles to achieve these goals, especially in developing nations. To achieve viable development objectives, experts have recently suggested the utilization of computations and patterns based on AI. This study intends to clarify the critical role that AI plays in promoting sustainable growth in this setting (Gupta et al., 2023) and it signals that there is optimistic correlation between AI and world development on sustainable entrepreneurship.

3. Research Methodology

3.1. Research design

The research design for this study involves employing a qualitative methodology to comprehensively investigate the substantial shift toward sustainability and intelligent automation. This choice of methodology is informed by the need to delve deeply into the subject matter, given its relatively nascent nature and evolving dynamics. The selected approach, specifically exploratory research, aligns well with the objective of gaining a profound understanding of this phenomenon. The research includes five stages: rationale; justification; data collection; data analysis; and contribution and implications.

Step 1: Rationale for Qualitative Methodology: The decision to utilize qualitative research methodology is grounded in the desire to explore the multifaceted dimensions of sustainability and intelligent automation within the entrepreneurial context. Qualitative research facilitates an in-depth exploration of complex phenomena, allowing for rich insights, nuanced perspectives, and contextual understanding. This approach is particularly fitting for a topic characterized by evolving paradigms and limited established research.

Step 2: Justification for Exploratory Research: The study's intent to unearth novel insights about the interaction between sustainability, green economy, intelligent automation, and entrepreneurship makes exploratory research highly appropriate. Exploratory research aims to shed light on emerging topics, providing a foundational understanding that can guide future investigations.

Step 3: Data Collection Techniques: To achieve the research goals, a multifaceted data collection strategy is proposed. Researchers intend to conduct in-depth interviews with entrepreneurs, business owners, and experts who possess firsthand experience in navigating the intersection of sustainability and automation. These interviews will provide a platform for respondents to share their experiences, perspectives, and strategies. Additionally, focus groups are organized to encourage dialogue and generate diverse viewpoints. Supplementary data will be extracted from relevant literature in the field to enrich contextual understanding.

Step 4: Data analysis: Qualitative data obtained from interviews, focus groups, and literature are or were subjected to a thematic analysis. This process involves identifying recurring themes and insights. The researcher will engage in an iterative process of categorizing data segments, ultimately achieving a comprehensive thematic framework that encapsulates the experiences, challenges, and strategies of entrepreneurs in the context of sustainability and intelligent automation.

Step 5: Contribution and Implications: The qualitative exploratory research approach holds the promise of uncovering facets of how entrepreneurs navigate the evolving business landscape marked by sustainability imperatives and intelligent automation. The findings will provide pertinent information on the strategies and adaptations employed by entrepreneurs, contributing to a broader understanding of these trends.

3.2. Findings and discussions

The intersection of entrepreneurship, sustainability, and intelligent automation refers to the point where these three concepts converge and interact to generate novel openings and challenges in the business landscape. A thriving entrepreneurial environment is possible as a result of fast and open access to information and education, which is increasingly used in most business sectors. How to make it sustainable is still the only problem. Entrepreneurship, sustainability, and intelligent automation are already intertwined, and this interaction will intensify even more as technology develops and consumer demand for sustainable company practices increases. It can be found in a wide range of fields and businesses, from sustainable agriculture and renewable energy to smart cities and intelligent transport systems.

The convergence of sustainability, entrepreneurship, AI, and the Industrial Revolution 5.0 forms a transformative nexus that is reshaping the global business landscape. As the world grapples with pressing environmental concerns, entrepreneurship has evolved beyond profit-driven pursuits to embrace sustainable practices at its core. This shift aligns perfectly with AI

capabilities, which provide advanced data analysis, predictive insights, and automation that underpin sustainable business principles. The Industry 5.0 revolution, characterized by the fusion of the digital, physical, and biological realms, provides the framework through which these elements harmonize, ushering in an era in which sustainable entrepreneurship harnesses the power of AI to drive innovation, optimize processes, and pave the way for a future more environmentally conscious and economically viable.

Researchers think that the new Industry 5.0 has the potential to go beyond financial gain. Industry 5.0 is a new and developing stage of industrial development that involves individuals collaborating with cutting-edge technology and AI-powered robots to advance workplace procedures and emphasizes sustainable development objectives including human-centeredness, socio-environmental sustainability, and resilience while putting Industry 4.0 productivity on the front line. Industry 5.0 provides justifiable development standards with many functions, including but not limited to circular smart goods and utilities, employee technical support, intelligent automation, sustainable uncluttered novelty, incorporation of renewable sources, and sustainable entrepreneurship using automatic intelligence. The relationship between the new approach to the economic development of Industry 5.0, which is based on automatic intelligence, the sustainable growth of entrepreneurship and the business environment, and the essential ideals of sustainability, is shown in Figure 1 (Ghobakhloo et al., 2022; Morteza et al., 2022).

Business practices are already starting to change in favor of social and environmental sustainability, thanks to sustainable entrepreneurship (Moşteanu & Mesue, 2023). Due to the development of rules for various sustainability-related fields, the high availability of impact investments, the quick, flexible, and financially accessible access to new informational technologies, and the nation's extensive entrepreneurial ecosystem, it is beginning to acquire appeal. The research conducted by Tunçalp and Yıldırım (2022) highlighted the ways in which sustainable enterprises might contribute to the sociotechnical shift toward a sustainable future.

The regions covered by sustainable entrepreneurship from 2014 to 2020 are shown in Figure 2 (Tunçalp & Yıldırım, 2022). After the Intelligence Automation boom in 2021 and present times, the present research tends to believe that entrepreneurship in IT industry will also take a good share.

The current study found that enterprises functioning in this environment face both possibilities and problems because of the junction of intelligent automation and sustainable entrepreneurship. Figure 3 presents both opportunities and challenges. Businesses that can successfully navigate these challenges and leverage the opportunities presented by intelligent automation are likely to be competitive, innovative, and sustainable in the long run.

Covid-19 has opened the door for the implementation of the digitization era in most sectors of human activity. Digitization and promotion of sustainable entrepreneurship have led to new areas of development, such as (1) reducing carbon emissions by implementing remote work, electronic commerce, and online services (however, the energy consumption of data centers and other digital infrastructure can also have a significant carbon footprint) (2) protection and efficient use of sacred resources (Digital technologies can enable more circular business models, such as the sharing economy and product-as-a-service that reduce waste and promote sustainability) (3) development of safe and sustainable supply chains. Digital technologies can enable greater openness and accountability in supply chains, which can facilitate, distinguish, and tackle sustainability issues; and (4) the development and execution of alternative energy supplies. Digital technologies can also support the enhancement and exploitation of renewable energy resources such as solar and wind power (Moşteanu, 2023).

We could certainly notice that Automated Intelligence tools offer a quick access to information, to data analysis, it saves our working time. However, the new informational technologies also raise issues related to security, ethics, or the equity of access to information. From this point of view, the research identified three big challenges: (1) increased cyber security, which can have serious implications for privacy and data protection; (2) lack of fair access to information sources as digitization has caught many

Figure 1
The intersection among intelligent automation, business, and entrepreneurship and sustainability

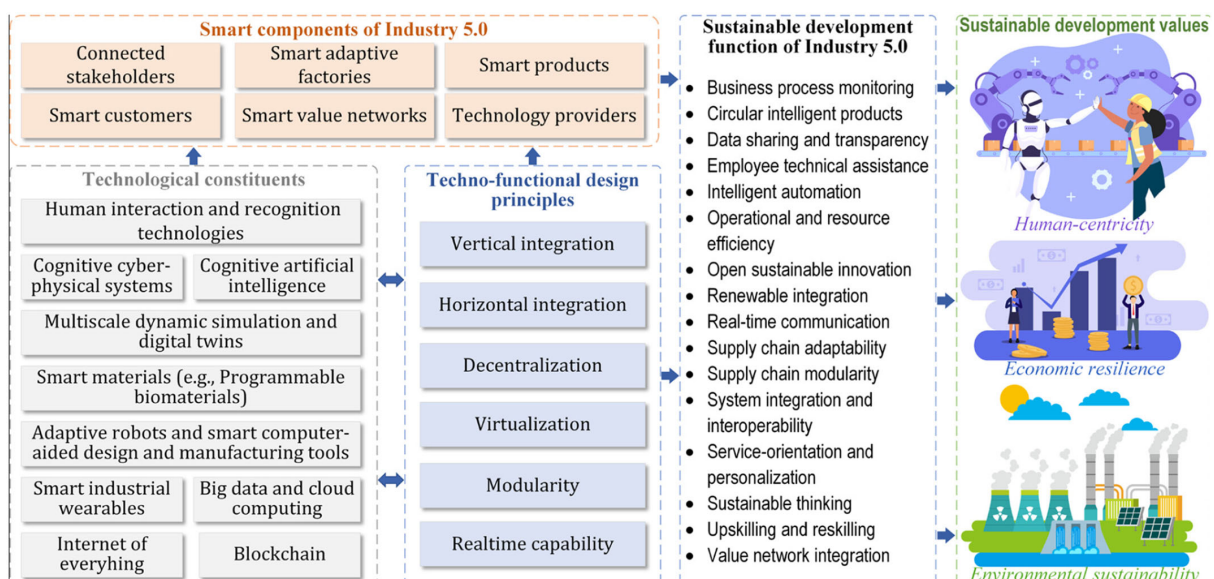


Figure 2
Areas covered by sustainable entrepreneurship, during 2014–2020

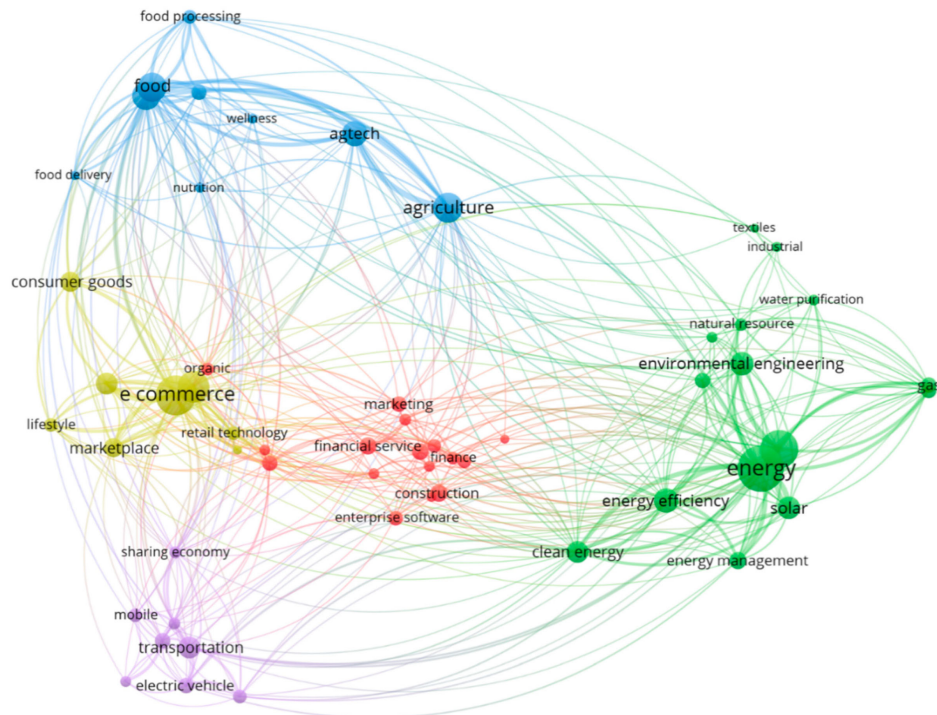





Figure 3
Opportunities and challenges in implementing intelligent automation for sustainable entrepreneurship




COST SAVINGS. One of the main advantages of intelligent automation is that it can help new businesses start up the business with low costs and keep them at a low turnover level by automating repetitive and routine tasks. Sustainable entrepreneurs can use this technology to reduce waste and energy consumption, thereby reducing operational costs.




INNOVATION. Intelligent automation can drive innovation, allowing businesses to explore new business models and product offerings. For sustainable entrepreneurs, this presents an opportunity to develop new products and services that address environmental and social issues.




MARKET DEMAND. Consumers and investors are increasingly demanding sustainable products and services. By operating in the sustainable entrepreneurial landscape, businesses can take advantage of this growing market demand and attract environmentally conscious customers and investors.



IMPLEMENTATION. Intelligent automation can be complex and difficult to implement. New businesses may require significant investment in infrastructure and technology, as well as expertise to manage and operate these systems.



ETHICS. The use of intelligent automation raises ethical concerns, particularly in terms of replacing human labour. Sustainable entrepreneurs must consider the potential impact of automation on their employees and the wider community.



COMPLIANCE. Regulations related to sustainability and environmental protection can be complex and difficult to navigate. Businesses operating in the sustainable entrepreneurial landscape must ensure that they comply with relevant laws and regulations to avoid penalties or reputational damage.

municipalities off guard, so many geographical areas do not have access to the Internet or not everyone has equal access to digital technologies, which can exacerbate existing social and economic inequalities; and (3) challenges relating to the ethics of using AI resulting in biasness, lack of transparency, and accountability.

In terms of competences, the present research observes that entrepreneurship involves a dedicated range of skills and capabilities. Core entrepreneurial skills refer to DigiTech skills, leadership and business management skills, and innovative rationality. To develop and sustain productive project teams, there

is a need in upgrading governance, supervision, management, and interpersonal skills. Figure 4 shows the main skills needed by an entrepreneur, before the road to a successful business. An open and creative mind will definitely help.

Flourishing entrepreneurs will most frequently depend on their business capabilities to run and market the business. They must be passionate about business, have management skills, have the ability to multitask, delegate responsibilities to subordinates, and make appropriate choices regarding the success of the business. Critical and strategic thinking are equally vital. To be prosperous entrepreneur, it requires planning and the ability to think strategically, to visualize the end goal, but also the roadmap. In this way, it will be easier to see the path needed to beat the competition, increase market share, or employ appropriate strategies. Analytical skills, which entail ability to look at and analyze challenges, circumstances, plans, and functions from different angles, can help to make pertinent judgments, take appropriate verdict, and solve issues. Critical thinking skills are also beneficial and are required for tactical projection and evaluation of existing methods employed in the business and for amending overall strategies of the business. Entrepreneurs must be adaptable and able to turn quickly in response to modifying environment conditions, regulations, and technological advancements. Individuals who think to start a new business must also have a good perception of sustainability issues, trends, and be capable to incorporate sustainable practices and principles into their business operations.

The proficiency to work in a team is also essential; as the owner of the business, the entrepreneur is the one who executes, controls, supervises, and therefore it is good to have effective leadership capabilities to inspire the group. Leadership by example which is about the way the message is sent to others is also playing a key role in successful entrepreneurship. Communication involves active listening skills in discussions during meetings and effective communication. Communication also helps to construct and consolidate the new enterprise idea. Effective communication helps the business by promoting effective and clear messages, which positively influence the way targeted stakeholders are

reached. Client facility skills can lead to attracting and maintaining customers, opening partnerships, and conducting relevant market studies to ensure that the products or services created by the entrepreneur are the ones the market wants.

Booming novelty start-ups usually have extraordinary systematic and problem-solving skills. Entrepreneurs must have the ability to make difficult decisions, in stressful situations, and in a relatively short period of time. Finding solutions to barriers and applying innovative skills believing to advance the strategies and tactics of the business could also facilitate attaining business's aspirations.

Understanding of financial and accounting processes is necessary. The way in which monetary value can be created brings a plus to entrepreneurship, because financial aspects are extremely important, especially at the beginning and in the first part of business development. An entrepreneur would do well to develop financial planning skills either by completing short-term executive courses or by self-learning, using new information techniques as well as specialized programs in the field. This will help in organizing and following up of the financial processes of the newly created business. Using different programs (for financial analysis, planning, marketing, and other business processes), developing technical capabilities appears to be imperative. Entrepreneurs with effective technology skills can use software and other digital tools to manage projects and ensure business performance. In an era of intelligent automation, entrepreneurs must have a solid understanding of the latest technological trends and tools, as well as the ability to leverage these tools to improve their business operations.

Time management is an important skill as well. Currently, there is different software or other digital tools that can help to organize business files. Sustainable entrepreneurs must be agile and able to move quickly to capitalize on emerging opportunities or respond to new challenges.

Last but not least, another important ability refers to the ability to promote the newly created business. The ability to employ winning marketing tactics can be an essential point in growing into an entrepreneur. Innovation is critical in the sustainable

Figure 4
Entrepreneurial skills



entrepreneurship landscape. Entrepreneurs must be able to think innovatively and develop new solutions to address sustainability challenges. Nevertheless, the sustainable entrepreneurship landscape is complex and challenging, and entrepreneurs must be resilient in the face of setbacks and obstacles.

Moving from theory to practice, the implementation of intelligent automation in sustainable entrepreneurship, especially in the green economy, presents a constellation of challenges. Integrating diverse technologies such as AI and robotics with green principles requires a nuanced understanding of both fields. The initial costs of automation systems can demand the financial resources of sustainable enterprises. Bridging the skills gap between the requirements of automation and the capability of the available workforce is an obstacle. Adapting existing workflows to accommodate automation requires significant adjustments. Ethical concerns about job displacement and social responsibility are emerging as automation reshapes the employment landscape. Protecting data privacy and security while leveraging the data-driven insights of automation requires a careful balance. Ensuring compliance with strict environmental regulations without compromising automation efficiency is complicated. Customizing automation to fit the unique processes of sustainable entrepreneurship while maintaining efficiency is a juggling act. In addition, fostering a culture of technology acceptance and continuous learning is crucial in the midst of these transformative changes. Balancing these challenges is vital to realizing the potential benefits of intelligent automation in sustainable entrepreneurship within the evolving green economy.

4. Conclusion

Entrepreneurship is a vital ingredient and process for assuring sustainable development, because it safeguards the growth of the national economy and the well-being of the population (Filippova et al., 2021). Present research admits that it is an obvious line among entrepreneurship, sustainable economic development, population well-being, and getting advantage of intelligent automation as well.

The establishment of companies that prioritize environmental and social responsibility alongside profit growth is the point where entrepreneurship and sustainability converge. In other words, it is the intersection of sustainable business practices and entrepreneurship. Due to the urgent environmental and social issues the world is facing as well as the need for businesses to run more effectively and efficiently, the confluence of these three ideas is becoming more and more significant. Entrepreneurs who are able to navigate this intersection are well-positioned to create successful businesses that not only generate profits but also contribute to the greater good of society. Entrepreneurship plays a crucial role in achieving sustainable development as it is an essential process and factor that contributes to the growth of both the national economy and the well-being of the population.

The research considers that entrepreneurs who want to catalyze sustainable development through AI can adopt a multifaceted strategy. By leveraging AI's analytical prowess, companies can explore vast data sets to identify opportunities for green practices, optimize resource allocation, and predict supply chain disruptions. Integrating AI into circular economy solutions enables product reuse and reduces waste. Intelligent supply chains, guided by AI insights, minimize transport inefficiencies and align production with real-time demand. In addition, AI-enhanced renewable

energy systems, fine-tuned using predictive algorithms, increase the efficiency of renewable sources, contributing to the generation of cleaner energy.

Entrepreneurs can also use AI to empower consumers by providing personalized insights into environmental footprints and suggesting sustainable lifestyle choices. AI ethical frameworks should be integrated to ensure responsible decision-making that considers social and environmental impact. Collaborative innovation between entrepreneurs, AI experts, and sustainability advocates promotes interdisciplinary solutions. As technology evolves, continuous learning and adaptation remain essential for entrepreneurs to drive sustainable development through AI, steering business practices toward a greener and more socially conscious future.

The research concludes that the connection between AI and sustainable development reveals a landscape full of potential for entrepreneurial innovation. Using the analytical capabilities of AI, companies can orient their practices toward resource efficiency, renewable energy optimization, and customized sustainability initiatives. However, these efforts are not without challenges. Finding a harmonious balance between technology adoption, ethical considerations, and sustainable values requires a meticulous and agile approach. Entrepreneurs who navigate these complexities with foresight and adaptability are poised to drive transformative change in shaping a more environmentally conscious and socially responsible future.

Recommendations

Prioritizing the ethical and responsible use of technology is one of the most crucial recommendations for attaining sustainable entrepreneurship through intelligent automation. This entails taking into account any potential social and environmental effects of business decisions and guaranteeing that the use of automation technology is consistent with values and the requirements of business stakeholders. Additionally, it is crucial to regularly assess and track the effects of automation projects and change as necessary to reduce any unfavorable effects.

The research believes that, in light of this transformative landscape, some key recommendations emerge for entrepreneurs who aspire to harness AI for sustainable development. First, fostering interdisciplinary collaboration between AI experts and sustainability practitioners is essential for co-creating innovative solutions. Second, adherence to transparent and ethical AI practices ensures responsible decision-making that aligns with sustainability goals. Third, consistent investment in workforce development and training closes the skills gap in both AI and sustainability. Finally, fostering public awareness through educational initiatives and engagement campaigns empowers consumers to make sustainable choices. Competent authorities should establish supportive policies that stimulate sustainable initiatives based on AI while safeguarding ethical principles. In this journey to a greener and fairer future, entrepreneurs are pioneering, driving meaningful change through sustainable development based on AI.

Conflicts of Interest

The author declares that she has no conflicts of interest to this work.

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