

## **WOMEN ENTREPRENEURIAL RESILIENCE: THE IMPERATIVES OF INTEGRATING ARTIFICIAL INTELLIGENCE IN NIGERIAN SMES**

**Mercy Ughuere Dienne PhD.**

Department of Employee Relations and Human Resource Management, Faculty of  
Administration and Management, Rivers, State University, Nkpolu-Oroworukwo, PMB 5080,  
Port Harcourt, Rivers State. Nigeria.

***Abstract:** This paper reviews the imperatives of Artificial Intelligence (AI) integration in women's entrepreneurial resilience. AI is identified as not only useful in the development of competencies for coping and thriving during change events, through learning and knowledge development, but it is also affirmed to equip women entrepreneurs with the required systemic disposition and strategic posture for effective recovery and sustained economic activities after change events that are unfavourable or unpleasant. In this paper, a shift is offered from the emphasis on external support stemming from partnerships, networks and funding, to the internal, emphasising resource control, coordination and development; hence the adoption of a resource-based view theory as the theoretical framework for the paper. It is therefore the position of this paper that AI integration, bolsters women's entrepreneurial resilience; it is thus recommended that AI integration, build on the specificity of the SME and its context for enhanced operational support and resilience outcomes.*

***Keywords:** Women entrepreneurial resilience, organisational change, artificial intelligence, resource-based view, environmental turbulence.*

### **INTRODUCTION**

The Nigerian business environment is changing. Its dynamism is linked to a variety of human factors and non-human conditions, all of which have demonstrated the need for improved resilience. Aladejebi (2020) reported that increasing market volatility due to competition, the frequency of policy changes, high exchange rates, and inflation have negatively impacted small and medium enterprises in the country. These are coupled with the noted instability of the environment, reflected in natural disasters such as flooding in the country; further increasing the volatility and unpredictability of the environment. These observations, spur concern over the well-being of entrepreneurs, particularly women entrepreneurs, and their ability to cope and thrive amidst such setbacks (Atungwu, 2024). According to Ajani et al (2021), women's entrepreneurship has over the years attracted attention, due to its significance in women's development, empowerment and the economy as well. Their success in entrepreneurship, cuts across both micro and macro-economic concerns (Adetoyinbo, 2021; Adepoju et al, 2022), hence, addressing and enhancing women's entrepreneurial resilience is, therefore, a socio-economic imperative within the context of Nigeria today.

While research about women's entrepreneurial resilience is broad, transversing issues such as the balancing of family roles with economic activities, poor access to funds, patriarchal ideologies and values and the impact of these on women's entrepreneurial decisions, choices and success (Halkias & George-Ufot, 2021; Jaiyeola & Adeyeye, 2021; Dash et al, 2020; Bastida et al, 2020), this research however, limits itself to the barriers posed by aspects of the socio-economic environment of women entrepreneurs, particularly such that has to do with their coping strategies and ability to survive in the face of dynamic market conditions, natural disasters such as flooding, and the competitive turbulence in their environment (Anyansi, 2021; Ajani et al, 2021). Thus, women's entrepreneurial resilience from this perspective describes the ability or capacity for not only economic or financial recuperation but also the decision to yet, continue in related entrepreneurial activity and business (Anyansi, 2021; Acevedo-Duque et al, 2021; Nautiyal & Pathak, 2023). According to Anyansi (2021), the capacity for entrepreneurial resilience builds not only on access to financial support or funding but also on the social capital and support systems inherent in the networks, partnerships and relationships developed over time.

Anyansi's (2021) view, however, coincides with the dominant position in terms of research with most studies (Ajani et al, 2021) focusing on the leveraging of external support systems, with scant interest channelled toward addressing the role of internal coordinating or control systems. One of such is the adoption and integration of Artificial Intelligence (AI) in the management of SMEs. Artificial Intelligence describes the various smart technologies and systems, that simulate human learning, engaging in analytical decisions and problem-solving activities (West, 2018; Knight, 2019). According to Lee et al (2019), AI facilitates creative and systematic solutions to organisational problems, enabling data integration and the effective coordination of organisational units, processes, and resources. However, studies have barely addressed the role of AI in women's entrepreneurial resilience. As earlier pointed out, much of entrepreneurial resilience research has centred on support and opportunities advanced within the external environment and networks of the entrepreneur, with a paucity of research addressing internal capacities, such as those necessitated through the integration of AI.

This paper thus contributes as it discusses the imperatives of integrating AI for improved outcomes of women's entrepreneurial resilience in Nigeria. This is a departure from previous focus as it advances a shift from extant studies (Ajani et al, 2021; Jaiyeola & Adeyeye, 2021; Dash et al, 2020) that have emphasized external support systems and networks in the reinforcement of women's entrepreneurial resilience, to a focus on internal systems, specifically the integration of the AI in strengthening the operations and resilience capacity of female owned SMEs within the context of Nigeria. The paper is designed as a theoretical paper, and its focus on the concepts of AI integration and women's entrepreneurial resilience, draws on the nagging challenges women entrepreneurs experience in coping and effectively navigating through the turbulence in their environment, given the emerging significance and noted role of AI in business management practices today. The related objectives of this paper are therefore to:

- i. Discuss the concepts of AI integration and women's entrepreneurial resilience
- ii. Discuss how AI integration can be leveraged in enhancing outcomes of women's entrepreneurial resilience for Nigerian SMEs
- iii. Proffer recommendations based on the particular concerns and issues addressed in the paper

## **REVIEW OF LITERATURE**

### **Resource-Based View Theory**

The resource-based view theory, as proposed by Barney in 1991 (Kozlenkova et al, 2014), emphasizes the resources of the organisation as important in facilitating its own unique and inimitable position within the market; strategic and suited to ensuring its competitiveness. This is because, organisations through the development of their resources, human and non-human, can carve out structures, capacities and systems that align with their overarching values, and learning, and that way, offer them such a unique approach to addressing their problems (Kozlenkova et al, 2014). The resource-based view theory, affirms to the imperatives of focusing inwards and strengthening related infrastructures, competencies and systems and that way, competing or engaging the market in way that is distinct and reflective of the organisations own values and learning outcomes (Utami & Alamanos, 2023). The resource-based view theory in this manner, thus serves as a theoretical premise in understanding and predicting the outcomes of such inward focus on the organisation's resources and the extent to which such can be harnessed in driving the well-being and competitiveness of the organisation.

The resource-based view theory, serves as a useful lens in understanding and predicting the relationship between AI integration and women entrepreneurial resilience in Nigeria. Its position on the significance of internal systems development and the reinforcement of the organisation's technologies, such as expressed in the integration of AI, identifies with the suitability or alignment of such systems to the unique problems and concerns of women entrepreneurs; advancing a more specific and tailored framework toward data management and resource coordination, as well as the application of such in ways that address the business-environment alignment needs of SMEs (Aktar et al, 2016; Soni et a, 2019). Kozlenkova et al, (2014) posited that one of the fundamental arguments for the resource-based theory is that, organisations as unique entities, experience their environment and perceive it different, from the way others perceive or experience it. Thus, the conditions that necessitate or are interpreted as challenges or opportunities for these organisations can only be best addressed uniquely as well, based on the history and learning of the organisations.

### **AI Integration**

AI integration describes the related steps and actions involved in incorporating AI systems and technology into the operations of the business (Semmler & Rose, 2017; Reim et al, 2020). While the process or approach toward integration may vary extensively across organisations, its primary purpose remains the same, and that is strengthening the capacities of the organisation's system, ensuring a more coordinated and viable outcome of functions and operations for the organisation (Agrawal et al, 2017). Some scholars (Lepri et al, 2017; Bryson, 2018) have nonetheless raised concerns over the growing dependence of organisations on AI, and the implications of such on the vulnerability of organisations and their data and information to cyber criminals and hackers. Bryson (2018) identified concerns over the ethicality and the extent of professionalism applied in the adoption and use of AI, particularly regarding customer or client data. These issues emphasize the need for establishing and enforcing regulatory frameworks and processes that not only

streamline the application of AI systems but also ensure adherence to ethical practices and standards (Bryson, 2018).

The integration of AI into businesses, not only boosts the operations of the organisation, it also allows for increased control and coordination of the various facets and processes of the organisation (Gartner, 2021). Lee et al (2019) observed that AI facilitates an advanced level of human-computer interaction that is unprecedented. This builds on software programming, data transfers and learning actions, that advance computer simulations of reality, and thereafter, accelerated and innovative solutions to particular problems. Lee et al (2019) further argued that AI and its emergence is a demonstration of the extent of development in human as well as business prowess. However as earlier pointed out, there is the need for a reflexive stance when it comes to the development of AI systems and their application in both social and economic activities. Such reflexivity is necessary in measuring its usefulness, extent of benefits, and also in ensuring ethical compliance, especially in terms of customer or client information, data security and creative content or intellectual property (Bryson, 2018; Agrawal et al, 2017).

### **Women Entrepreneurial Resilience**

Resilience describes a capacity for recovery. It implies that an individual, or a business, has the necessary resources, structures and systems that enable it to rebound and effectively recover from unpleasant or unfavourable experiences (Pita & Costa, 2021; Korber & McNaughton, 2018; Al-Omouh et al, 2023; Gupta, 2021). As Acevedo-Duque et al (2021) noted, resilience is considered both competence and capacity as it demonstrates understanding or adeptness of the environment, and second, it suggests the possession of attributes, features or characteristics that assure support and as such the individual or organisation's recovery from turbulent events. Thus, women's entrepreneurial resilience indicates the competence of women in dealing with or addressing the negative impact of the environment on their businesses due to their acquaintance and knowledgeable ability of the factors or conditions that underlie the environment, and at the same time, it also points to the various capacities expressed by these entrepreneurs in terms of support systems and operational structures that ensure the survival of the SME (Acevedo-Duque et al, 2021; Manishimwe et al, 2023).

Adetoyinbo (2021) posited that in Nigeria, women entrepreneurs are central to the development of communities. While their engagement in entrepreneurship is often spurred on by the need to support their families, report (Adebiyi et al, 2017; Anwana & Aroba, 2020) shows that it has enriched the commercial well-being and contributed to the development of communities in various parts of the country. Hence, women's entrepreneurial resilience benefits not only the female entrepreneur, or her family, but its positive effect extends much wider than her local context. Kogut and Mejri (2022) also argued that to thrive and scale the economic and environmental hurdles that characterise most developing and turbulent markets such as that of Nigeria, SMEs must be accommodating of change, constantly reassessing their systems and behaviour to ensure change receptivity and that way, consistently reconfigure themselves to exploit the emerging opportunities that may accompany such change. This resonates with Ghouse et al (2021) observation that resilience is not necessarily reactive, but most often it is proactive; with the organisation planning, constantly assessing its capacities and evaluating its strategies in case of unforeseen events. Key measures of resilience, applicable as well within the context of women entrepreneurs (Kogut & Mejri, 2022; Gupta, 2021) are situation awareness and adaptability.

**Situation awareness:** This refers to condition of knowledgeability of the environment or the context of operation. Situation awareness is the SMEs intelligence and informed position on the factors or characteristics that prevail and are particular to the environment in which it is sited (Kogut & Mejri, 2022). Kogut and Mejri (2022) noted that knowledge of the context, is a precondition for the adjustment or reconfiguring of the SME for survival and effectiveness within its environment. Kogut and Mejri (2022) argued that the situation awareness is reinforced through the quality of relationships SMEs share with their various stakeholders, and their engagement of various interest groups and parties in their industry, this way, it can also be considered essential for the embeddedness of the SME.

**Adaptability:** This draws on the extent to which the SME is able to alter its existing processes, structure and features to accommodate change events within its environment. It is imperative that SMEs are able to adapt or adjust their features or attributes to match the emerging concerns in their context; this assures not only of their ability to survive, but also of their ability to realign their processes and approaches to suit the related variations or changes within their markets as well (Kogut & Mejri, 2022). Adaptability, apart from its significance in competition, also draws on the SMEs capacity for alternatives or options during moments of change, such as in distribution channels, or warehouses etc. It is as such an important facet of resilience as it ensures the continuity of operations and as such the survival of the SME (Kogut & Mejri, 2022; Adebisi et al, 2017).

### **AI Integration and Women Entrepreneurial Resilience**

Resilience, as pointed out in the preceding section, borders on the knowledge or understanding of the environment, and also the existence of structures or systems that aid in the flexibility or capacity for recovery for the organisation (Korber & McNaughton, 2018; Nautiyal & Pathak, 2023;). Soni et al (2019) noted that AI facilitates data and information transfers, increasing insight and knowledge about events, groups, and a variety of factors key to the effectiveness of SMEs. This corroborates West (2018) observation that AI supports learning and the management of information such that enriches both market and business intelligence, driving improvements to both service and product customizations. Such enhances the SME's awareness of their environment, as it can be used to not only generate and maintain data on the prevailing factors that define or shape a particular market or economic context but it can also be used to predict the outcomes of relationships within contexts using trends and historical data (Lee et al, 2019).

AI can also be configured to address the related concerns of managing the vulnerability of SMEs. This is because AI systems avail organisations a more systemic disposition, providing diagnostic assessments of the organisation, monitoring inventory and strengthening the social fabrics of the organisation and its various stakeholders (Akter et al, 2016). Such conditions as necessitated by AI, ensure the steady flow of information to the organisation and place it at an advantage in terms of proactiveness and response to emerging threats or even latent opportunities (Akter et al, 2016). Knowledge or awareness of the situation, as Kogut and Mejri (2022) pointed out, enables a state of preparedness or strategic posture for events that may be unfavourable or unpleasant to the organisation. This is crucial as SMEs are less predisposed to the negative effects or impact of change on their businesses or operations. Another important feature of AI integration is that it supports system and functional integration, and as such, can be utilised in ensuring records are safely managed and services or functions are carried out from multiple locations. Such features are pertinent, especially in the event of flooding, riots or other disruptive conditions that may affect

the SME's operation in a particular location or context (Akinbami et al, 2019; Knight, 2019; Lee et al, 2019).

## **CONCLUSION AND RECOMMENDATIONS**

The integration of AI as advanced in this paper, enriches the competence and capacity of women entrepreneurs, enabling them to cope more effectively with the change outcomes in their environment or context of operation. In this vein, AI integration not only informs SMEs on the nature and tendencies of their context, it also equips them with the tools and structure for realigning their operations and ensuring their survival. The role of AI integration is therefore affirmed to be such that bolsters the SMEs ability to not only learn and prepare itself proactively for possible change events, but one that also reinforces the SMEs existing operational and functional capacity for change and effective recovery. To this end, AI integration can be considered essential in strengthening both learning and operational capacities for SMEs and can also be considered pertinent to the resilience, and thus, survival of women entrepreneurs within Nigeria. Following this position, the following recommendations are put forward:

- i. The adoption of AI and its integration within SMEs should begin with the assessment of its compatibility with the existing infrastructure and level of competence in the use and application of AI systems. This is imperative in ensuring that such integrations are sustainable, efficient and are in synchrony with the specific features of the SME.
- ii. The development of AI systems and their application should be structured in line with ethical policies and frameworks that guide its operations; ensuring compliance with ethical standards and effectively monitoring its use in the organisation. This is essential as it establishes trust and integrity in the management of the SME's data and confidential information about its clients or customers
- iii. AI integration should be specific to the type and nature of business of the SME. Such focus increases its level of efficiency and effectiveness in addressing the unique problems or challenges of the business. It is also imperative that such specificity take into consideration the environment or context of the business as well, especially its geographical, technological and legal conditions and factors.

## **REFERENCES**

- Acevedo-Duque, Á., Gonzalez-Diaz, R., Cachicatari Vargas, E., Paz-Marcano, A., Muller-Pérez, S., Salazar-Sepúlveda, G., Caruso, G., & D'Adamo, I. (2021). Resilience, leadership, and female entrepreneurship within the context of SMEs: Evidence from Latin America. *Sustainability*, 13(15), Article 8126.
- Adebiyi, J., Oyafunke-Omoniyi, C., & Adewusi, A. (2017). Women empowerment in Nigeria: A retro-structural examination. *Gender & Behaviour Journal*, 15(3), 9767–9785.
- Adepoju, O., Nwulu, T., & David, L. (2022). Evaluating the role of Nigerian bankruptcy law in enhancing female entrepreneurship in Nigeria. *Businesses*, 2(4), 396–409.

- Adetoyinbo, B. (2021). Nigeria, women outnumber men in business start-ups. *Harambee Today Pubs.* <https://harambeetoday.org/index.php/component/k2/item/1562-Nigeria-women-outnumber-men-in-business-start-ups>
- Agrawal, A., Gans, J., & Goldfarb, A. (2017, February 7). What to expect from artificial intelligence. *MIT Sloan Management Review.*
- Ajani, O. A., Gamede, B. T., & Mkhasibe, R. G. (2021). The impact of women entrepreneurs on national economic development in South Africa. *African Journal of Business and Economic Research, 16*(3), 73–91.
- Akinbami, C. A. O., Olawoye, J. E., Adesina, F. A., & Nelson, V. (2019). Exploring potential climate-related entrepreneurship opportunities and challenges for rural Nigerian women. *Journal of Global Entrepreneurship Research, 9*(1), 1–28.
- Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment. *International Journal of Production Economics, 182*, 113–131.
- Aladejebi, O. (2020). 21st-century challenges confronting women entrepreneurs in Southwest Nigeria. *Archives of Business Research, 8*(3), 261–280.
- Al-Omouh, K., Ribeiro-Navarrete, B., & McDowell, W. C. (2023). The impact of digital corporate social responsibility on social entrepreneurship and organizational resilience. *Management Decision.* Advance online publication.
- Anwana, E. O., & Aroba, O. J. (2022). African women entrepreneurs and COVID-19: Towards achieving the African Union Agenda 2063. *Hervormde Teologiese Studies, 78*(2), e1–e7.
- Anyansi, A. C. (2021). Challenges, opportunities, and interventions for women entrepreneurs. In *The foundation and growth of African women entrepreneurs* (pp. 45–68). Cham: Springer International Publishing.
- Atungwu, M. (2024). Flooding: Over one million persons affected in Nigeria - NEMA. Retrieved from <https://dailypost.ng/2024/09/13/flooding-over-one-million-persons-affected-in-nigeria-nema/>
- Bastida, M., Pinto, L. H., Oliveira Blanco, A., & Cancelo, M. (2020). Female entrepreneurship: Can cooperatives contribute to overcoming the gender gap? A Spanish first step to equality. *Sustainability (Basel, Switzerland), 12*(6), 2396.
- Bleijenbergh, I. L., Cacace, M., Falcinelli, D., Giorgio, E. d., & Declich, G. (2021). How Dutch and Italian women's networks mobilize affect to foster transformative change towards gender equality. *The European Journal of Women's Studies, 28*(1), 10–25.
- Bryson, J. J. (2018). AI ethics. *ACM SIGCAS Computers and Society, 48*(3), 48–54.
- Dash, B. M., Prashad, L., Singh, K. K., & Dash, M. (2020). Women and poverty in India: Poverty alleviation and empowerment through cooperatives. *Social Work & Society, 18*(2), 1-14.
- Gartner. (2021). *Predicts 2021: Artificial intelligence and its impact on people and society.* Gartner Research

- Ghouse, S. M., Durrah, O., & McElwee, G. (2021). Rural women entrepreneurs in Oman: Problems and opportunities. *International Journal of Entrepreneurial Behavior & Research*, 27(7), 1674–1695.
- Gupta, M. (2021). Role of NGOs in women empowerment: Case studies from Uttarakhand, India. *Journal of Enterprising Communities*, 15(1), 26–41.
- Halkias, D., & George-Ufot, D. (2021). Challenges of women micro-entrepreneurs in the Niger Delta region of Nigeria for business survival: A narrative inquiry. *The ISM Journal of International Business*, 4(1), 11–22.
- Jaiyeola, E. F., & Adeyeye, M. M. (2021). Obstacles along the path of women enterprises in Africa: A case study of Ogotun women in Ekiti State, Nigeria. *Heliyon*, 7(7), 1–7.
- Knight, W. (2019, October 15). What is explainable AI? *MIT Technology Review*.
- Kogut, C. S., & Mejri, K. (2022). Female entrepreneurship in emerging markets: Challenges of running a business in turbulent contexts and times. *International Journal of Gender and Entrepreneurship*, 14(1), 95–116.
- Korber, S., & McNaughton, R. B. (2018). Resilience and entrepreneurship: A systematic literature review. *International Journal of Entrepreneurial Behavior & Research*, 24(7), 1129–1154.
- Kozlenkova, I.V., Samaha, S.A. & Palmatier, R.W. (2014). Resource-based theory in marketing. *Journal of the Academy of Marketing Science*, 42 (1), 1-21.
- Lee, J., Suh, T., Roy, D., & Baucus, M. (2019). Emerging technology and business model innovation: The case of artificial intelligence. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 44.
- Lepri, B., Staiano, J., Sangokoya, D., Letouzé, E., & Oliver, N. (2017). The tyranny of data? The bright and dark sides of data-driven decision-making for social good. *Big Data & Society*, 4(2), 2053951.
- Manishimwe, T., Akahome, J. E., Uwagaba, J., & Danjuma, I. (2023). Against all odds: Women's motivation to become entrepreneurs. *Journal of Global Entrepreneurship Research*, 13(1), 21.
- Nautiyal, S., & Pathak, P. (2023). Resilience through the lens of entrepreneurship: A bibliometric analysis and network mapping of the emerging research field. *International Journal of Organizational Analysis*. Advance online publication.
- Pita, M., & Costa, J. (2021). Entrepreneurial resilience and gender: Are they connected? Contributions toward entrepreneurship policy-package. In *Advances in Entrepreneurship, Firm Emergence and Growth* (Vol. 367, pp. 621–631). Emerald Publishing Limited.
- Reim, W., Åström, J., & Eriksson, O. (2020). Implementation of artificial intelligence (AI): A roadmap for business model innovation. *AI*, 1(2), 180–191.
- Semmler, S., & Rose, Z. (2017). Artificial intelligence: Application today and implications tomorrow. *Duke Law & Technology Review*, 16, 85.



- Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2019). Impact of artificial intelligence on businesses: From research, innovation, market deployment to future shifts in business models. *arXiv preprint arXiv:1905.02092*.
- Utami, H., & Alamanos, E. (2023). Resource-based theory: A review. In S. Papagiannidis (Ed.), *Theory Hub Book*. Available at <https://open.ncl.ac.uk>. ISBN: 9781739604400
- West, D. M. (2018). *The future of work: Robots, AI, and automation*. Brookings Institution Press.