DIGITAL ENTREPRENEURIAL ECOSYSTEMS ASSESSMENT AND SUSTAINABILITY OF FASHION INDUSTRIES IN PORT HARCOURT RIVERS STATE, NIGERIA

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Abstract

This paper surveyed Digital Entrepreneurial Ecosystems Assessment and Sustainability of Fashion Industries in Port Harcourt, Rivers State, Nigeria. It identified the entrepreneurs as major contributors of the developing economy, like, Rivers State, Nigeria and also the need for an effective balanced between the three pillars of (economic, social and environmental) sustainability. The research design adopted was the survey design. A total of thirteen (13) registered fashion industries was considered based on their digital knowledge. The sample size of this research comprises of randomly selected sixty- nine (69) respondents from the population members, they are thirteen (13) managers, thirty-nine (39) other employees (workers), and twenty-six (26) apprentices. For effective and efficient data collection, the structured questionnaire was designed a on 5-point Likert's scale to collect data from the respondents. Out of the sixty-nine (69) questionnaires that was distributed to the various fashion industries, sixty (60) copies of the questionnaires that was proper completed was retrieved and used for data analysis. The general linear model (multivariate) analysis was used to test the hypotheses. The output of the analysis showed that, there was a linear relationship between digital entrepreneurial ecosystems assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria and that the implementation of big data analytics tool actually moderate digital entrepreneurial ecosystems assessment and the three pillars of organizational (economic, social and environmental) sustainability. Therefore, government and organization desiring to achieve full sustainability especially in the fashion industries should implement digital entrepreneurial ecosystem assessment with embedded big data analytics tool.

Keywords: Big data analytics tool, Digital entrepreneurial, Ecosystem, Assessment and Sustainability.

Introduction

Sustainability in the fashion industry is far more than just textile production, it encompasses the variety of stakeholders, ranging from contemporary producers and consumers to future producers and consumers (Sun, Bellezza & Paharia, 2021). It is the entire life cycle of how an item is produced, who produces it, and how long its life span is before it ultimately discarded and also, the negative impacts on the environment. It intent to reduce the carbon footprint gas emissions stemming from manufacturing and transportation. It aimed at reducing the environmental impact of fashion, including air and water pollution, which could prevent millions of premature deaths over the next century (Cao, Chang, Kallal, Manalo, McCord, Shaw & Starner, 2014). It is an effort to minimize the fashion's industry's adverse environmental and social impacts. It describes the industry's entire production, cotton growth, and wasteful fashion consumption patterns to landfilling, where so many clothes end up (Medcalfe & Miralles, 2022). In searching for the solution for this problem, digital entrepreneurial ecosystem assessment evaluates the environment in which digital

entrepreneurs operate, it examined factors such as digital infrastructure, talent and skills, funding and investment, regulatory environment and market opportunities.

The contribution of small business (fashion) enterprises in the developing economy cannot be over emphasized. Small enterprises are regarded as the core in any developing economy for their vital role they played in the society. They are the major agent for economic growth, self-employments, job creation, poverty reduction, innovative thinking and innovation (Adeosun & Shittu, 2021: Aikor2021). With the new internet of things (IoTs) today, cities are now closer, many sensors, cameras, analytics tools and lot of devices are integrated into the internet environment via Wireless Sensor Networks (Gisbert, Palau, Uriarte, Prieto, Palazón, Esteve, López, Correas, Lucas-Estan, Giménez, & Moyano, 2014). These changes provide opportunities for young entrepreneur, the opportunities include, to observe general business processes, improve the customer experience, saving time, and money, increasing speed, integrating and stimulating business models, making better business decisions and to more innovative and increase in profitability (Rahmani, Bayramov& Kalejahi, 2021). It enables easy mobilities, it enhances fast connection to market and research through the use of the application platform. It provides the opportunity for frequent network changes and routing strategies, dynamic IP allocation, and networking (Rahmani, Bayramov& Kalejahi, 2021).

The digital transformation of business and society has become imperative for innovation in all types of organizations, including firms, research centers, and government agencies (Joel, Oyewole, Odunaiya & Soyombo, 3024). Digitalization is actively shaping every industry and company as strategic adaptations and modifications to traditional business models are required to remain relevant and competitive (Ciasullo, Troisi, Miller & Maione, 2021). This has turned the world into a global village that fashion homes can easily access their potential customers (Al-dahabi, Algazo, Hajjaj, & Abukhait, 2024). The entrepreneurial ecosystem is a community of entrepreneur that exchange knowledge within their area of specialization, while big data analytics is an application installed within the community network, and used to carry out the systematic analysis to uncover pattern, correlations, and insights for effective business transaction and decision taking in an ecosystem (Rahmani, et al. 2021). The four types of analytics that can help the organization, society, or individual to make driven decision without making serious mistakes are descriptive analytics, tell us what happened, diagnostic analytics tell us why something happened, predictive analytics tell us what will likely happen in the future and prescriptive analytics tell us how to act (Taherdoost, 2020).

Sustainability as defined by the Brundtland World Commission on Environmental and Development (United Nations, 1987) is development that meets the needs of the presents without compromising those of the future. Fashion as a cyclical and temporary phenomenon that follows the economy, lifestyles, behaviours and trends of the society (Gazzola, 2020), the fashion industry employed more that 300 million people worldwide and represents a significant economic force, operating in an extremely competitive market (Gazzola, 2020). Despite these contributions it remains one of the most polluting industry that special concerned must be considered of its production processes. Sustainable entrepreneurship is considered an essential contributor to the transition to a sustainable economy. This includes entrepreneurial activities that include the economic, ecological, and social dimensions of sustainability as part of the core business model. One of the major defining features of entrepreneurial ecosystem research is the focus on productive entrepreneurship. Productive entrepreneurship has been defined as “any entrepreneurial activity

that contributes directly or indirectly to net output of the economy or to the capacity to produce additional output, this definition focuses on performance and productivity without considering the environmental factor (Baumol, 1990). These are some of the issues that necessitated this survey and the adoption of big data analytics as the moderating factor for entrepreneurial ecosystem assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

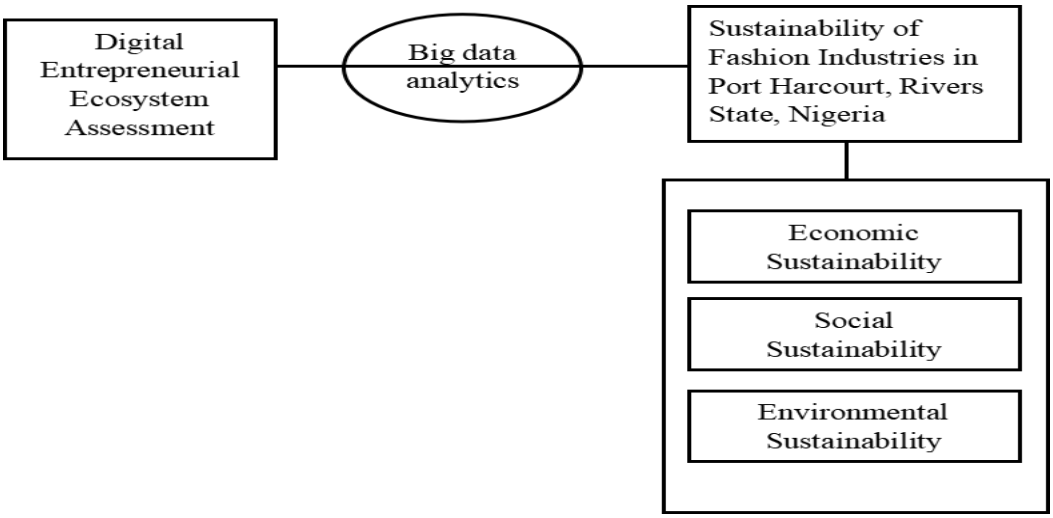


Figure 1: A Conceptual Framework of the relationship between Digital Entrepreneurial Ecosystem Assessment and Sustainability Of Fashion Industries in Port Harcourt, Rivers State, Nigeria

Source: (Subarna & Smys, 2021; Miake-Lye, Delevan, Ganz, Mittman & Finley, 2020; Elkington, 1994)

The general objective of this study examined the relationship between digital entrepreneurial ecosystem assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria and the moderating role of big data analytics between the independent and the dependent variables. The study will specifically examine; how digital entrepreneurial ecosystem assessment enhance the sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria and how big data analytics moderate digital entrepreneurial ecosystem assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

Literature Review

Theoretical Foundation

The paper anchored on the Dynamic Capability View theory. The Dynamic capabilities theory proposed by Teece and Pisano (1994) is the extension from resource-based view (RBV) of the firm (Barney, 1986, 1991) The DCV emerged as a theoretical extension of the Resource-Based View (RBV) to explain how firms manage to remain competitive in the long run within turbulent environments (Ambrosini & Bowman, 2009). Following the original philosophy of the RBV, an organisation's success depends on the availability and orchestration of valuable, rare, inimitable and non-substitutable assets, which enable the implementation of value-creating strategies capable to generate rents (Barney, 1991). Specifically, a

company can obtain a sustainable competitive position by acquiring and controlling the resources perceived as strategic and consequently developing firm-specific capabilities that are highly dependent on the types of resources accumulated (Makadok, 2001). More recently, the literature has highlighted how the static approach adopted by the RBV falls short of explaining how firms utilize their resources and capabilities in dynamic markets, thus paving the way for the diffusion of the DCV (Priem & Butler, 2001). DCs can be defined as "the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments" (Teece, Pisano & Shuen, 1997). According to Prescott (2014), competitive advantage is at risk if companies fail to adapt the tangible and intangible resources available to the newest changes and requirements of the external environment, which otherwise accelerate their transformation into core rigidities.

Conceptual Review

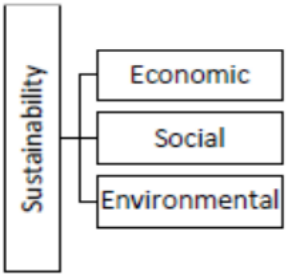
Digital Entrepreneurial ecosystem Assessment

Entrepreneurial readiness is the willingness of an individual to assume risk-taking activities based on their acquired knowledge, skills and abilities (Olugbola, 2017). It enables them to assume innovation-related risks based on the knowledge, skills and abilities they possess (Miake-Lye, Delevan, Ganz, Mittman & Finley, 2020). The mechanism of big data analytics plays a foundational role in the improvement of entrepreneurial readiness; the entrepreneurial abilities and expertise increase the willingness that enhances the readiness regarding potential changes in the business environment (Al-Najran, & Dahanayake, 2015). Entrepreneurship is a profitable process, and can promote economic and social development. It enables successful startups; this has a significant impact on the startup ecosystem. A startup's success largely depends on its ecosystem; the supportive environment it creates. The digital entrepreneurship ecosystem is a network of individualities, associations, and technologies that support and help grow digital entrepreneurship. Since ecosystems can grease the integration of coffers and supporting rudiments outside the enterprise position, digital entrepreneurship ecosystems are critical to the success of digital entrepreneurship. Explore key aspects such as motivation, cultivating and disseminating knowledge, experimenting with business models, building a team and providing specialized human resources. identify components of the entrepreneurial ecosystem, with a focus on digital fashion firms as a series of user-driven entrepreneurial activities. and agents.

Sustainability of fashion firms in Rivers State, Nigeria

Production, manufacturing and sustainability is a complex subject in business. It is difficult for a business man or woman to think about sustainability against profit because the main purpose any business venture is to make profit. Sustainability means how the society will meet their present needs without compromising future generation's ability to meet their own needs (Niessen & Bocken, 2021). The concept of economic sustainability in the business context means how businesses can meet their present needs without compromising future generations' ability to meet their own needs (Niessen & Bocken, 2021). Manufacturing organizations are pushing to make profit without considering effect on the future consumers and the society especially in the oil producing area, the excessive extraction of natural resources requires a revisited approach to responsible consumption and production (Niessen & Bocken, 2021). The concept of sufficiency, which advocates meeting human needs within the planetary limits by curbing excessive

consumption levels, is gaining increasing attention, businesses are drivers of consumption, yet they have been largely overlooked as potential leaders towards a sufficiency-based economy and research on businesses driving sustainable consumption, strategically is still a niche (Niessen & Bocken, 2021). Unsustainable consumption and production patterns have been one of the greatest challenges over the past few years. It is one of the main drivers of triple planetary crises of climate change, biodiversity loss and pollution, threatening human lives, environment and disrupting the targets of Sustainable Development Goals (SDGs, Sustainability transformation (Arota & Mishra, 2023). According to Arota and Mishra (2023), transition towards sustainable consumption and production will reduce negative impacts on climate, environment as well as on consumption and production which will directly affects people's health, this is a pre-requisite to achieve green economy. Brazil holds this position as a major food producer for its population and the world with a unique focus on nature and human capital valuation (Palhares, Morelli & Junior, 2017). Irresponsible consumption and production will lead to environmental degradation and production migration, with environmental, social and economic conflicts (Palhares, Morelli & Junior, 2017). A common misunderstanding about sustainable consumption is that it always implies reducing current consumption levels, or lowering the standard of living. In developing countries, this is interpreted as conflicting with the need for poverty eradication and continued economic growth (Palhares, Morelli & Junior, 2017).



Source: Brundtland (1987)

Figure 2: Triple Bottom Lines (TBLs)

The Triple Bottom Lines (TBLs) model of sustainability was proposed on par with the 3Ps; People, Planet, and Profit. The TBLs are commonly identified as the key dimensions of sustainability (Elkington, 1994). They intend to measure the economic, social and environmental aspects of any entity to assess sustainability.

Big Data Analytics

The process of making sense of something is called analysis, and the process of making sense of the data that is available is called data analytics. The management of data, which includes the gathering and storing of said data from a variety of sources, as well as the utilization of procedures, tools, and techniques to evaluate said data, is at the heart of this area of study. By analyzing data and making inferences from it, the purpose of data analytics is to derive correlations, obtain insights, and locate patterns. These actionable

insights not only help firms with the decision-making process, but they also help with generating predictions and boosting efficiency (Marchena Sekli & De La Vega, 2021). The demand for big data solutions is propelled by businesses' growing need to manage and process vast amounts of data in real-time while simultaneously enhancing their ability to make data-driven decisions. Big data and business analytics intentions to assist businesses in gaining insights into their customers and target markets, leading to better marketing efforts. These functionalities are anticipated to drive the adoption of big data solutions in various industries, further accelerating the progress of the big data market (Baig, Shuib, & Yadegaridehkordi, 2020). Data analytics is transforming the way organizations operate, enabling them to make better-informed decisions based on data-driven insights. By analyzing society needs, for example, government can identify the people's needs, preferences, and behaviors, enabling them to develop more effective implementation of strategies. Analytics is being used to identify patterns in patient data, enabling healthcare professionals to make more accurate diagnoses and provide more personalized treatment. The availability of vast amounts of data has raised questions about data privacy and security (Sonavane, 2021). Big Data is not just for well-established businesses with large budgets. It enables data accessibility and improved analytics revolution, creating opportunities for new companies and existing SMEs to harness the power of digital data. However, SMEs face challenges in adopting big data analytics, including resource constraints and lack of understanding of the concept (Singh, Singh, Rehmani, Kumari, & Varshini, 2024).

Several studies have linked IT failure to management issues such as a lack of business collaboration on IT abilities, expertise to incorporation of technology into business plan, and how to find and educate trained technical employees to use the BDA (Loh, Teoh & Keni, 2021). The Data Analytics is an appropriate lens to examine business analytics utilization (Subarna & Smys, 2021). Big Data is a very difficult concept to define precisely, since the very notion of big in terms of volume of data varies from one area to another. It is not defined by a set of technologies, on the contrary, it defines a category of techniques and technologies. This is an emerging field, and as we seek to learn how to implement this new paradigm and harness the value, the definition is changing (Nejjari & Aanoum, 2021). There are racially four types of big data analytics; descriptive analytics, diagnostics analytics, predictive analytics and prescriptive analytics (Dick, 2023).

Digital entrepreneurial ecosystems assessment and Sustainability fashion industries

Sustainability-oriented decision-making requires adequate information and dedicated information technology support (De Paula, De Paula & Oliveira, 2024). Therefore, integrating economic, social and environmental information requires a new understanding of how data is collected and shared among stakeholders (Sawle, Gupta & Bohre, 2018). The quality of sustainable information depends on the capabilities to collect and analyze large-scale data, while the potential benefits of digital technologies and sustainability have been widely publicized in the cutting-edge literature, little is known about the analytical capabilities of big data and sustainable information (Come- Zebra, van der Windt, Nhambiu, Golinucci, Gandiglio, Bianco & Faaij, 2024). Big data analytical capabilities are substantive for sustainable information quality (Come- Zebra, van der Windt, Nhambiu, Golinucci, Gandiglio, Bianco & Faaij, 2024). It brings benefits to support entrepreneur ecosystems assessment by enhancing sustainable information quality in emerging markets. Using big data analytic support enables the digital entrepreneur to assume innovation to overcome related risks based on the knowledge skills and abilities possessed (Miake-Lye,

Delevan, Ganz, Mittman & Finley, 2020). We therefore propose the following null hypotheses to answered the research questions as follows;

H_{01}: There is no significant relationship between digital entrepreneurial ecosystem assessment and economic sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

H_{02}: There is no significant relationship between digital entrepreneurial ecosystem assessment and social sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria

H_{03}: There is no significant relationship between digital entrepreneurial ecosystem assessment and environmental sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria

H_{04}: Big data analytics does not moderate digital entrepreneurial ecosystem assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

Empirical Review

Singh, Singh, Rehmani, Kumari, & Varshini (2024), The Role of Data Analytics in Driving Business Innovation and Economic Growth. A Comparative Study Across Industries. The in-depth analysis of big data analytics for SMEs revealed both the immense potential and the challenges faced by smaller businesses in adopting these technologies. Loh, Teoh & Keni (2021). Overcoming Entrepreneurial Challenges with Big Data Analytics Adoption to Accelerate Economic Recovery: Evidence from Malaysian Small Medium Enterprises. BDA adoption has been a proven strategy that can be utilized by entrepreneurs in riding the wave of entrepreneurial challenges today. Integrating organizational capabilities and BDA adoption drive prospective businesses to accelerate economic recovery via sustainable organizational performance

Bekkouche, L. (2020). Big data analytics for entrepreneurial orientation: Concepts, challenges and applications. Big data analytics (BDA) helps organizations reduce costs, make products faster, and create new products or services to meet customers' changing needs. Data analytics in the big data era has stimulated entrepreneurship and the rise of data entrepreneurs, resulting in major changes in entrepreneurship among firms.

Ertz, M., Latrous, I., Dakhlaoui, A. & Sun, S. (2024). The impact of Big Data Analytics on firm sustainable performance. The affirmed that public policy makers should encourage firms to invest in human capital internally because skilled employees are not only instrumental in making the digital transition successful and contribute to firm profitability, but also spur organizations' social realizations. In sum, investing in the social component internally has positive effects on external social components while contributing also meaningfully sustainability. Consequently

Alzboun, N. M. (2023). Big data analytics capabilities and supply chain sustainability: Evidence from the hospitality industry. Big data analytics helps collaborating with stakeholders on initiatives related to sustainability and corporate social responsibility, such as government agencies, industry groups, and consumers. Ikhsan A. F. & Arief M. (2023). Decision Making Performance of Big Data Analytics Capabilities: The Mediating Effect of Co-Collaboration. The application of big data in organizations is undisputable collaborating effort to improve organizational decision-making

Methodology

This study adopted the survey research design. The population of the study comprised of thirteen (13) registered fashion industries operating Port Harcourt, Rivers State, Nigeria. A sample of sixty-nine (69) respondents was randomly selected from the population members. As an empirical study, data was collected from the respondents with the aid of structured questionnaire designed on a 5-point Likert's scale. This enabled the researchers to carryout the univariate and multivariate analysis and the necessary data presentation with the help of statistical tool (statistical package for social science, SPSS), the descriptive was used to determine the mean and standard deviation and parametric statistics, general linear model (multivariate) analysis was used to test the relationship between the independent and the dependent variables and the moderating role of big data analytics.

Data Analysis and Reporting

Table 1: **Tests of Between-Subjects Effects**

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Economic Sustainability	88.220[a]	1	88.22	312.380	.000	.843
	Social Sustainability	91.754[b]	1	91.75	320.995	.000	.847
	Environmental Sustainability	112.928[c]	1	112.92	974.459	.000	.944
Intercept	Economic Sustainability	7.290	1	7.29	25.812	.000	.308
	Social Sustainability	6.597	1	6.59	23.079	.000	.285
	Environmental Sustainability	12.459	1	12.45	107.505	.000	.650
Big Data Analytics	Economic Sustainability	88.220	1	88.22	312.380	.000	.843
	Social Sustainability	91.754	1	91.75	320.995	.000	.847
	Environmental Sustainability	112.928	1	112.92	974.459	.000	.944
Error	Economic Sustainability	16.380	58	.282			
	Social Sustainability	16.579	58	.286			
	Environmental Sustainability	6.722	58	.116			

Table 1: **Tests of Between-Subjects Effects (continue)**

Source	Dependent Variable	Type III SumDf of Squares		Mean Square	F	Sig.	Partial Eta Squared
Total	Economic Sustainability	542.000	60				
	Social Sustainability	590.000	60				
	Environmental Sustainability	607.000	60				
Corrected Total	Economic Sustainability	104.600	59				
	Social Sustainability	108.333	59				
	Environmental Sustainability	119.650	59				

a. R Squared = .843 (Adjusted R Squared = .841)

b. R Squared = .847 (Adjusted R Squared = .844)

c. R Squared = .944 (Adjusted R Squared = .943)

Source: Research survey, 2025

Table 1 showed that digital entrepreneurial ecosystem assessment enhanced the effective and efficient sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria. The correlation was significant at (p = 0.00) less than the 95% level of freedom of (0.05). The Patial Eta Squared showed that the implementation of digital entrepreneurial ecosystem assessment with inbuilt big data analytics tool enhanced the synchronous correlations with economic sustainability of 0.843, social sustainability of 0.847 and environmental sustainability of 0.944 respectively. See the various predicted and observed graph in figure 3, 4 and 5 below.

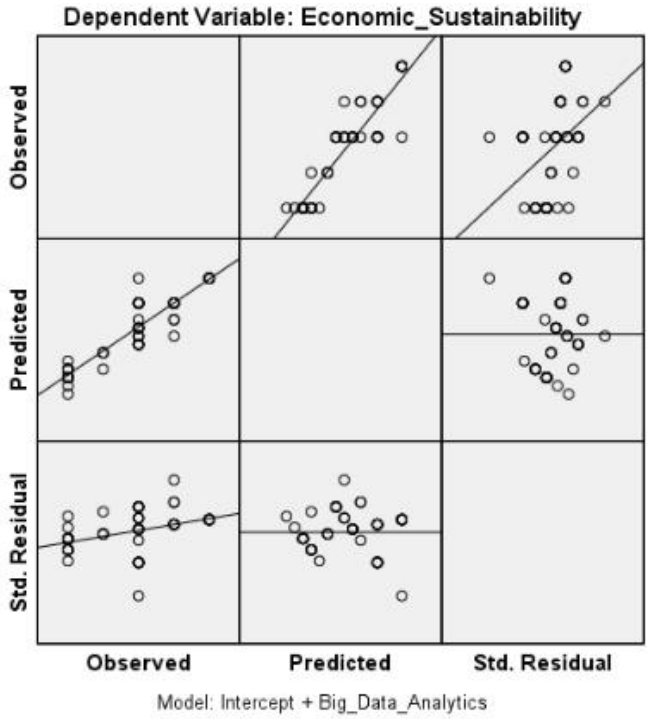


Figure 3: Big data analytics and economic sustainability

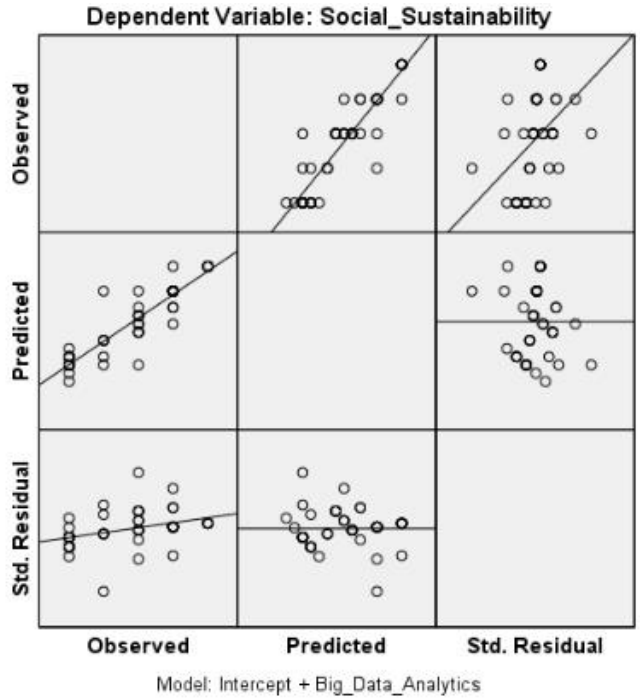


Figure 4: Big data analytics and Social Sustainability

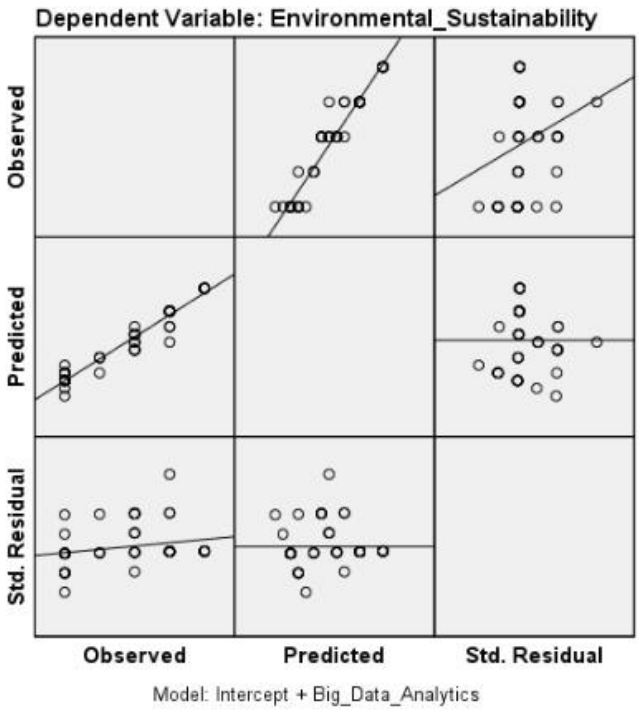


Figure 5: Big data analytics and Environmental Sustainability

Conclusion and Recommendations

The fashion industries contribute greatly to the economic development of any nation. They create opportunities for greater proportion of the society in terms of wealth creation and job opportunities. Inspite of its contribution, there is the need to ensure the balanced of the economic, social and environmental sustainability. Understanding the nature of the industry and the effect of the text materials on the ecosystem is a major concern. This can only be done with the implementation of digital entrepreneurial ecosystem assessment that is capable of analysis the properties of the textile material, follow proper manufacturing process, ensure proper consumption and disposal and the effective integration of the Rivers State fashion industries into the global market. Digital entrepreneurial ecosystem assessment with aid of big data analysis tool is an effective method for enhancing the sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria in terms of economic, social and environmental sustainability.

The effective implementation of digital entrepreneurial ecosystem assessment with embedded big data analytics tool is a sure way for fashion industries sustainability is Rivers State, Nigeria. Therefore, we recommended as follows, that;

1. Digital entrepreneurial ecosystem assessment should be implemented to enhance economic sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

2. Digital entrepreneurial ecosystem assessment should be implemented to enhance social sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.
3. Digital entrepreneurial ecosystem assessment should be implemented to enhance environmental sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.
4. Big data analytics tool should be adopted to moderates digital entrepreneurial ecosystem assessment and sustainability of fashion industries in Port Harcourt, Rivers State, Nigeria.

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