Financial Management Information Designs and Product Innovations Sustainability in Developing Economy-Using Ambidexterity Model

Adesola Adebayo Akande, Olusayo Rotimi-Bimbo, Toyon Ebitei Robert

Elizade University, Ondo State, Nigeria

DOI: https://dx.doi.org/10.47772/IJRISS.2024.807141

Received: 17 May 2024; Accepted: 05 June 2024; Published: 11 August 2024

ABSTRACT

This study used Ambidexterity Model to determine the correlation between Financial Management Information Designs (FMID) and product innovation sustainability (PIS) in developing nations using Nigeria as a case study. Data collected from 200 industrialists representing a range of characteristics from industrial sector were analyzed using regression analysis method. Variables considered (FMID) includes Management Information System (MIS), Customer Capability (CC), Information Quality (IQ), User Satisfaction (US), and Financial Security Privacy (FSP). The results indicates that FMID has a significant effect on product innovation sustainability in the developing countries, fostering collaboration and utilization of financial data, enabled agile decision-making, thereby establishing a favourable atmosphere for product innovations sustainability. The study concluded that obstacles that are often encountered includes resource scarcity and infrastructure deficiencies. Based on this, scholarly contribution situating the influence of FMID on product innovation sustainability in various socioeconomic contexts were made thereby offering practical recommendations for policymakers, top managers in manufacturing industries and improvement of strategies for designing a viable and sustainable financial management information, encourage international cooperation, and stimulate product innovation across various socioeconomic environments.

Keywords: FMID, MIS, Customer Capability, Information Quality, User Satisfaction, Security Privacy

INTRODUCTION

From a global point of view product innovation and the intersection of financial management information designs constitute a crucial area that need explorative and sincere modelling to break the yok of redundancy and stagnation that are unconsciously practiced in our industries especially in developing nations across the globe. In designing a suitable and result oriented Financial Information System (FIS), six main components become germane which are: workforce of the organization, designed procedures, available financial data, accounting software, information technology infrastructure and internal control. The global business environment is presently characterized by swift technological progress and expanding digital integration, across the globe and as such coming to understand the criticality of harnessing advanced financial management information systems as a catalyst for innovation becomes essential (Chibuike Daraojimba et al., 2023; Haaland et al., 2021).

The worldwide outlook highlights a consistent transition towards making decisions based on data and integrating information technologies strategically to improve the processes of product development (Kozludzhova, 2023). This phenomenon is conspicuous in numerous industries, ranging from manufacturing and services to technology and healthcare. This signifies a widespread recognition of the significance of financial management information systems and its designs to meet up with the innovation needs and

sustaining a competitive edge (Larisa & Tatiana, 2022; Supriyono et al., 2023).

Developed nations have set the ball rolling, many financial management designs have been on course. In Asia, most financial management system are characterized by a strong emphasis on financial management information designs and product innovation, especially in manufacturing and technology-intensive economies. Prominent nations such as Japan, China, and South Korea have spearheaded the incorporation of the sophisticated information systems into their financial management approaches to product designs and development (Gozali et al., 2021). The Asian context is distinguished by substantial investments in research and development (R&D), robust governmental backing for technological innovation, and a cultural inclination towards perpetual enhancement financial system and technological prowess (de Moraes et al., 2019).

Consequently, Asia has emerged as a prominent center for technological innovation on a global scale, as organizations utilize modern financial management information systems to optimize processes, improve product excellence, and expedite the launch of novel products into the marketplace (Brown & Eisenhardt, 1995).

Ambidexterity model become essential in the case of developing nations to achieved a balanced exploration and exploitation, which allows the industries to be creative and adaptable to new financial management designs, while also continuing to rely on more traditional, proven methods of business Management.

Concerning the implementation and influence of financial management information system designs on product innovation, Europe offers a varied terrain. As a result of the European Union's emphasis on digital transformation and innovation, businesses throughout the continent have adopted sophisticated information systems (Jabar et al., 2011). An increasing number of European businesses are placing a premium on product innovation driven by data analytics, artificial intelligence, and cloud computing without compromising the quality and value delivery as adequate as possible.

The utilization of Financial management information designs (FMID) undoubtedly stimulates product innovation as a critical determinant of economic expansion and competitiveness, but it has not been properly propagated in developing nations particularly in Nigeria,. Notwithstanding obstacles such as financial limitations and inadequate infrastructure, African countries and Nigerian enterprises are to progressively acknowledge the significance of this designs to augment product innovation (Quaye & Mensah, 2019). Utilising mobile technologies, digital platforms, and data analytics to surmount logistical obstacles and meet the demands of the local market which are the primary weapon used by developed industries to cart away the wealth of nations in developing nations.

The potential of financial management information systems stimulates innovation in emergent markets, particularly in Nigeria and Africa where this is grossly underscored by the transformative impact that technology can have in tackling socio-economic issues (Santoso et al., 2022). The significance of Financial management information designs in fostering product innovation in various economic environments cannot be underestimated in this global overview and as such, the strategic incorporation of the financial information systems is crucial for promoting economic growth and enhanced competitiveness across various regions, including the emerging markets of Africa and Nigeria hence this study harness the collaborative innovation ecosystems of Europe and the technologically advanced landscapes as an essential tools for product innovation sustainability in Nigeria.

THEORETICAL REVIEW

The burgeoning technology that start-up ecosystem in Nigeria serves as an indication of an increasing focus on digital innovation that deserves a new design of financial management system for sustainability and

productiveness of goods and services. Many organization are employing new financial management information designs to create products that specifically address the demands of the African market (Rasool et al., 2023).

Financial Management Information System

A well-functioning financial management information system (FMIS) provides timely, reliable, and comprehensive reports that support implementation of the fiscal policies and fiscal rules, in the formulation, controlling, monitoring, and executing of a business entity's budget (Gerado et al, (2019). The architecture of FMISs has undergone a transformation since these systems were first developed in the 1980s. Rather than attempting to cover all or most public financial management (PFM) functions, many FMISs now focus on a few core functions such as accounting and reporting, budget execution, and cash management. According to Gerado et al, (2019) severe challenges were faced in transforming their FMIS into an effective tool of fiscal governance. These challenges relate to weaknesses in the system's core functions, its institutional coverage, the information technology platforms it uses, and the ease of sharing data with other IT systems. The challenge that has been overcome then is what the industries and government is spending huge amount to achieve, thus looking for a way of replacing a FMIS with an entirely new system that may not be an optimal strategy hence there is a strong need to design a suitable one that will enhance optimal results using ambidexterity model.

Management Information Designs (MID)

MID constitutes the comprehensive process of organising, designing, and integrating a sound financial information system in a strategic manner for the benefit of the organisation. Its primary objective is to improve operational efficiency and decision-making processes by ensuring that information is readily available and flows efficiently (Santoso et al., 2022).

MID is an interdisciplinary undertaking that necessitates the strategic organisation of content and presentation of environmental optimization of the effectiveness of information. This requires an in-depth comprehension of the information's consumption as well as its organisational and social contexts (Peffers, 2006; Rasool et al., 2023).

The significance of MID in fostering innovation is emphasised by its ability to streamline the integration and examination of various data sources, allowing businesses to detect market trends, opportunities, and challenges ((Knudsen et al., 2023; Xiao & Bharadwaj, 2023)). MID additionally facilitates the cooperative endeavours of cross-functional teams through the provision of a unified platform for the exchange of information and communication.

Products Innovation (PI)

Product innovation pertains to the launch of a novel or substantially enhanced product or service in terms of its attributes or designated applications (Rasool et al., 2023; Sonmez Cakir et al., 2023). This encompasses substantial improvements in technical specifications, materials, components, software integration, usability, or other functional attributes.

Product innovation can be classified into three primary categories:

The introduction of new product features,

Incremental enhancements to existing products and,

New product innovation.

The importance of product innovation resides in its capacity to stimulate business expansion, distinguish organisations in the marketplace, and cater to changing consumer demands

Achieving successful product innovation necessitates a methodical procedure that incorporates ideation, concept refinement, and market entry (Chibuike Daraojimba et al., 2023; Supriyono et al., 2023).

Financial Management System Design and Product Innovation

An essential field of study is the interaction between Product Innovation and Financial Management Information Design serves as the informational foundation for innovation processes, FMID empowers businesses to utilise data analytics and insights in the creation of new products (Knudsen et al., 2023; Mertens et al., 2023). Product innovation efforts are crucially guided by the identification of customer requirements and market gaps, which is made possible by effective FMID practices.

Furthermore, FMID has the potential to optimise the efficiency and efficacy of product innovation procedures through the facilitation of streamlined communication, promotion of stakeholder collaboration, and acceleration of new product concept prototyping and testing (Xiao & Bharadwaj, 2023).

Within this particular framework, FMID functions as a catalyst for product innovation, granting organisations the ability to navigate the intricacies of the innovation environment and introduce new products to the market with greater efficiency (Konur & Alkan, 2021; Rasool et al., 2023).

The critical significance of Financial Management Information Design and Product Innovation in propelling organisational achievement is underscored in many conceptual review. FMID functions as an essential component that underpins the process of innovation, whereas PI symbolises the concrete result of these endeavours (Sonmez Cakir et al., 2023). The interdependence of FMID and PI is critical in cultivating an environment that promotes innovation, thereby empowering businesses to maintain their competitive edge and adapt to changes in the market. Subsequent investigations ought to delve deeper into the mechanisms by which FMID impacts PI and ascertain optimal approaches for incorporating these constructs into organisational strategies (Larisa & Tatiana, 2022).

THEORETICAL FRAMEWORK

In comparative analysis between developed and developing nations, the research on the effect of management information designs on product innovation can be substantiated by two well-known theories from the field: the Knowledge-Sharing Ambidexterity Theory and Organisational Change Theory.

Knowledge-Sharing Ambidexterity Theory

The Knowledge-Sharing Ambidexterity Framework asserts that in order for organisations to attain innovation, particularly with inter-organisational systems, a harmonious equilibrium between knowledge exploration and exploitation is necessary (Kozludzhova, 2023; Mertens et al., 2023). According to this framework, opportunities for collaborative innovation in products and services can be identified considerably more effectively when organisational structures and management practices facilitate partner-to-partner exploration and exploitation (Santoso et al., 2022). The framework supports the notion that effective management information designs can foster an environment where internal and external knowledge are utilised to innovate products, within the context of this study (Kozludzhova, 2023). This is especially pertinent in developing countries, where limited resources may force businesses to rely more heavily on

collaborative innovation.

Organisational Change Theory

The Organisational Change Theory places significant emphasis on the imperative for business leaders to consciously modify processes, organisational designs, and technology utilisation in order to capitalise on digital innovations (Kozludzhova, 2023). This theory emphasises the value of organisational adaptability and a readiness to allocate resources towards information systems (IS) that foster collaboration, learning, and innovation. Within the framework of the research, this theory provides support for the proposition that organisations must implement substantial modifications to their operations, encompassing information management and utilisation, in order to effectively capitalise on product innovation (Knudsen et al., 2023). In both developed and developing countries, where integrating new technologies and adapting to swiftly shifting market demands are formidable obstacles, this is of the utmost importance (Mertens et al., 2023; Rasool et al., 2023). The significance of management information designs in promoting product innovation is emphasised by both theories. Effective information management is crucial for utilising both internal and external knowledge, according to the Knowledge-Sharing Ambidexterity Framework. Organisational change theory emphasises the necessity for organisations to be adaptable and to utilise IS strategically in order to foster innovation. Collectively, these theories establish a strong conceptual framework for investigating the impact of management information designs on product innovation in various economic environments (Kozludzhova, 2023; Xiao & Bharadwaj, 2023).

Financial management information design with Ambidexterity model has an interface to anchor both the existing principles of financial management and those imported with recent ages technology to achieve the desired objectives of product innovation and its subsequent sustainability. The effectual creativity resulting into a sustainable product innovation in an environment where people – customers and policy Formulators allow the principles created to work effectively. In the figure above, the components of FMID are utilized to achieve the desired product innovation.

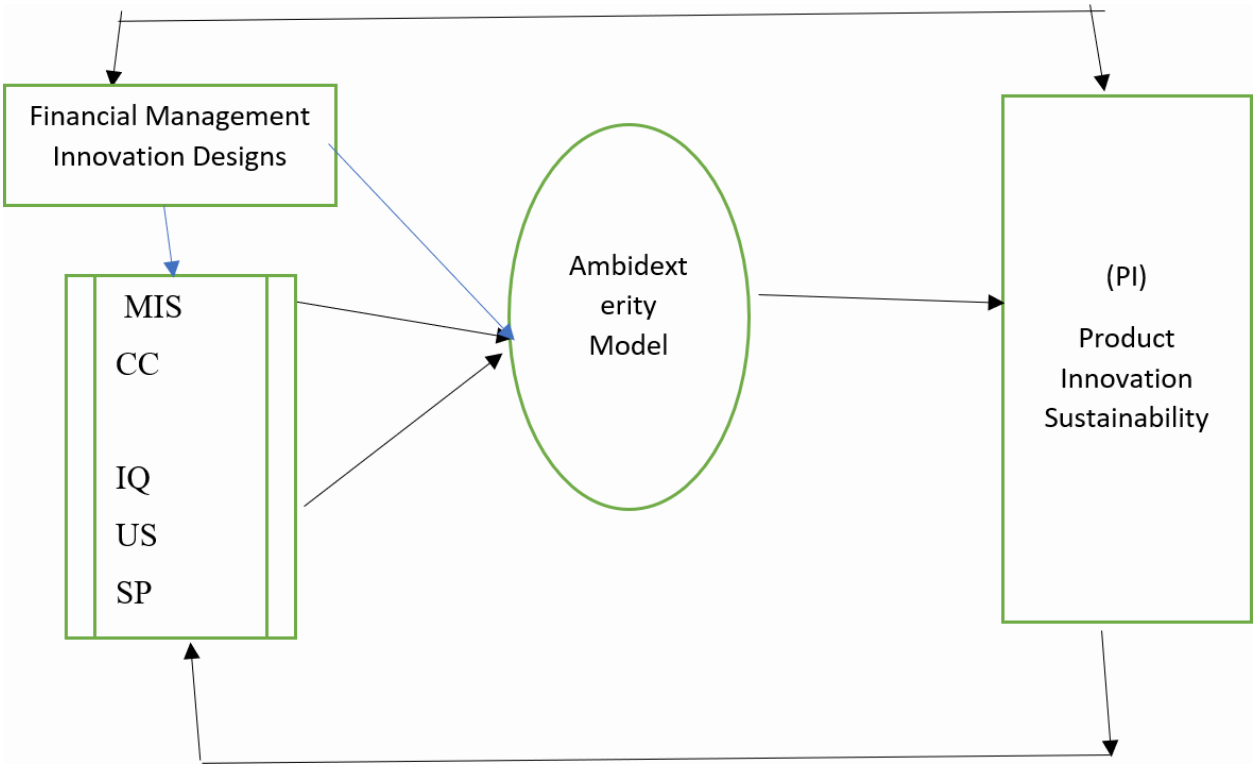

Fig. 1. Regression Model

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue VII July 2024

Y = Product Innovation

X = Financial Management Information Designs

X1 = MIS = Management Information System

X2 = CC = Customer Capability

X3 = IQ = Information Quality

X4 = US = User Satisfaction

X5 = SP = Security and Privacy

METHODOLOGY

By utilising a quantitative survey research design, this study investigates the effect that financial management information designs (FMID) have on product innovation in both developing countries. The study utilised stratified random sampling to select 200 firms from diverse industries, with the intention of obtaining a representative sample. This approach ensures that the sample is both diverse and proportionate across economic contexts.

A structured online questionnaire comprising closed-ended and Likert-scale inquiries was employed to gather comprehensive data regarding the product innovation endeavours and FMID of the organisation. Prior to administration, the questionnaire undergoes clarity and dependability checks. All respondents were guaranteed confidentiality, and participation was entirely voluntary. Statistical analysis was performed utilising SPSS software. Descriptive statistics are employed to provide an overview of the attributes of the sample. In contrast, inferential statistics, including regression analysis, examine the correlation between FMID and product innovation, taking into consideration the economic conditions of the countries under comparison (Krijnen, 2023).

Data Presentation and Discussion of Result

Table 1 Demographic Information of Respondents

		Frequency	**Percent**
Age	Below 25	8	4.0
	25-35	61	30.5
	36-45	55	27.5
	46-55	44	22.0
	Above 55	32	16.0
	Total	**200**	**100.0**
Gender	Male	106	53.0
	Female	94	47.0
	Total	200	100.0
Educational Qualification	Undergraduate	3	1.5
	Bachelor's Degree	25	12.5
	Master's Degree	67	33.5

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VIII Issue VII July 2024

	Doctorate Degree	101	50.5
	Others	4	2.0
	Total	200	100.0
Size of Organisation	Less than 20	41	20.5
	20-25	71	35.5
	26-30	45	22.5
	Above 30	43	21.5
	Total	200	100.0
Industry/Sector	Technology	37	18.5
	Manufacturing	50	25.0
	Agric	28	14.0
	Services	22	11.0
	Fashion	22	11.0
	Others	41	20.5
	Total	200	100.0
Country	Developed Nation	76	38.0
	Developing Nation	124	62.0
	Total	200	100.0

Source: Research Filed Survey, 2024

The result of the Demographics information in Table 1 is presented as follows:

Distribution by Age: A significant proportion of the participants are aged between 25 and 35 (30.5%) and 36 and 45 (27.5%). Around 16% of the participants are aged 55 or older, whereas 4% are under the age of 25. The observed distribution indicates that various age categories are comparatively well-represented, albeit with a marginally greater percentage of younger adults.

The Distribution of Gender: Out of the total sample, 47% are females and 53% are males.

The sample exhibits a comparatively equitable distribution of genders. A significant proportion of the participants possess either a Doctorate degree (50.5%), or a Master's degree (33.5%). The smallest category, comprising 1.5%, consists of individuals with undergraduate qualifications, whereas bachelor's degree holders constitute 12.5%. The sample exhibits a skewness in favour of individuals with higher educational attainment, as a considerable percentage of respondents possess advanced degrees.

Most respondents are employed by companies with 20–25 members of staff (35.5%) or fewer than 20 members (20.5%). Organisations comprising 26-30 employees account for approximately 22.5% of the sample, while those with 30 or more employees account for 21.5%. The data suggests that there is considerable representation in tiny and medium-sized organisations, although the distribution reveals a diverse range of organisation sizes.

The manufacturing sector is the most heavily represented at 25%, followed by technology at 18.5% and agriculture at 14%. The services and fashion industries each account for 11% of the total, whereas the remaining 20% is comprised of other sectors. The sample comprises individuals from various sectors, including manufacturing and technology, where they are significantly represented. While 38% are from

established nations, 62% of the respondents are from developing countries. The sample comprises a greater proportion of individuals from developing countries.

Regression Analysis

Table 2 Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error Estimate
1	.542[a]	.293	.275	.65979
a. Predictors: (Constant), MIS, CC, IQ, US, SP				
b. Product Innovation				

Source: Researcher's Field Survey, (2024)

Summary of the Regression Model in Table 2, The results of the regression analysis indicate that Product Innovation is moderately associated with the predictors (MIS, CC, IQ, US, SP) (R = 0.542), accounting for 29.3% of the variance (R Square = 0.293). The adjusted R Square, which takes into consideration the number of predictors in the model, provides an explanation for variance of 27.5%.

Table 3 Regression showing the significance of each predictor to Product Innovation

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35.062	5	7.012	16.109	.000[b]
	Residual	84.453	194	.435		
	Total	119.515	199			
a. Predictors: (Constant), MIS, CC, IQ, US, SP						
b. Product Innovation						

Source: Researcher's Field Survey, (2024)

Significance of Regression (Table 3), The results of the regression analysis demonstrate statistical significance ($F = 16.109$, $p < 0.001$), suggesting that the predictors as a group exert a substantial influence on Product Innovation.

Table 4 Contribution of each predictor to Product Innovation

Model		Unstandardized Coefficient		Standardized Coefficient	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.310	.390		3.356	.001
	MIS	-.044	.060	-.052	-/740	.460
	CC	-.122	.066	-.127	1.830	.069
	IQ	.303	.068	.293	4.444	.000
	US	.082	.065	.086	1.258	.210
	SP	.426	.081	.344	5.242	.000

Source: Researcher's Field Survey, (2024)

The Predictors' Contribution (Table 4), The standardised coefficient for Information Quality (IQ) is the highest at 0.293, suggesting that it exerts the most pronounced positive influence on Product Innovation. Furthermore, Security and Privacy (SP) exhibit a substantial positive influence (Beta = 0.344). The impact of Customer Capability (CC) is moderately negative (Beta = -0.127), with a marginally significant difference (p = 0.069). In this model, the constant term, Management Information System (MIS), and User Satisfaction (US) do not exhibit statistical significance as predictors.

DISCUSSION OF RESULT

The demographic data presents a heterogeneous sample with respect to country classification, age, gender, educational attainment, organisation size, and industry sectors. The inclusion of this Ambidexterity model enhances the comprehensiveness of the research outcomes, as it signifies a wide range of viewpoints and life experiences from developed and developing countries alike. Product Innovation is significantly influenced by the predictors (Management Information System (MIS), Customer Capability (CC), Information Quality (IQ), User Satisfaction (US), and Security and Privacy (SP), according to the regression analysis. In particular, the design of Management Information Systems (MIS) is vital to the facilitation of product innovation processes. A well-designed Management Information System (MIS) guarantees that institutions possess prompt, pertinent, and precise data, all of which are critical for facilitating well-informed decision-making and recognising prospects for novel ideas. Several patterns become apparent when contrasting the effects of management information design on product innovation in developed and developing countries:

In developed countries, where technological capabilities and infrastructure are frequently more developed, management information system (MIS) design is typically quite sophisticated and integrated. By facilitating agile decision-making, departmental collaboration, and complex data analysis, this sophisticated management information system promotes an environment that is ideal for product innovation. On the other hand, developing countries may encounter obstacles in the design of MIS systems due to constraints on resources, infrastructure deficiencies, and skilled labour. However, these disparities are being increasingly bridged through the implementation of innovative strategies, including cloud-based solutions, open-source software, and strategic partnerships with technology providers. Consequently, by facilitating strategic insights and effective data management, effective MIS design can substantially contribute to product innovation, even in developing nations.

The Significance of MIS Design in Fostering Innovation in Developed Countries: Gupta and Sharma (2015) as well as Cheng and Huizingh (2014) highlight the critical importance of MIS design in this regard in their respective studies. Product innovation initiatives are fuelled by sophisticated MIS functionalities, including real-time reporting, artificial intelligence, and big data analytics, which enable organisations to discern market trends, customer preferences, and competitive opportunities. The Importance of MIS Design for Innovation in Developing Countries. Dwivedi et al. (2015) and Al-Debei et al. (2015) highlight the difficulties developing countries encounter when attempting to optimise MIS design for innovation. Infrastructure constraints, digital divide issues, and the necessity for capacity building are some of these obstacles. Nevertheless, in the context of developing nations, novel approaches such as agile MIS development methodologies and leapfrogging technologies present encouraging prospects for surmounting these obstacles and propelling product innovation. The Significance of Cross-National Collaboration and Knowledge Transfer in Promoting Innovation: Prominent academics such as Damanpour and Schneider (2006) and Zahra and George (2002) expound upon the criticality of cross-national collaboration and knowledge transfer in this regard. Collaborations between developed and developing nations in the domain of MIS design have the potential to facilitate technology transfer, skill development, and the exchange of best practices. These outcomes can significantly expedite global endeavours to innovate products. Through the incorporation of perspectives derived from these academic dialogues, the results of the research

illuminate the intricate correlation that exists between management information design and product innovation, specifically when examining the interplay between developed and developing countries.

SUMMARY AND CONCLUSION

According to the results of the regression analysis, product innovation is significantly impacted by the management information system (MIS), information quality (IQ), customer capability (CC), user satisfaction (US), and security and privacy (SP), among other predictors. Significantly, the factors of information quality (IQ) and security and privacy (SP) were found to have a positive impact on innovation. Conversely, customer capability (CC) demonstrated a moderate negative influence, although the difference was marginal in significance.

By referencing prior research, this study contributes to academic dialogues concerning the significance of information quality in promoting innovation (Rhee & Haunschild, 2006) and the necessity of security and privacy protocols in establishing an environment conducive to innovation (Li et al., 2018). Moreover, the intricate relationship between customer capabilities and innovation reflects the conclusions drawn by De Jong et al. (2015), underscoring the multifaceted interaction of organisational elements in the course of innovation.

Furthermore, the research's comparative examination of developed and developing countries illuminates possible variations in the way management information is structured and how this influences product innovation in different socioeconomic environments. Developed countries may demonstrate more sophisticated information infrastructures and place greater importance on security and privacy protocols, whereas developing countries can exploit consumer capabilities and adaptability to foster innovation. Thus, gaining insight into the Significance of Financial Management Information Design (FMID),the study makes a scholarly contribution by highlighting the critical importance of FMID in facilitating the development of novel products. This emphasises the criticality of proficient Management Information System (MIS) design, which includes data accessibility, timeliness, and accuracy, in facilitating organisations' ability to discern innovation opportunities and make well-informed decisions. Through the implementation of a comparative analysis, this research enhances the comprehension of the ways in which the influence of MID on product innovation differs among developed and developing countries. This highlights the difficulties that developing countries encounter when attempting to maximise their MIS capabilities, while also demonstrating inventive approaches that bridge technological divides.

The research establishes Information Quality (IQ) and Security and Privacy (SP) as pivotal predictors that have a positive impact on product innovation. This observation highlights the critical importance of maintaining data integrity and establishing consumer trust as key factors in influencing innovation outcomes. The study incorporates perspectives from Gupta and Sharma (2015), Cheng and Huizingh (2014), and Damanpour and Schneider (2006), among others, by drawing from the extant literature. This integration enhances the theoretical foundations of the study and offers a comprehensive perspective on the influence of MID on innovation.

In summary, this research highlights the importance of financial management information design in stimulating product innovation. It provides valuable perspectives on how institutions can enhance consumer capabilities, security, privacy, and information quality in order to promote innovation. A comparative analysis of the various routes to innovation adoption enhances our comprehension of the varied routes and identifies opportunities for developing and developed nations to share knowledge and best practices. The implications of these findings extend to policymakers, industry practitioners, and researchers who are committed to fostering innovative ecosystems and advancing sustainable development on a global scale.

RECOMMENDATIONS

It is advisable that organisations, especially those in developing countries, allocate resources towards augmenting their Management Information System (MIS) capabilities. To effectively utilise MIS for innovation, this entails the adoption of agile development methodologies, the utilisation of cloud-based solutions, and the upskilling of personnel.

Policymakers and industry stakeholders ought to promote initiatives that facilitate knowledge transfer and cross-national collaboration. Collaboration between developed and developing nations has the potential to foster a global innovation ecosystem through the facilitation of technology transfer, sharing of best practices, and capacity development.

Prioritising Security and Privacy (SP) measures and Information Quality (IQ) measures is imperative for organisations. The implementation of strong data quality controls, encryption protocols, and privacy policies serves to improve innovation outcomes, foster customer confidence, and ensure adherence to regulatory requirements.

Continuous Monitoring and Evaluation: Organisations must monitor and assess the efficacy of their FMID strategies in fostering product innovation on an ongoing basis. Consistent evaluations, feedback systems, and performance indicators can aid in pinpointing areas that require enhancement and guarantee adherence to strategic goals.

It is recommended that scholars undertake additional investigations regarding the influence of FMID on innovation, placing particular emphasis on emerging technologies and industry-specific intricacies. In order to foster innovation, conferences, and knowledge-sharing platforms should facilitate the exchange of best practices and lessons learned regarding the implementation of FMID.

REFERENCES

1. Barriers to Product Innovations: A Theoretical Knowledge and Research Framework. (2023). *European Journal of Sustainable Development*, *12*(2). https://doi.org/10.14207/ejsd.2023.v12n2p67
2. Bogers, M. (2019). Open Innovation in Brazil: Exploring Opportunities and Challenges. *International Journal of Innovation*, *7*(2), 177–191. https://doi.org/10.5585/iji.v7i2.417.2318-9975
3. Brown, S. L., & Eisenhardt, K. M. (1995). Product development: past research, present findings, and future directions. In *Academy of Management Review* (Vol. 20, Issue 2).
4. Chibuike Daraojimba, Kehinde Mobolaji Abioye, Adebowale Daniel Bakare, Noluthando Zamanjomane Mhlongo, Okeoma Onunka, & Donald Obinna Daraojimba. (2023). Technology and innovation to growth of entrepreneurship and financial boost: a decade in review (2013-2023). *International Journal of Management & Entrepreneurship Research*, *5*(10), 769–792. https://doi.org/10.51594/ijmer.v5i10.593
5. de Moraes, M. B., Campos, T. M., & Lima, E. (2019). Models of innovation development in small and median-sized enterprises of the aeronautical sector in Brazil and in Canada. *Gestao e Producao*, *26*(1). https://doi.org/10.1590/0104-530X2002-19
6. Gomber, P., Kauffman, R. J., Parker, C., Weber, B. W., Gomber, P. ;, Kauffman, R. J. ;, & Parker, C. ; (2018). *On the Fintech revolution: Interpreting the forces of innovation, disruption and transformation in financial services* (Vol. 35, Issue 1). https://ink.library.smu.edu.sg/sis_research
7. Gozali, L., Karunia Tunjungsari, H., Yuri Zagloel, T. M., Saraswati, D., Tjahjono, B., Mangihut Simatupang, T., Laksono Singgih, M., Masrom, M., Harun, N., & Sutopo, W. (2021). *A Dynamic Business Modelling Approach to Design and Experiment New Successful Business Incubator Model for Indonesia*.

8. Haaland, I., Roth, C., Wohlfart, J., Andre, P., Chen, Y., Cruces, G., Delavande, A., Doerrenberg, P., Hensel, L., Hoffman, M., Lergetporer, P., Marechal, M., Mckenzie, D., Nyhan, B., Perez-Truglia, R., Schwardmann, P., Sood, G., Ubfal, D., Vautrey, P.-L., & Zafar, B. (2021). *Designing Information Provision Experiments* *.
9. Jabar, J., Soosay, C., & Santa, R. (2011). Organisational learning as an antecedent of technology transfer and new product development: A study of manufacturing firms in Malaysia. *Journal of Manufacturing Technology Management*, *22*(1), 25–45. https://doi.org/10.1108/17410381111099798
10. Knudsen, M. P., von Zedtwitz, M., Griffin, A., & Barczak, G. (2023). Best practices in new product development and innovation: Results from PDMA's 2021 global survey. *Journal of Product Innovation Management*, *40*(3), 257–275. https://doi.org/10.1111/jpim.12663
11. Konur, K., & Alkan, R. M. (2021). The role of geomatics engineer in smart cities: a view within the framework of turkish 2020-2023 national smart cities strategy and action plan. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences – ISPRS Archives*, *46* (4/W5-2021), 333–341. https://doi.org/10.5194/isprs-Archives-XLVI-4-W5-2021-333-2021
12. Kozludzhova, K. (2023). Key Aspects of Product Innovations: Theoretical Knowledge and Research Study. *International Journal of Professional Business Review*, *8*(6), e02361. https://doi.org/10.26668/businessreview/2023.v8i6.2361
13. Krijnen, W. P. (2023). *A Comparative Analysis of Regression Models for Global Health Prediction*.
14. Larisa, Șavga, & Tatiana, B. (2022). *Boosting the process of smart specialization in the republic of moldova*.
15. Mertens, K. G., Rennpferdt, C., Greve, E., Krause, D., & Meyer, M. (2023). Reviewing the intellectual structure of product modularization: Toward a common view and future research agenda. *Journal of Product Innovation Management*, *40*(1), 86–119. https://doi.org/10.1111/jpim.12642
16. Namusonge, M., Muathe, S., & Kiveu, M. N. (2019). Effect of innovation on firm competitiveness: the case of manufacturing SMEs in Nairobi County, Kenya. *International Journal of Business Innovation and Research*, *18*(3), 307. https://doi.org/10.1504/ijbir.2019.10019560
17. Peffers, J. (2006). *The Design Science Research Process: A Model for Producing and Presenting Information Systems Research*. http://rightsstatements.org/page/InC/1.0/?language=en
18. Quaye, D., & Mensah, I. (2019). Marketing innovation and sustainable competitive advantage of manufacturing SMEs in Ghana. *Management Decision*, *57*(7), 1535–1553. https://doi.org/10.1108/MD-08-2017-0784
19. Rasool, S. F., Samma, M., Mohelska, H., & Rehman, F. U. (2023). Investigating the nexus between information technology capabilities, knowledge management, and green product innovation: evidence from SME industry. *Environmental Science and Pollution Research*, *30*(19), 56174–56187. https://doi.org/10.1007/s11356-023-26308-7
20. Santoso, B., Hikmawan, T., & Imaniyati, N. (2022). Management Information Systems: Bibliometric Analysis and Its Effect on Decision Making. *Indonesian Journal of Science and Technology*, *7*(3), 583–602. https://doi.org/10.17509/ijost.v7i3.56368
21. Sonmez Cakir, F., Kalaycioglu, O., & Adiguzel, Z. (2023). Examination the effects of organizational innovation and knowledge management strategy in information technology companies in R&D departments on service quality and product innovation. *Information Technology and People*. https://doi.org/10.1108/ITP-03-2022-0196
22. Supriyono, E., Indrayani, E., Ramdani, R. R., & Syafri, W. (2023). Data Visualization Analysis in the Management Information System for Submitting Credit Scores for Education Personnel. *International Journal of Social Science and Human Research*, *6*(12). https://doi.org/10.47191/ijsshr/v6-i12-27
23. Xiao, Y., & Bharadwaj, N. (2023). The 2022 PDMA Doctoral Consortium: Emerging research priorities in new product development and innovation and insights into community building. *Journal of Product Innovation Management*, *40*(5), 582–592. https://doi.org/10.1111/jpim.12683