ISSN: 2182-2069 / E-ISSN: 2182-2077

Evaluating the Financial Returns on Investment in Sustainable Enterprise Digitalization Initiatives Using AI Information System

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Received: June 03, 2024; Revised: July 11, 2024; Accepted: September 02, 2024; Published: November 30, 2024

Abstract

With a focus on sustainability and IT changes, the companies even find an AI based system information system implementation in operations. This study analyzes the financial yield of return on investment (ROI) in the digitalization of leading edge enterprises, as well as finds out how AI information systems could achieve prosperity in both the economic and ecological spheres. The research utilizes a mixed-method methodology, combining the quantitative analysis of business finances from companies that have implemented intelligent environmental activities with qualitative case studies. Credit factors like ROI, NPV (net present value) and IRR (internal rate of return) together with environmental performance parameters are evaluated. Furthermore, by conducting surveys and interviews with trusted experts in the industry, the quantitative data is richer within it giving strategic and operational implications of the current initiatives. A study has been found that companies using AI for sustainability purposes are capable of returning very large financial results, much greater than the ones achieved by other digitalization initiatives. The study demonstrates that AI data systems boost efficiency, cut costs, and enhance market competitiveness. It highlights ecological benefits like reduced carbon footprints, efficient resource use, higher profits, and regulatory compliance. It guides stakeholders on AI investment for future ROI, advocating more AI technology funding. The research calls for an integrative approach that includes financial and sustainability measures to capture value. Incorporating AI in sustainable and eco-based digitalization is crucial for optimal financial and environmental outcomes. The organizations strategically utilizing the loop technology are also believed to have an advantage over others with regards to the current market landscape and will be able to make a balance between profitability and sustainable goals.

Keywords: Information Systems Pre-digitalization Financial Performance, Sustainable Enterprise Digitalization, System Integration, Financial Returns on Investment, AI-powered Data AI-driven Decision Support.

Journal of Internet Services and Information Security (JISIS), volume: 14, number: 4 (November), pp. 21-44.
DOI: *10.58346/JISIS.2024.I4.002*

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1 Introduction

Organizational processes in accounting are connected to information system integration strategies like enterprise resource planning systems, which aggregate and extract data from databases. Ultimately, by maintaining records, creating and implementing hierarchical structures, and planning and arranging transaction combinations, they intend to facilitate the development and manipulation of an entire virtual view of the nature and flow of activities and resources (Marcella & Middleton, 1996). It has been proposed that the incorporation of an information system may increase the strictness of conventional type control by decreasing the possibility of individual choice and increasing the chance of alternatives appearing more hierarchically. However, vendors have justified the Institute for Scientific Information by saying that it fosters resilience and creativity. Managers will be able to verify connections by using increasingly detailed recordings of organizational actions rather than merely abstract summary data. Because of this, the Institute for Scientific Information is thought to provide ostensibly uneven opportunities for resilience and control (Chapman & Kihn, 2009). The shift to digital is still ongoing. Because of the introduction and broad use of digital technology, as well as the rapid expansion of technical innovation, organizations, the economy, and society are undergoing profound changes. Digitalization has significant economic and social effects that influence many facets of our personal and professional lives, despite being predominantly driven by technology. This goes beyond a technical fad (Selimović et al., 2021).

Owing to the extensive social-technical influence, professionals are delving deeply into the administrative challenges brought about by digitalization. In the meantime, a deluge of posts from management consultancies attests to their capacity to offer thorough advice on how to handle these challenges. Conversely, academics are just now beginning to closely investigate the new challenges (Teubner & Stockhinger, 2020). The recent swift shift to digital technology has fundamentally altered the nature of labor. Since the majority of work is now completed digitally, employees ought to get more accustomed to and at ease with using digital technologies (Calvaresi et al., 2023). They ought to employ modern digital technology and apply it to a variety of tasks at work. The digital workplace simultaneously enhances and demands a variety of personnel skills, including the capacity for continuous learning, quick thinking in unexpected circumstances, and cooperative problem solving. Furthermore, a growing portion of labor in the digital workplace will probably involve human-robot interaction, requiring employees to be more inventive and creative in generating new value (Selimović et al., 2021). Another aspect of the Flexible Manufacturing strategy is increasing product customization in flexible manufacturing environments, such as mass production sectors. Industry 4.0 is fundamentally distinct from earlier industrial automation, encompassing not only the digitization of goods and manufacturing but also the creation of new digital business models and modifications to quality management (Quan & Rui, 2023). The alterations mentioned above are the result of shifting business paradigms. Economically speaking, lean manufacturing will eventually give way to individual production because robotic production uses less energy and other resources more efficiently. The business concepts behind the aforementioned changes are paradigm shifting corporate practices which move toward 3D printing resulting in an effective use of available resourcs demonstrated by the necessity to look at the financial aspects of having Industry 4. 0 (Leana & Barry, 2000). This paper introduces digitalization and vertical integration across the entire value chain where the same effects will be noticed such as reduced operating cycles, gains on costs of non-production activities in all the sectors, and flexibility during financial planning and budgeting (Leana & Barry, 2000). Such reconfigures fuel fast happenings in logistics, processes, as well as incoming business from the intelligent sensors, data

exploration and augmented reality integration in its products (Skorobogatova, 2019). Artificial intelligence is transforming the business landscape, despite the belief that it is not happening at this quick pace. It is true that decisions about a variety of topics, such as bank loans and crop harvests, are currently being influenced by AI. But future possibilities like completely automated customer service are not too far off. AI-enabling technologies are evolving quickly and getting easier to reach. Examples include development platforms, data storage, and massive computing power. It seems that companies are eager to adopt AI (Uşar et al., 2019).

In fact, we estimate that artificial intelligence will boost the world economy to $13 trillion over the next ten years (Fountaine et al., 2019). When AI is widely applied, employees at all organizational levels will use algorithm recommendations to enhance their judgment and insight in order to come up with a superior solution to either computers or humans. But in order for this tactic to work, individuals at all levels must reject the conventional top-down methodology and have the confidence to decide based on the algorithm's recommendations. If an employee needs to get permission from a superior before working, then using AI will be hindered (Fountaine et al., 2019). Apart from investigating the correlation among employees' psychological requirements, job performance, and well-being expectations within the digital workplace, a noteworthy feature of our study is the evolution of digital workspaces in the financial services sector during the transition economy (Roffe, 2002). Researchers concentrate on the background of the study for a number of reasons. Initially, the financial sector was the first to be affected by the swift digital change. Financial services firms are unique from other areas since they are predominantly owned by foreign entities, which has resulted in a spectacular and rapid transfer of knowledge and technology from overseas. It is among the most widely accepted theories explaining the notable digitization of the financial industry (Oppermann et al., 1997). Furthermore, in comparison to other service sectors, the financial services industry is bound by stringent regulations and a high degree of standardization. Financial service providers need to strike a balance between meeting stakeholder demands for increased trust and transparency and managing digital transformation in a highly regulated environment (Selimović et al., 2021).

Scope of the Study

We aim to expand our knowledge on the subject by looking at how effective system integration, AI-powered decision-making support, and sustainable enterprise digitization all impact financial performance in a dynamic information system context. Our method transcends individual components and presents a comprehensive outlook, offering valuable counsel to businesses navigating intricate intersections between technology, sustainability, and economic prosperity.

Theoretical Gap of the Study

The study closes a theoretical gap by conducted on these components in the past, little research has been done on how they interact to impact overall financial performance. This study aims to close this theoretical gap by creating an integrated framework, filling in gaps in the literature, and offering a more thorough examination of the social, economic, and environmental effects of sustainable digitalization projects. Through an examination of the intricate connections among these essential components, the integration approach opens up new avenues for research and develops the theoretical framework surrounding the subject.

This leads to objectives: (i) To assess the multifaceted impact of sustainable enterprise digitalization on financial performance within information systems. (ii) To investigate the role of effective system

integration in fostering operational cohesion and enhancing overall efficiency in the context of sustainable digitalization. (iii) To explore the contribution of AI-driven decision support in information systems to financial performance and organizational decision-making processes.

Based on these three research objectives, our research questions are: (i) How does sustainable enterprise digitalization influence financial performance in information systems, considering both short-term financial gains and long-term sustainability implications? (ii) What are the dynamics of system integration in the context of sustainable enterprise digitalization, and how do they contribute to operational efficiency and financial outcomes? (iii) To what extent does AI-driven decision support impact financial performance, and how does it enhance organizational decision-making processes within information systems?

2 Literature Review

The major variables that were addressed will be reviewed in the literature. These variables are Information systems pre-digitalization financial performance, sustainable enterprise digitalization, system integration, financial returns on investment and the mediating effect of AI-powered data AI-driven decision support. Based on the literature hypothesized relationships are also established.

Information Systems Pre-digitalization Financial Performance

According to recent research, information systems may have a positive effect on performance; nevertheless, how well people perform will determine whether or not this potential is realized. This idea is supported by literature on the company's resource-based approach, which holds that information and communication technology may be easily copied to gain a competitive advantage. Studies on the operation of these systems in real-world environments reveal that technical developments do not lead to an increase in control, flexibility, clutter, or configuration. Field studies of technology and control effectively illustrate the intricate nature of the relationship between technology and management practice (Chapman & Kihn, 2009). The popularity of computing, storage, and communication-related hardware and software has expanded due to the quick growth of information and communication technology (ICT), which includes cloud computing, mobile devices, big data mining, and social media. Facebook, Amazon, Apple, Microsoft, and Google have all grown quickly since 2000. Emerging technologies like artificial intelligence, the Internet of Things, robotics, cybersecurity, 3D printing, and blockchain have recently accelerated industry growth toward the trend of digital transformation, which includes fintech, e-commerce, smart cities, smart tourism, smart healthcare, and smart manufacturing (Tsaih & Hsu, 2018). A decision-making system is an interactive computer-based information system designed to assist in making decisions. The idea of decision-making systems originally appeared during the theoretical examination of organizational decision-making that was conducted. The richness and complexity of the decision-making support system have been leveraged by researchers in related fields, including artificial intelligence, operations research, organizational studies, and management information systems, in addition to a variety of research methodologies and practitioners. Systems for making and supporting decisions (Liu et al., 2010). "Digitalization" is the process of moving offline, and online activities and documents to support electronic interactions. Computer networks with Internet-enabled platforms that promote online communication are typically considered digital technologies. Digitalization is a tool that governments can employ to address issues with outdated, paper-based processes. The use of mass digitization as an innovation to increase efficacy and efficiency in both the public and private sectors is acknowledged in information systems literature. One cutting-edge approach to e-government is

digitization, which modifies internal public administration procedures to improve integration and efficiency. Nonetheless, there has been a greater focus on external interactions, including those between the government and the populace, or on e-government initiatives between the government and enterprises in emerging nations (Effah & Nuhu, 2017). A recent paradigm shift that has altered how people think and create things is called digitization. It has given companies a new avenue for growth. The interchange of data between objects, pictures, and sounds over a quick, powerful signal channel is referred to as digitization. Instead of focusing only on transactions and processes, take into consideration a range of technologies that can be utilized to create value, such as cloud infrastructure, mobile phones, telemetry, social preferences, big data, metadata, analytics, behavior, and expression. Future wealth generator and part of the emerging digital economy. The advent of digitalization has significantly increased the amount of data and information available. Consequently, humans are increasingly more intelligent. A wave of consciousness has reached our souls, and we are now responding, thinking back, and reevaluating the things that have transpired around us. As a result, we now accept ideas, opinions, and thoughts more readily. It is obvious that our capacity for judgment has awakened, and we are now organizing and focusing our efforts to better ourselves (Bhutani & Paliwal, 2015).

Sustainable Enterprise Digitalization

Ensuring the long-term sustainability of the organization should put the demands of all stakeholders first. This mission statement has the effect of devaluing mitigation of specific tasks and unit cost optimization. Instead, the focus is on how to create sustainable energy sources as quickly as possible. The first principle recognizes that when an organization's members share a common objective, the current work makes sense in terms of how to get there (Cochran & Rauch, 2020). The organizational structure of traditional production companies would change due to the introduction of new roles in "smart" organizations, like handling large amounts of data arrays. This would have a significant effect on the global industry overall. When considering the cost of its equipment and the number of personnel, the engineering department, which encompasses multiple fields, is the largest in the manufacturing industry globally. Engineering's primary objective is to provide the productive forces required to keep the economy's reproduction processes going (Lazarevna et al., 2020). There is a paradox that the native maritime industry has not experienced a true surge in the digital era even though the latest digital wave has literally transformed other economic fields. A recent systematic literature review in major journal databases reveals a deviation of only 99 research papers which are related to digital disciplines in the maritime domain, such as automotive and mastering vehicles, artificial intelligence, big data, immersive reality (both virtual and mixed reality), Internet of Things, cloud and edge computing, digital security, 3D printing, and additive manufacturing. To the point that global efforts are constantly underway to boost digitalization while cars are sailing domestically. But it's not a matter of the overall success in harmony, economic development inequality between countries and countries, also hinders globalization due to political, legal and administrative difficulties.

Sustainability means staying the same over a long period of time (it is known as the capacity to endure over time). It is one of the most significant concepts of the 21st human civilization which promotes coexisting with nature. This thought provoking mentality of future development should be done to prevent degradation and environmental harm to ensure green and sustainable future generations (Kapidani et al., 2020). Sustainability is the simultaneous achievement of positive social, economic, and environmental results that support businesses' long-term competitiveness. The port's propensity to bring in more passengers and cargo indicates the marine industry's economic performance. Enhanced financial and operational performance of linear shipping companies; an endeavor to synchronize partners and

procedures in marine supply chain management to optimize earnings etc. To prevent accidents by lowering dangers and potential impacts in ports and at sea, smart port and smart rule development is crucial, especially if present efforts are focused on building smart (partially or fully autonomous) ships. Weighing the benefits and drawbacks of biological and virtual intelligence, or virtual smartness, we also need to take into account the human element of technical breakthroughs in the maritime sector (Andriushchenko et al., 2020).

System Integration

Integration of services indeed, enables businesses to tap into integration and specialization opportunities as well as maximize the lifecycle of assets. The scope of influence which the external environment exerts over the development of system integration skills is wide. The consumer base of each country is demanding more and more that the suppliers include monetary compensations for the designing of new products and at times even the systems of communications and special types of training programs. By the same token, if the product system providers want to win competitions, they will have to develop new capabilities. Integrated R&D departments intended for the big monopolies of national systems subcontract work to system integrators on design, development and occasionally operation, as the second movement started privatizing which led to acquiring new skills (Hobday et al., 2005). The development of effective solutions to the problems of the fast-paced nature of the consequences and intercommunication caused by the increasing complexity (mathematical and computational aspects of the whole picture should be dealt with, enhanced integration should be utilized, etc.) is vitally important for sustainable policy and management. Instances of such s are supply chain analysis, lifecycle assessment at the local level as well as multi-level modeling. A vehicle for description, the agent-based model, portrays hypothesis scenarios of coupled systems as complex adaptive systems and integrates multi-scale interactions. Because of the nature of AI system integration, even when testing a business process in a specific setting can be adequately confined, basic schematics of the "best practice" process are frequently preset. The AI system's technical analysis and modular architecture have enabled the development of a control system that can completely inform its users of the internal operations of the processes it manages, leading to such useful simplifications. This has a direct impact on internal transparency (Hasselbring, 2000). This would imply that a workable strategy provides unique advantages considering the goal of activating the control system, which is to support users in their endeavors to react adaptably and under control in changing circumstances. Most importantly, a workable strategy offers direction on how to use them using the internal and global openness design elements. The four functional design elements delineate an active managerial role that anticipates adaptability and maintenance (Gunadi et al., 2020). Global transparency specifically aims to foster unity between regional efforts and broader concerns. Since local transparency, repair, and flexibility all aim to support managers in their attempts to manage, it is reasonable to assume that they will improve the idea of system performance (Chapman & Kihn, 2009). Many stakeholders are involved in the enterprise's change, and they typically have an impact on multiple corporate ratings. Taking into account the likelihood that some abilities, such as "dynamic abilities", which are connected to the production, integration, and growth of organizational resources, exist and are flexible Redefining the organization's objective, restricting excessive productivity, re-creating a business by tying its governing body to the environment, and energizing the workers are the four main topics of the essay (Cross & Israelit, 2021). Campaign flaws arise from the fact that enterprise transformation initiatives are influenced by quickly evolving circumstances, such as the advancement of IT technologies. The report emphasizes that innovations that

help businesses adapt digitally are given special consideration and apply to practically every industry (Andriushchenko et al., 2020).

Financial Returns on Investment

There can be no denying the fact that whether the economy's performance is favorable or not determines to a large extent how people judge whether the investment return has been worth it or not. When important projects are sparked by obstacles, those in finance support officials at work and end-users acquire sufficient returns. However, in such cases, medical image analysis is likely to get more funding and engagement from both academics and practitioners. Others use them in various descriptive ways, including as a motivator for top management, a representative of financial consequences, and a sale point of financial research. In this respect, availing and assigning the proper value to economic information is more critical than the actual returns on investment of various organizational initiatives (Farida & Setiawan, 2022). The literature review states that previous research on return on investment viewed the method as a single formula tool complicated by a range of distinctive characteristics and attributes applied arbitrarily by different research and practitioner groups. This study's primary goal is to offer a methodical understanding by outlining the fundamental traits of return on investment and categorizing various forms of return on investment in accordance with these traits (Felce et al., 2016). A novel return on investment strategy based on a series of numerical parameters rather than a single integer is produced using a methodical approach to return on investment. Furthermore, an analysis has been conducted on the sample case's return on investment sensitivity to error. A variety of ROI models, such as conventional ROI models, extensions, virtualizations, and duplicates, have been developed and explored. The available classifications facilitate the process of selecting the most appropriate investment type for a particular scenario (Botchkarev & Andru, 2011). Research will therefore produce findings and impacts like social involvement, knowledge development, networking, and fresh perspectives. For this reason, research is a crucial subject for both public and private educational establishments. Prioritizing research also boosts domestic output and draws attention to foreign initiatives. By evaluating innovations that are objectively quantified based on system improvements in both research production and goods, it may be identified. Furthermore, the knowledge produced by the research has a favorable impact on the macro-economy and microbusiness revenue of the country (Qureshi, 2013). When it comes to a community's socioeconomic development, knowledge generation is no different. A study methodology was used to measure qualifications, accounting for the productivity of input into output. Cognitive production was another technique to evaluate the study's efficacy. The two crucial elements of measuring the equation are represented by the outcomes and effects at the same time (Sanusi et al., 2021). Effective communication has acquired popularity recently in the fields of organizational behavior, corporate management, and communication consultancy as a crucial element of successful organizational sustainable development and financial performance. Companies and institutional communication specialists are looking into efficient measurement methodologies to confirm the effect of internal communication initiatives on enhanced financial performance at the organizational level (Cloete, 2017). Thus, it is now evident that the financial notion of return on investment may be applied and discussed in order to acknowledge the critical role that good communication plays in fostering organizational development. Given the volatility of the global financial markets, in which firms and their communications professionals operate, this research seems especially essential today (Meng & Berger, 2012).

AI-powered Data AI-driven Decision Support

Fifty years after its initial introduction, the term "artificial intelligence" is still widely used. Artificial intelligence (AI) decides what we may see on social media, evaluates criminals for potential punishment, evaluates a person's reputation, and even recommends the most efficient route home from work. Most AI systems are educated on previous data in order to make judgments; they can recognize patterns, draw lessons from the past, and forecast future results (Aleven et al., 2003). Predictions and classifications made from extremely large datasets that exceed the speed and scope of human study are the source of these generalizations. Artificial intelligence is referred to as "new electricity" because of its enormous impact. There are social and ethical ramifications to the development and use of these technologies by governments and businesses (Marda, 2018). Applications of AI and data analytics are becoming much more prominent. Artificial intelligence-enabled chatbots and virtual concierges, for instance, may comprehend and adjust to guests' preferred languages while providing information on neighboring establishments, places to eat, and tourist attractions. Technological developments have led to notable advances in guest customization levels because these systems can alter answers depending on individual visitor data. These innovations have not only made customers happier but have also expedited the company's growth. Artificial intelligence (AI) and data analytics are the two primary technologies transforming the industry, particularly in the area of visitor personalization. Artificial intelligence (AI) machines are machines with simulations of human intellect that can do tasks that normally need human intelligence, like learning from data and making predictions (Said, 2023). When AI is widely applied, employees at all organizational levels will use algorithm recommendations to augment their judgment and intuition in order to come up with a superior solution than either computers or humans But in order for this approach to be successful, a departure from the conventional top-down approach is needed so that individuals at all levels feel empowered to make choices and accept the algorithm's recommendations.

If an employee needs to get permission from a superior before working, then using AI will be hindered. When an intricate human event scheduling mechanism was replaced with a new AI system, the organization saw a dramatic shift in decision-making (Pillai & Sivathanu, 2020). Historically, the company's event coordinators have used color tags, pins, and stickers to keep an eye on participant preferences, conflicts, and other considerations. They frequently followed their intuition while making judgments and sought guidance from senior managers who were also following their instincts. The new system evaluated a wide range of scheduling permissions quickly and ranked the best plans for each participant by using two algorithms: one to reduce hundreds of millions of possibilities to millions of scenarios, and the other to reduce those millions to just hundreds (Fountaine et al., 2019). They showed in their study how predictive models may be used to forecast future trends based on historical data, allowing businesses to adjust their strategy in a proactive manner Decision-makers can find opportunities and make well-informed choices in low-risk, uncertain, and unpredictable scenarios with the use of these predictive powers (Gupta et al., 2023).

Hypothesis Development

A crucial part of research is developing a hypothesis, which directs investigations and makes predictions about the relationships between variables. These assumptions are based on accepted theories that highlight the pathways and contextual effects through which artificial intelligence behavior can affect workplace productivity. Researchers can systematically explore and understand correlations between

variables with the support of these well-informed predictions, which inform study design and statistical analysis (all hypotheses evolved in accordance with Figure 1).

The Effect of Sustainable Enterprise Digitalization, System Integration, Financial Returns on Investment in Information Systems Pre-digitalization Financial Performance.

Among the challenges and growth paths that the world is currently experiencing are the sharing economy, digitization, sustainable development, and carbon emission control. All of these require innovations that may be tailored to the needs of business. A collaborative economy is a modern socioeconomic phenomenon that affects energy efficiency and sustainable economic growth. Government initiatives are necessary for domestic enterprises to create sustainable business models. Digital development will foster innovation in business. Moreover, studies have shown that sustainable development will be the foundation of contemporary public policy. The capacity of enterprises to develop sustainably will be impacted by changes in government regulations on digitalization (Hao et al., 2022). Management system integration is defined as "combining various function-specific management systems into a single and more effective influence management system." Although quality management systems are crucial for the industry, other management systems not simply those related to quality are also considered during the integration process. The four primary components of the management system integration process are audit integration, integration level, integration techniques, and implementation strategy. According to their findings, when it comes to integration, organizations "coordinate with the most strategic goals, documents and procedures (policy, objectives and manual in terms of targets and documents, and internal communications for record control, internal audits and procedures), operations and integration strategies later" (Bernardo et al., 2012). Companies in the modern marketplace are more concerned than ever that their customers enjoy a unique experience when utilizing their products and/or services. Quality management systems are being used by more companies as a strategy to boost productivity and competitiveness since they ensure that products and or services satisfy standards. Numerous integration strategies have been put forth. The last requirement that must be stressed is the degree of integration Similar to strategy and methodology, an organization's own needs determine the right amount of integration for it (Almeida et al., 2014). A return on investment (ROI) is arguably one of the most often used metrics for profit analysis. In financial statement analysis, return on investment, along with price income and market-to-book ratios, is a crucially profitable metric. Companies continue to assess managed business unit performance using the return on investment metric through profit centers, giving them the opportunity to decide whether to invest or not for administrative control reasons. Industry organization literature frequently uses return on investment to gauge industry competitiveness and bolster antitrust regulations. Lastly, traditionally, product prices have been set to satisfy the requirement that a regulated firm make a defined return on its investment in many regulated industries, including utilities and telecommunications (Rajan et al., 2007).

H1: There is an association between sustainable enterprise digitalization and information systems pre-digitalization financial performance.

H2: There is an association between system integration and information systems pre-digitalization financial performance.

H3: There is an association between financial returns on investment and information systems pre-digitalization financial performance.

The Effect of Sustainable Enterprise Digitalization, System Integration, Financial Returns on Investment on AI-powered Data AI-driven Decision Support.

Digital technologies like Big Data, IoT, and mobile internet have made large capacity possible in all areas of the acoustic landscape. Enterprise technologies and procedures are being advanced by firms through the use of these techniques, which are helping them achieve control over their expenses and resources. It has benefited society by bringing people together and putting them on a common digital platform. Because of its affordability and abundance of growth prospects, it also helps to maintain economic stability. Thus, this approach promotes sustainable growth and aims for general development (Bhutani & Paliwal, 2015). In order to guarantee the sustained growth of rural regions, rural populations actively participate in effective land resource management. Implementing initiatives to improve soil fertility and establishing organic farms that provide cooperatives in a way that either directly or indirectly addresses effective land resource management are two examples of this (Zos-Kior et al., 2020). Strangely enough, the literature on high-performance work systems and strategic human resources is far from defined when it comes to best practices for determining whether and what strategic plans are valuable. To put it another way, establishing high-performance work systems presents enormous obstacles. The installation of high-performance work system components, for instance, carries a major financial risk for small organizations. In contrast, huge businesses occasionally have opaque decision-making procedures that contribute to the success of these systems. Stated differently, we lack a thorough understanding of how companies choose which high-performance technologies to use (Johnson et al., 2017). Coordination and development demand sophisticated strategic control and leadership in resource-diverse organizations. The approach must be both practical and evolutionary, taking into account the tiny steps that companies take to identify fresh advantages and carry out strategic renewal. Corporate leadership thrives when control systems are combined, when distinct payment criteria are adopted, and when decision-making methods are standardized. Because of this, an organization's competitive edge cannot be sustained as it changes, no matter how effective strategic planning and strategic control, if they are based only on financial standards and industrial analysis (Williams, 1992).

Concurrently, the digitization of industrial enterprises increases the possibility of improving a company's sustainability through a quicker and more effective evaluation of its current technological, organizational, and financial circumstances. Specifically, the utilization of big data technology ensures real-time physical wear and tear tracking and early equipment obsolescence prediction. These innovations, in conjunction with the "Internet of Things" and artificial intelligence, significantly boost marketing effectiveness and, consequently, the stability of businesses (Ivanov et al., 2021).

H4: There is an association between sustainable enterprise digitalization and AI-powered data AI-driven decision support.

H5: There is an association between system integration and AI-powered data AI-driven decision support.

H6: There is an association between financial returns on investment and AI-powered data AI-driven decision support.

H7: There is an association between information systems pre-digitalization financial performance and AI-powered data AI-driven decision support.

AI-powered Data AI-driven Decision Support as a Mediator

The advancement, application, and promotion of AI have been given high emphasis by the government. The premise of this approach is that artificial intelligence (AI) has the power to enhance people's lives and advance social equality. 2018 saw a 100% rise in central government funding for education, training,

and research in cutting-edge fields like artificial intelligence. Setting digital technology as a top priority is nothing new. The Country is intended to become a "cognitive economy and a society empowered by digital means" through the national governments' digital strategy. Everybody would have access to digital infrastructure as a fundamental utility under Digitalization, which will also incorporate digitalization into governance and ultimately give citizens more power (Marda, 2018). These days, professionals and others rely on their own judgment, expertise, or traditional analysis which can be cumbersome and imprecise when making daily judgments. An intelligent system that can use data on constraints, patient and lifestyle data, and numerous illness features will definitely be beneficial in picking the appropriate approach, especially in fields like medicine where clinicians must choose a technique. This necessitates a collaborative investigation of decision support systems, artificial intelligence (AI), and the various ways in which overlaps, disparities, and synergies might improve company operations (Gupta et al., 2022).

Artificial intelligence has advanced tremendously to this point, and in many domains, its capabilities now match or surpass those of humans. AI has surpassed human abilities in fields such as bioinformatics, medical diagnostics, drug research, and strategic gaming. The quick growth of AI is transforming the nature of professional jobs in the future. Specifically, AI enhances workers' productivity by supporting them with activities in real time. Financial gurus that use AI-based assistant software provide more accurate stock price estimates than those that do not. The majority of current research has focused on how AI supports human operation in real time, with a growing emphasis on AI's complimentary roles and alternative roles. Even though AI can have a significant impact far beyond the role of assistant, its more fundamental implications are as follows: little focus has been placed on how AI develops human experts. Because AI and humans operate differently, humans can now learn from AI and catch up in areas where they are currently falling behind (Choi et al., 2021). Numerous studies on AI-powered decision-making systems have been conducted. It emphasized how crucial artificial intelligence is in giving decision-makers comprehensive insights, analysis of multiple scenarios, and recommendations. These technologies make it possible to assess every option, which leads to a more dependable and knowledgeable decision-making process. In academic circles, ethical concerns regarding the application of AI in decision-making are being voiced. The significance of addressing ethical issues with AI systems, such as accountability, transparency, and prejudice, was highlighted. The improvement of corporate performance and the integration of artificial intelligence (AI) into strategic decision-making have received significant attention in the literature. Experts and professionals alike concur that artificial intelligence (AI) holds great promise for revolutionizing conventional approaches, enhancing mechanisms for decision-making, and fostering operational excellence in several fields (Gupta et al., 2023).

H8: AI-powered data AI-driven decision support mediates the relationship among sustainable enterprise digitalization, system integration, financial returns on investment and information systems pre-digitalization financial performance.

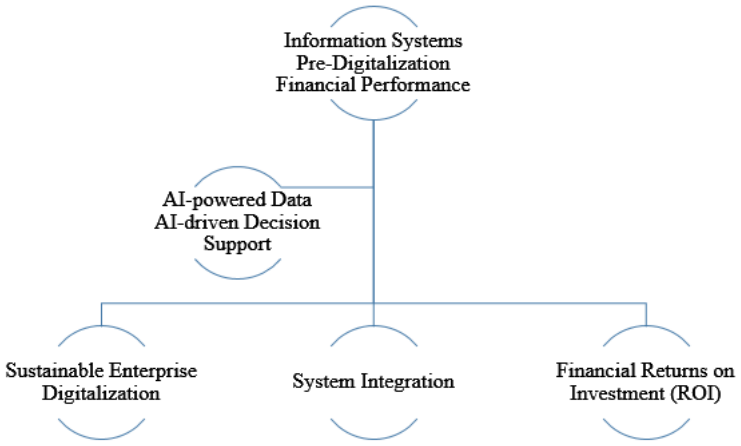

Figure 1: Conceptual Model

3 Methodology

Population

In the quantitative phase, structured surveys are used to collect stakeholder perceptions using a cross-sectional design and stratified random sampling. The data was gathered from 350 participating organizations, ensuring a representative sample that reflects the diversity of the city's workforce. The research employs a quantitative technique, in order to gather thorough insights. An assessment of the perceived efficacy of these activities inside mainstream education is guided by quantitative insights into stakeholders' perspectives that will be provided by statistical analyses of the collected data. Quantitative data on financial performance and AI system implementation costs will be collected.

Sample Size Determination Technique

Sizing up the sample requires a thorough examination of the subject or object of the investigation (Krejcie & Morgan, 1970) created with limited populations in mind, which was used to balance statistical significance with practical viability:

$$n = \frac{N}{1 + \frac{N}{Population\ Size}}$$

Here, "n" denotes the desired number to select from a set. "N" represents the number of individuals we believe to be in that category. Using this calculation, the required sample size for the study was determined to be 350 participants.

Sampling Technique

Random sampling was employed to ensure that equal portions from every area of the schools were covered. In this way, we select comprises workers from several organizations in the population. As a result, it gained more credibility outside of this study.

Data Collection Method

A meticulously altered questionnaire from past studies was used to get the data for physical interview. This survey comprised Likert-scale items graded from 1 to 5, as well as open-ended and closed-ended questions.

Data Analysis Technique

An effective structural equation modeling (SEM) software program called Smart PLS 3.0 was utilized in the investigation. SEM is useful for examining connections between various objects. It is quite beneficial for comprehending the intricate connections between various components. The analysis was conducted in two steps: Initially, we verified that the measuring model was precise and steady. We then examined the structural model to validate our hypotheses about the relationships between various components. Smart PLS 3.0 is an intuitive software with robust analytical capabilities that makes research and authentication simple. Factor loading, complete reliability, and the application of Cronbach's alpha to evaluate the practicality and precision of the measuring model are all included in this. Next, the structural model was put to the test in order to determine path coefficients, significance levels, and the system's overall fit.

Measure

The Information systems pre-digitalization financial performance effects at workplaces and organizations used in the study were evaluated using a scale that was modified from (Chapman & Kihn, 2009), Sustainable enterprise digitalization (Lazarevna et al., 2020), System integration (Bernardo et al., 2012), Financial returns on investment (Meng & Berger, 2012) and AI-powered data AI-driven decision support (Gupta et al., 2023).

4 Results

Table 1 shows that Cronbach's alpha was high, meaning the tool used in this study is reliable and consistent. Table 1 has those details. The Information systems pre-digitalization financial performance effects at workplaces and organizations measure shows Cronbach's alpha score of AI-powered data AI-driven decision support 0.742, Financial returns on investment 0.805, Information systems pre-digitalization financial performance 0.761, Sustainable enterprise digitalization 0.755, System integration 0.763 are at good scales. These results show that these scales are good for checking Information systems' pre-digitalization financial performance effects at workplaces and organizations.

Table 1: Cronbach's Alpha

	Cronbach's Alpha
AI-powered Data AI-driven Decision Support	0.742
Financial Returns on Investment (ROI)	0.805
Information Systems Pre-digitalization Financial Performance	0.761
Sustainable Enterprise Digitalization	0.755
System Integration	0.753

Table 2 shows the results of a special test called Confirmatory Factor Analysis (CFA) for these ideas, proving they are reliable and work well together. The composite reliability (CR) values are notably high for all constructs: AI-powered data AI-driven decision support (CR = 0. 831), Financial returns on investment (CR = 0. 865), Information systems pre-digitalization financial performance (CR = 0. 841), Sustainable enterprise digitalization (CR = 0.835), System integration (CR = 0.833). These numbers are way past the recommended limit of 0.70, showing strong agreement and trustworthiness in measuring tools. The average amount that was pulled out (AVE) values also show the matching strength of these parts. AI-powered data AI-driven decision support shows an AVE of 0.514. This means that 51.4% of the changes in what we see come from the real idea behind it. Financial returns on investment show AVE of 0.566, which means that about 56.6% of the changes are linked to the main thing being measured. Information systems pre-digitalization financial performance is also included with an average of 0.531 which means 53.1%, Sustainable enterprise digitalization shows AVE 0.508, which means 50.8% and System integration shows AVE 0.501 which means 50.1%. These AVE values are higher than the suggested limit of 0.50, showing that the scales used to measure are reliable and match well. The strong CR values, paired with high AVE scores, help make sure the internal consistency and reliability of these constructs are good.

Table 2: Validity and Reliability Confirmation

Variables	CR	AVE
AI-powered Data AI-driven Decision Support	0.831	0.514
Financial Returns on Investment (ROI)	0.865	0.566
Information Systems Pre-digitalization Financial Performance	0.841	0.531
Sustainable Enterprise Digitalization	0.835	0.508
System Integration	0.833	0.501

Table 3 gives the results of Confirmatory Factor Analysis (CFA) for the measured items. It shows how much each thing relates to their different builds by looking at factor loadings. AI-powered data AI-driven decision support measure is shown in 5 parts and has values ranging from 0.315-0.819. These values show a close link between the items and the hidden concept. Financial returns on investment include 5 parts. Its factor scores are between 0.587-0.846. Information systems pre-digitalization financial performance is shown with 5 things and the connection between them varies from 0.340-0.829. Sustainable enterprise digitalization includes 5 things, with factor ratings from 0.505-0.807. System integration is shown with 5 things and the connection between them varies from 0.637-0.753. These calculations show that the model is reliable, meaning observed items accurately measure what they were meant to. The results of the Confirmatory Factor Analysis show that the tests used in this study are trustworthy and accurate. This will help with future studies.

Table 3: Confirmatory Factor Analysis

Variables	Items	Loading
AI-powered Data AI-driven Decision Support	AID1	0.686
	AID2	0.819
	AID3	0.817
	AID4	0.315
	AID5	0.814
Information Systems Pre-digitalization Financial Performance	ISF1	0.829
	ISF2	0.809
	ISF3	0.340
	ISF4	0.811
	ISF5	0.737
Financial Returns on Investment (ROI)	ROI1	0.587
	ROI2	0.795
	ROI3	0.750
	ROI4	0.846
	ROI5	0.757
Sustainable Enterprise Digitalization	SED1	0.695
	SED2	0.807
	SED3	0.775
	SED4	0.742
	SED5	0.505
System Integration	SI1	0.637
	SI2	0.670
	SI3	0.724
	SI4	0.753
	SI5	0.746

Table 4 shows the results for checking if one factor is different from another. It has the average amount of stuff a thing does (AVE) on the main lines and how much one thing connects to another off-main line. The big numbers (in bold) show the square root of the average connection for each part. They prove that the square root of these connections is higher than their links with other parts. This result helps show that each idea is better connected with its own checked things than with the ideas of others. This means they are different from one another in a positive way. The discriminant validity criterion provides evidence that the measurement model has adequate discriminant validity, bolstering confidence in the distinctiveness of the latent constructs. The table shows that the values are lower than the suggested limit of 0.85 for all combinations of constructs, further confirming their differentiation. Likewise, the connections between variables pairs have been found to be 0.717, 0.752, 0.717, 729,713 and 0.708 which shows that they're unique with only a little bit of shared variation rather than their own measured properties. These results strongly support that the hidden factors in the research are clearly separate. This makes it more reliable to use the measurement model and the valid connections among all of these important parts.

Table 4: Discriminant Validity

	AI-powered Data AI-driven Decision Support	Financial Returns on Investment (ROI)	Information Systems Pre-digitalization Financial Performance	Sustainable Enterprise Digitalization	System Integration
AI-powered Data AI-driven Decision Support	0.717				
Financial Returns on Investment (ROI)	0.549	0.752			
Information Systems Pre-digitalization Financial Performance	0.967	0.535	0.729		
Sustainable Enterprise Digitalization	0.675	0.614	0.664	0.713	
System Integration	0.471	0.660	0.439	0.625	0.708

Table 5 and Figure 2 show the R-square value for Information systems pre-digitalization financial performance effects at workplaces and organizations. It tells us how much difference we can find in the outcome variable thanks to our input variables used in the building model of relationships. This means that the model explains 93.6 % of how Information systems pre-digitalization financial performance changes by using AI-powered data AI-driven decision support, Financial returns on investment, Sustainable enterprise digitalization, and System integration. The strong R-square value means that the model fits well. It shows that all factors in this study, together bring a big share towards understanding how participants see workplace productivity.

Table 5: R square

	R Square
Information Systems Pre-digitalization Financial Performance	0.936

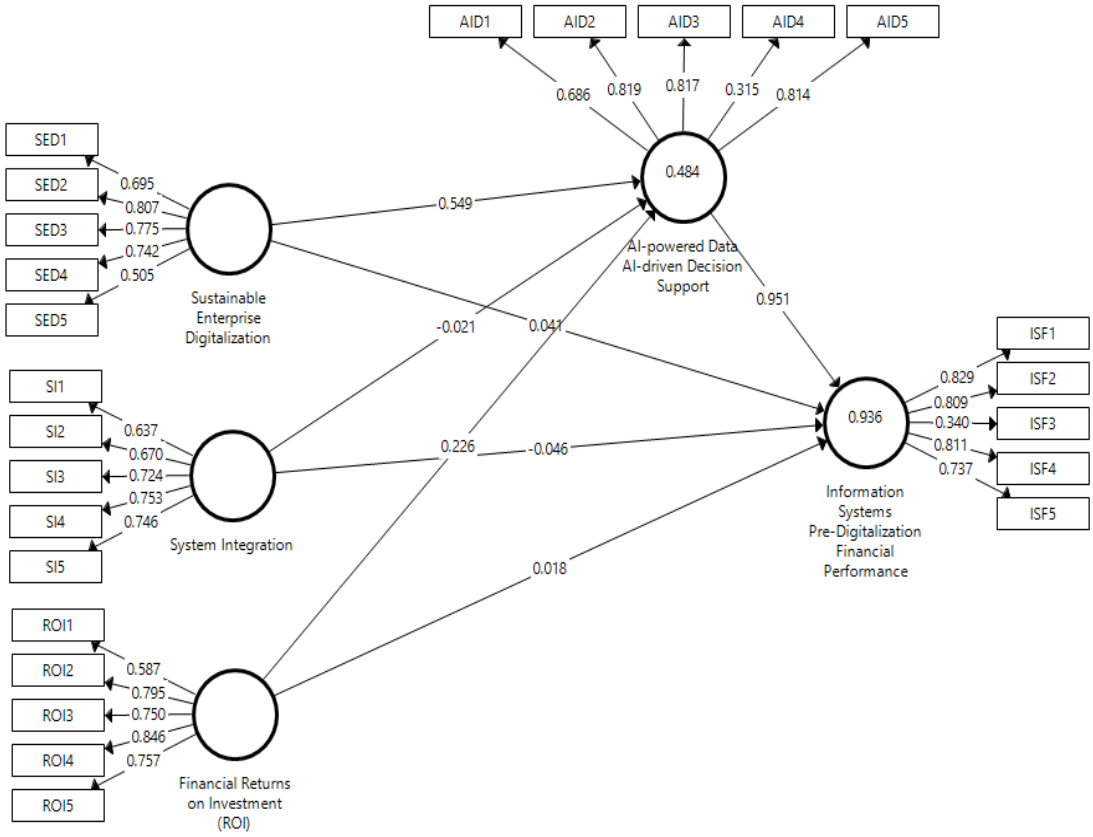

Figure 2: Measurement Model

Table 6 talks about how well the model fits. It specifically looks at the Saturated Model's Standardized Root Mean Square Residual (SRMR) value. The SRMR value of 0.112 shows a low difference between the real and expected results. This suggests that theory fits properly, just by looking at these numbers. The Saturated Model is a point of comparison for study. The SRMR score shows that the model works well in expressing links between variables.

Table 6: Model Fitness

	Saturated Model
SRMR	0.112

Table 7 and Figure 3 show the findings of the straight line study, mainly about how financial returns on investment, sustainable enterprise digitalization, and system integration affect information systems pre-digitalization financial performance respectively with P value of 0.391, 0.046 and 0.012 which means financial returns on investment affect negatively information systems pre-digitalization financial performance. The connected p-value is 0.0001, which is less than the usual importance level of 0.5. This confirms that this way has a big effect on numbers. Financial returns on investment, sustainable enterprise digitalization, and system integration affect AI-powered data AI-driven decision support respectively with P value of 0.0001, 0.0001 and 0.690, which means system integration affect negatively AI-powered data AI-driven decision support. AI-powered data AI-driven decision support affects information systems pre-digitalization financial performance with P value of 0.0001.

Table 7: Direct Path Analysis

	Beta	STDEV	T Value	P Value	Results
AI-powered Data AI-driven Decision Support -> Information Systems Pre-digitalization Financial Performance	0.951	0.016	61.132	0.0001	Accepted
Financial Returns on Investment (ROI) -> AI-powered Data AI-driven Decision Support	0.226	0.057	3.960	0.0001	Accepted
Financial Returns on Investment (ROI) -> Information Systems Pre-digitalization Financial Performance	0.018	0.021	0.859	0.391	Rejected
Sustainable Enterprise Digitalization -> AI-powered Data AI-driven Decision Support	0.549	0.054	10.244	0.0001	Accepted
Sustainable Enterprise Digitalization -> Information Systems Pre-digitalization Financial Performance	0.041	0.020	2.002	0.046	Accepted
System Integration -> AI-powered Data AI-driven Decision Support	-0.021	0.052	0.399	0.690	Rejected
System Integration -> Information Systems Pre-digitalization Financial Performance	-0.046	0.018	2.532	0.012	Accepted

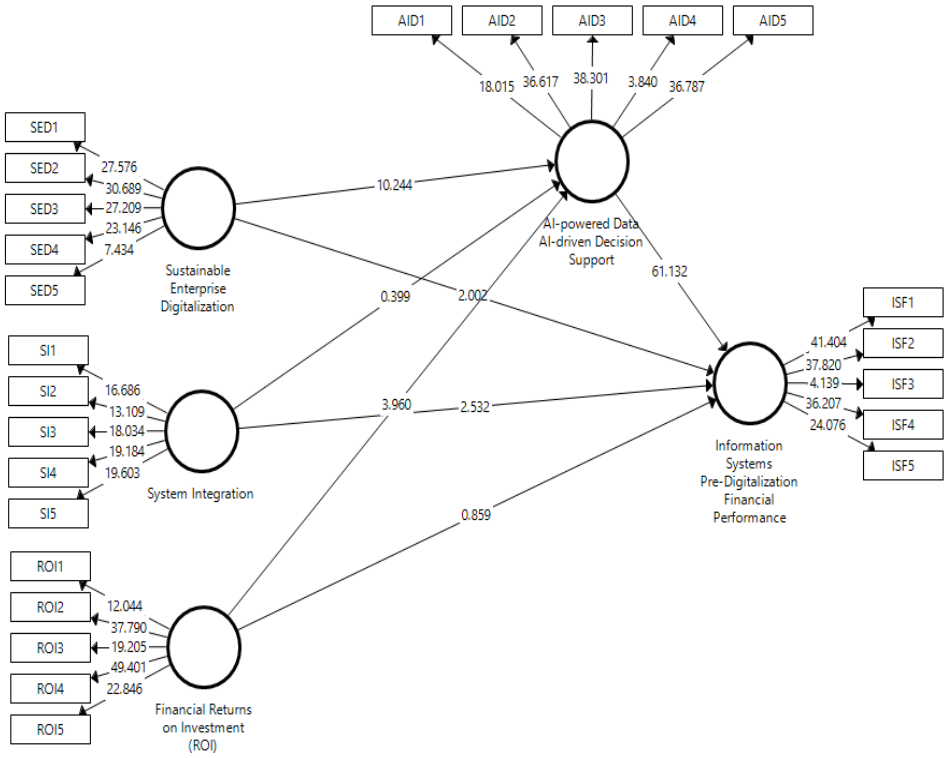

Figure 3: Structural Model

Table 8 shows the findings of the straight line study, mainly about how AI-powered data AI-driven decision support as a mediator affects financial returns on investment, sustainable enterprise digitalization, system integration and information systems pre-digitalization financial performance respectively with P values of 0.0001 0.0001 and 0.690, which means AI-powered data AI-driven decision support negatively mediates the relationship between system integration and information systems pre-digitalization financial performance.

Table 8: Mediation Analysis

	Beta	STDEV	T Value	P Value	Results
Financial Returns on Investment (ROI) -> AI-powered Data AI-driven Decision Support -> Information Systems Pre-digitalization Financial Performance	0.215	0.054	3.971	0.0001	Accepted
Sustainable Enterprise Digitalization -> AI-powered Data AI-driven Decision Support -> Information Systems Pre-digitalization Financial Performance	0.522	0.052	10.130	0.0001	Accepted
System Integration -> AI-powered Data AI-driven Decision Support -> Information Systems Pre-digitalization Financial Performance	-0.020	0.049	0.399	0.690	Rejected

5 Discussion

Smart enterprises that rely on AI systems to work on sustainable digitization initiatives through fact-finding tools also generate financial benefits while pursuing and contributing to environmental and social objectives. The list of such initiatives runs from the integration of AI algorithms with different departments to improve effectiveness, introduce cost-saving mechanisms, and eliminate the negative impacts on the environment. We will investigate them next and discuss their correlation.

The term "sustainable enterprise digitalization" stands for the conversion procedure concerning business operations into digital platforms and solutions for sustainability's sake. Efforts in this context are the reduction of a number of repetitive processes, using less wastage of paper, and saving energy resources. Companies could be able to develop AI-driven systems which could in turn maximize resource utilization, minimize waste and improve supply chain efficiency. An instance of this is AI-shaped predictive maintenance which decreases energy consumption by boosting equipment performance and this means a decrease in costs and environmental benefits due to its optimization.

Again, a host of arguments can be advanced in favor of the "financial returns on investment" in these undertakings. Although it may result in increased upfront costs, the long-term benefits are primarily supreme as they always overemphasize the initial investment. AI is capable of addressing the decision-making processes towards improved operational efficiency and costs. Likewise, AI-powered demand forecasting can help organizations to optimize their inventory, reducing surplus stock level and their associated carrying costs. Besides, AI-powered bot customer service can be used in analytics that improve the satisfaction of customers and the retention of clients which has a positive effect on the overall revenue.

In essence, "AI information systems" exhibit a significant effect on the process of digital transformation in the enterprise with regard to sustainability. Those systems consist of AI algorithms, machine learning models and data analytics instruments that are able to process great amounts of data into feedback which is useful for making proper decisions. For instance, self-aware power generation systems can perform their energy theories in real time to allow businesses to identify areas where the operations can be optimized at lower costs. Moreover, the use of an AI-distributed supply chain management system helps minimize logistics costs, lowering the amount spent on fuel and vehicle emissions.

When theoretical analysis of the financial outcomes to be met from implementing the AI information system improvement together with the digitalization of the sustainable enterprise can be done, the wider effects beyond the traditional financial metrics should also be considered. Another side of the coin is that cost reduction and profit development are probable benefits but the other points, such as risk reduction, trademark loyalty and regulation compliance, should be taken into consideration also. By way of instance, AI-based initiatives as sustainability influencers may push companies to adapt themselves to legal changes and environmental perturbations, building future-oriented businesses, thus improving their competitiveness and resilience.

Indeed, harvesting profits from sustainable enterprise digitalization processes employing AI application systems will not only help enhance financial returns, but also provide environmental and social benefits. Through utilizing robotics technologies, organizations can enhance system performance, lower costs, and lessen the environmental consequences. It enables companies to realize value not only for their shareholders but also for the society at large. Nevertheless, proper execution requires a strategy that captures the complexity of finite sources as well as environmental and social aspects.

6 Conclusion

To assess the returns on investment (ROI) on sustainable digitalization of enterprises in sourcing AI information systems needs a more exhaustive analysis of the factors. Let's delve into these aspects: Let's delve into these aspects: Prior to the beginning of the information systems, the commitment to sustainable enterprise digitalization can be made only after the evaluation of the main financial performance of the existing data management systems. The assessment of that is the identification of the digitalization improvements and efficiencies that can be brought. An environmentally friendly strategy of digital enterprise development can be described as a combination of digital technologies applications in business processes with a view to reaching sustainable development goals in the economy, society, and environment. We believe this requires investing in technologies that are not only in tune with the above two aspects but also larger environmental resilience and corporate responsibility. Digitalization projects with a high probability of success realize their process through harmonious steps of communication of different technologies and systems. For instance, integrating AI-based data analytics systems with already existing IT set up to make processes more streamlined and decisions smarter would be included in this. The primary purpose of introducing any digitalization initiative is to create additional value or to increase financial profits. They could be realized in different ways, for example, in the form of cost savings, growth in revenues improved productivity, or the rise of customers' satisfaction. One should consider the actual figure of these returns for the determination of the success rate of the planned investment. AI technologies are fundamental for green industry digital transformation as by allowing for sophisticated data analytics and decision support. AI-driven data analysis has the capacity to extract the important information contained within large data sets, consequently giving businesses a chance to be data-driven and make superior decisions that are aimed at improving operations. AI can be the base for a decision support system that can automate tasks, improve accuracy and use analytics to support long-term planning and management functions. For a balanced financial return evaluation on sustainability digitalization projects in an organization, there is a need to consider both the quantitative and qualitative effects. Instant numbers like return on investment, payback period and net present value make it easier for people to see both, the positive and negative impact of the investment on the company's finances. While it is essential that the economic impact of a green energy policy is considered, qualitative factors such as better performance of the environment, increased

competitiveness and increased innovation should be no less important. Furthermore, ongoing monitoring and evaluation are crucial to ensure that the expected financial returns are realized over time. It could get to that with the help of monitoring key ratios, regular evaluations, and engagement of different consumer groups. In the end, assessing the success of sustainable enterprise digitalization projects from the financial standpoint requires a multi-faceted analysis that involves more than just profitability before the digital transformation, but considers the entire eco-system picture including the modules that were adopted and in which manner AI systems had contributed in driving the financial results. Through such appraisal, companies are able to make clear choices and take the most advantage of digitalization among the relevant factors.

7 Implications

Practical Implications

The assessment of financial returns on sustainable digitalization efforts in the enterprise domain must be viewed as a whole. Before going digital, a holistic analysis of integrated financial performance will give us a baseline from which we'll appreciate the digital performance. Digitalization that is sustainable in business comprises a system that works well and is environmentally friendly. AI-driven data analytics supplies its data which supports making well-founded decisions about processes and resources. Implications for the practice area include more productive operations, decreased expenses, and sustainability indicators, which are higher. Nevertheless, success depends on the availability of data that are not superficial, through effective system integration and granting AI-driven decision support for important business investments. Significant financial gains of investment to be realized in the process call for prudent planning, intermittent monitoring, and steady execution throughout the journey.

Theoretical Implications

Examine the financial results of the sustainable digitization of enterprise investments that employ AI information sequences, as this involves crucial theoretical consideration. Before digitalization, conventional information systems usually achieved this effect passively as technological advancement sometimes unknowingly contributed towards garnering a stronger financial performance. But, just as this sustainable enterprise is in the process of digitization, the use of AI-powered data analytics could perhaps be considered the most breakthrough progression. In this regard, all integrate capabilities of decision support that empower businesses to improve the processes, save costs and access new income sources. On that basis, the theoretical frame expands to contain AI-enabled decision making pass-time, which enables the occurrence of timely decisions for strategic decision-making. Rather, it extends the boundary of this relationship by enabling the interlinking age of information systems with optimizing financial performances, as well as attaining sustainable growth and securing a competitive edge.

8 Limitations

The research framework seems absent in details of the selected data system variables and reasons for why they were selected for the framework, which makes it more difficult than it should be for the reader to comprehend. The researcher's expansion on why such variables were selected along with their significance will increase the understanding level. However, a theme which is missing is how the limitation of result applicability on industries or contexts was managed despite the fact that this issue

was noted. Owing to the fact that this provision will reinforce the work's validity, it bears great importance. The research, however, to some extent, does discuss the temporal issue of digital behavior and technology, but it fails to show how these were included in the methodology or analysis stage. This will make the study more rigorous by adding a factor that is well-defined.

9 Future Directions

When evaluating the financial returns on investment into sustainability enterprise digitalization using AI information systems, it is necessary to study and conduct inquiries into undesignated innovative pillars of digitalization and sustainability. The most useful sort of longitudinal studies should be devoted to certain domains, including, for example, the effect of IT solutions integration on the firms' financial performance or the impacts of AI-powered data analysis in boosting sustainable decision making. Consequently looking into topics like how companies that were digitalized before the pandemic performed financially before vs. after can reveal some meaningful actions. They will create a groundwork for the limitations but also will be a factor in getting other researchers on the train of good research.

10 Conflict of Interest

No potential conflict of interest was reported by the authors.

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