Linking Knowledge Management and Environmental Performance: A Pathway to Sustainable Competitiveness

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This study looks at how important knowledge management (KM) procedures including acquisition, sharing, storage, and application affect green innovation and help small and medium-sized businesses (SMEs) in the IT and ITES sectors grow in a way that is good for the environment. It looks at how better managing knowledge might improve social performance, environmental responsibility, and economic resilience. The study's goal is to show how important KM is for promoting innovation that supports sustainability goals, which will lead to long-term competitive advantage and responsible business practices. We used structural equation modelling (SEM) to look at the effect of knowledge management processes on green technology, green management innovation, and the environmental, social, and economic aspects of sustainability. Green innovation had a big positive effect on CSD. Dimensional analysis showed that all paths except knowledge development and acquisition had a big effect on societal sustainability. Also, managing knowledge is thought to be just as crucial for IT service companies of all sizes. No one has looked into this in the field of research previously

Keywords: knowledge management, sustainability, green management innovation, green environment, green technological innovation, organizational strategy

INTRODUCTION

In the previous thirty years, a lot has changed in the world of business because of changes in society, technology, and the environment. The internet has facilitated globalization, enabling organizations and consumers to engage in commerce globally (Cancino et al., 2018). This means that there are no more geographical limits. Customers can now choose cheaper solutions that match their needs because it is easy to talk to providers all around the world (Mardani et al., 2018). This makes it very hard for businesses to establish and keep a competitive edge. So, proactive companies apply a lot of tactics that have been proved to improve performance in order to meet customer needs and reach their long-term growth goals. Knowledge management (KM) and total quality management (TQM) are two of these methods. According to Ooi (2014), the amount of knowledge an organization has is a key factor in whether it succeeds or fails. Dynamic organizations utilize it as a tool to improve customer satisfaction and gain an edge over their competitors in the market (Attia & Salama, 2018). Over the past twenty years, KM has gotten a lot of attention in the business world. It is also known to be a key part in making plans, coming up with new products and services, and running operations smoothly. The company can become more innovative and successful by managing its knowledge well. As a result, a lot of businesses consider KM as a strategic advantage that helps them beat their competition.

People and businesses are putting more pressure on companies to stop doing things that harm the environment and start doing things that help the environment (Albort-Morant et al., 2018). The pressure indicated is a direct result of the depletion of natural resources and the growing problem of global warming. Environmental, social, and economic sustainability are the three factors that are used to measure sustainable development. The goal of environmental sustainability is to protect and exploit the natural environment and its resources in a responsible way (Patnaik et al., 2022). On the other side, social sustainability is about the health and growth of society and its people. Economic sustainability is all about the money and the long-term health of businesses. According to Xie et al. (2019), green innovation is a way for businesses to make products that are good for the environment in order to reach their goals for sustainable development. To reach this goal, businesses need to work on both technological and administrative innovation. There are two main types of green innovation: green management innovation (GMI) and green technological innovation (GTI). The goal of the GTI is to bring together knowledge of the environment with technological innovation. Companies can use GTI to make new goods or processes and make the ones they already have better. Not only does this assist save natural resources, energy, and materials, but also helps create a balanced relationship between the economy, the environment, and how things are made. The GMI helps businesses improve how they run and make things by either reorganizing how they do things or using new management systems. This, in turn, serves to reduce or get rid of bad effects on the environment (Qi et al., 2010).

Numerous scholars have examined KM and sustainable development from various perspectives; nevertheless, little investigation has been conducted to ascertain how KM might facilitate the attainment of sustainable development, particularly through environmental innovation. Numerous scholars, including Mardani et al. (2018) and Davenport et al. (2018), have shown a paucity of literature regarding green innovation, corporate responsibility, and KM. Even fewer studies have used multivariate statistics followed by structural equation modelling (SEM) to investigate the link between factors in the production and service industries and what causes them. To find an answer to this issue, this study investigates the various ways that KM, green innovation, and business sustainable development interact with each other. KM processes are also looked at in terms of how they affect green innovation and business sustainable development efforts. The researcher decided to use the size of the company and the type of industry as control variables to see how they affected the results.

LITERATURE REVIEW

In the contemporary information-centric economy, knowledge management emphasizes the effective administration of organizational knowledge assets to foster innovation, improve decision-making, encourage cooperation, and provide a lasting competitive advantage. By employing effective knowledge management strategies, organizations may leverage their intellectual assets to adapt to change, capitalize on opportunities, and prosper in a complex and dynamic business landscape. Knowledge creation is the process of converting human experiences, concepts, and information into explicit knowledge that can be disseminated and utilized within an organization. This process frequently transpires through collaborative problem-solving, new initiatives, and internal research and development within the organization. There exist two categories of knowledge: explicit knowledge and tacit knowledge. These innovations aim to diminish waste, optimize the utilization of renewable resources, and curtail the consumption of natural resources. Green product innovation seeks to reduce the environmental consequences of product disposal while enhancing energy efficiency. It accomplishes this by developing new products or modifying existing ones with renewable or non-toxic ingredients throughout production (Bolisani & Bratianu ,2018). Knowledge is a conceptual idea that is not limited to the physical realm. Explicit knowledge refers to information that can be documented, spoken orally, shared with others, and articulated (Ooi, 2014). Explicit knowledge is often conveyed via written mediums including reports, books, and manuals. Tacit knowledge is undisclosed information stored in humans' minds. It is gained via experience and social engagement (Maravilhas & Martins, 2019). Tacit knowledge is harder to convey to others compared to explicit knowledge since it is not articulated or documented (Johnson et al.,2019). Yang (2008) described

knowledge management as the conversion of tacit knowledge into explicit knowledge to facilitate knowledge transfer within an organisation.

This study uses four parts of KM: creation, acquisition, sharing, and utilization of information. Knowledge production is the process of turning people's experiences, ideas, and facts into clear knowledge that can be shared and used by everyone in an organization. This process often happens through things like working together to solve problems, coming up with new ideas, and doing research and development within the firm. Talking to other people and getting both implicit and explicit information can help you come up with fresh ideas and concepts (Lee & Wong, 2015). To continually enhance the quality of their goods and services, businesses need to collect information from their customers, employees, and suppliers. This is important since client tastes and the business world are always changing. Identifying, documenting, and organizing both tacit and explicit knowledge assets within an organization is part of the process of acquiring knowledge (Qasrawi et al., 2017). This means leveraging different technologies and methods, including as databases, document repositories, and knowledge mapping, to record best practices, lessons learned, staff expertise, and intellectual capital. Also, getting information can help companies figure out what they are good at and what they need to work on (Albort-Morant et al., 2018). Knowledge sharing is the process of making it easier for people, teams, and departments within an organization to share and receive knowledge (Jarrahi, 2018). There are official ways to do this, including meetings, training sessions, and venues for exchanging expertise. There are also unofficial ways, such communities of practice and casual connections. It is important to share what you have learned with your coworkers, especially those who work in related fields (Jarrahi, 2018). People who work for learning organizations are often told to get involved in different organizational problems. Management can look at problems from several angles and come up with good solutions when employees are engaged. In a business setting, applying knowledge is using relevant information and insights to solve problems, make smart choices, and encourage new ideas. To encourage ongoing growth and flexibility in a company, it is important to provide an environment where people may experiment, learn from their mistakes, and use their knowledge assets.

Sustainable Development Theory

Theory of sustainable development provides a comprehensive framework for reconciling economic prosperity, social equity, and environmental conservation to ensure the welfare of current and future generations (Elkington,2018). By including sustainability concepts in legislation, planning, and decision-making, societies can move toward a future that is more inclusive, resilient, and sustainable. The theory of sustainable development looks at how the economic, social, and environmental aspects of development are connected when making long-term plans. It stresses the need of addressing current needs without making it harder for future generations to meet their own needs. The goal of economic sustainability is to encourage economic growth and good use of resources while making sure that gains are shared fairly. This means using environmentally friendly ways to make and use things, encouraging new ideas and businesses, and putting money into infrastructure and people to make them more productive and competitive (Shahzad, 2019). Social sustainability focuses on fixing social problems, building community, and making sure that everyone in society is safe and happy. This means making sure that everyone has access to basic requirements like education, healthcare, housing, and social services. It also means encouraging decision-making procedures that include everyone and give power to marginalized groups to promote social justice (Guerrero-Villegas et al., 2018). To safeguard the long-term health of the planet, environmental sustainability means protecting natural ecosystems, biodiversity, and the integrity of Earth's processes. This includes reducing pollution and waste, protecting natural resources, encouraging sustainable land use and resource management, and lessening the effects of climate change.

Relationship Between Sustainable Development And Knowledge Management

KM is very important for promoting long-term growth since it helps with sharing information, creating skills, making decisions based on facts, coming up with new ideas, working together across sectors, and building resilience. KM is important for reaching goals for sustainable development because it helps people use knowledge and information effectively to solve problems related to the environment, society, and the

economy (Lim et al., 2017). Using knowledge and information, organizations and stakeholders may work together to solve problems related to sustainability and create a better, stronger, and more sustainable future for everyone. Knowledge management encourages the sharing of best practices, lessons learned, and creative solutions to help long-term growth. By encouraging stakeholders to share knowledge, organizations may be able to better deal with sustainability issues by finding and using successful techniques. It helps people and organizations acquire their skills, knowledge, and experience so they can support sustainable development. Communities of practice, training programs, and knowledge-sharing platforms help people keep learning and improving their skills in areas like environmental protection, renewable energy, and social equity. Knowledge management makes it easier for diverse areas and industries to share new technologies and best practices, which helps efforts to promote sustainable development (Stanovcic et al., 2015). Using knowledge networks, collaborations, and collaborative platforms, organizations may speed up the use of sustainable technology and practices in clean energy, water management, and waste reduction. It encourages people and businesses in various fields to work together to solve complicated problems related to sustainability. By sharing information, resources, and skills, stakeholders can work together to reach common sustainability goals more effectively.

H1:*KM has positive impact on Business Sustainability (BS)*

Green Innovation (GI)

"Green innovation" is the process of making and using new products, services, processes, and technologies that help the environment by lowering greenhouse gas emissions, protecting natural resources, and cutting down on pollution (Li et al., 2017; Rossiter & Smith, 2018). It also helps with sustainable development. GI frequently includes the creation and use of modern technologies, such as renewable energy systems, energy-efficient devices, sustainable materials, and eco-friendly building designs, to solve environmental problems and provide long-term solutions. GI's goals are to improve the health of communities, create jobs, and deal with important environmental problems (Fernando et al., 2019). GI wants to promote sustainability by making sure that people's current demands are met without hurting the ability of future generations to meet their own needs. It focuses on cradle-to-cradle design methods, using renewable resources, and circular economy ideas to reduce the environmental impact of products and services over their entire existence (Albort-Morant et al., 2016). It uses both environmental science and technology to make the bad effects of business activities less bad and to come up with new or better goods or processes. Green process innovation (Xie et al., 2019) aims to improve the steps that turn raw materials into useable products. The goal of these changes is to reduce waste, make better use of renewable resources, and use less natural resources. Green product innovation seeks to reduce the environmental consequences of product disposal while enhancing energy efficiency. It accomplishes this by developing new products or modifying existing ones with renewable or non-toxic components during the production process (Zhang et al., 2019). These enhancements allow businesses to reap financial rewards while guaranteeing a reduction in environmentally risky operations. KM is crucial to the innovation processes since it establishes the groundwork for investigations and analysis. the effect of KM on organisational innovation and found that it stimulates firms' innovative endeavours (Sesay et al., 2018). Many managers think that the relationship between an organization's social sustainability and performance is mediated by innovative initiatives (Guerrero-Villegas et al., 2018). In order to foster green innovation, the government should assist, encourage, and enable businesses to innovate since it will allow them to create high-quality products and services with the least amount of natural resource consumption. In light of the conversation on knowledge management, green innovation, and corporate sustainable development that was just had, the following theories are put forth:

H2:*KM has positive impact on Green Innovation*

H3: *Green Innovation has significant impact on corporate sustainable development (CSD)*

Knowledge Creation (KC)

Knowledge creation occurs through the interaction between existing knowledge and the process of acquiring knowledge, which involves action, practice, and engaging with others (Maravilhas & Martins, 2019). It is essential for fostering green innovation and corporate sustainable development by creating new ideas, technology, and solutions that tackle environmental issues and support long-term sustainability (Habib et al., 2019). Companies need to put enough money into making fresh information so they can enhance their ability to innovate and make new technologies. Research and development are driven by the need to create new technologies, goods, and processes that are better for the environment and help the world become more sustainable. Companies should look into creative ways to solve pressing environmental problems including renewable energy, waste reduction, and resource efficiency by putting money into research and development (Chatzoudes et al., 2015). It encourages people and groups to come up with new ideas, try out different approaches, and think outside the box. Companies may promote green innovation and inspire staff to come up with new ways to solve environmental problems by creating an environment that values curiosity, exploration, and experimentation. It lets people with different interests, such scholars, practitioners, policymakers, and community members, share and transfer knowledge (Lucas, 2019). By sharing research results, best practices, and lessons learned, organizations may speed up the adoption of environmentally friendly technologies and practices and promote learning and cooperation among their members. It helps capacity development projects that aim to strengthen the skills, knowledge, and abilities of people and groups working in the sustainability field. By giving its employees training, education, and professional development opportunities, companies may provide them the power to drive innovation, use sustainable practices, and help the company reach its sustainable development goals (Albort-Morant et al., 2018). It encourages open innovation strategies that involve collaborating with outside partners such as suppliers, customers, research institutions, and non-profits to come up with solutions to sustainability problems. Companies can use the knowledge and skills of different stakeholders to gain fresh ideas, perspectives, and resources that support green innovation and long-term business success (Tseng, 2014). These groups encourage and help the creation of eco-friendly products while always checking how their actions affect the environment. So, we can recommend the following options:

H4a: *Knowledge Creation have significantly impact on Corporate Environmental development (CEND).*

H4b: *Knowledge Creation have significantly impact on Corporate Social development (CSD).*

H4c: *Knowledge Creation have significantly impact on Corporate Economic development (CED).*

H4d: *Knowledge Creation have significantly impact on Green Innovation*

Knowledge Acquisition (KA)

Knowledge acquisition is the organisational process of obtaining, extracting, and structuring knowledge from many sources (Attia & Salama, 2018). Most employees gain information from internal sources, such as team members and colleagues. Organisations can obtain and learn from best practices in sustainability from industry peers, research institutions, and case studies. By learning from proven solutions, organizations may copy successful sustainability efforts, avoid common mistakes, and speed up the adoption of green innovation. It gives businesses information about the sustainable market, such as new trends, what customers want, what regulations they need to follow, and how competition works. By keeping up with market trends, businesses may find new ways to be environmentally responsible, guess what customers will want in the future, and adjust to changes in the law. Learning more about green technologies, ideas, and solutions from outside sources including research institutes, technology providers, and industry partners (Mothe et al., 2017) makes it easier to move them around. By learning about the latest technologies and best practices and using outside experts and resources, organizations may be able to come up with and carry out more successful long-term solutions. It helps build cooperative partnerships and linkages with stakeholders who are involved in sustainability, such as government agencies, non-profit organizations,

universities, and industry groups. Companies can use partnerships with other organizations to get a lot of information, expertise, and resources that they can use to work together to come up with new ideas, solve problems, and promote sustainability through their combined efforts. To get information, you need to ask experts, advisors, and consultants that know a lot about sustainability issues for help. When organizations talk to experts, they can get important information, ideas, and suggestions for their plans and actions related to green innovation. The purpose of gaining knowledge is to understand what customers want and how they use the products and services of a business (Wijethilake, 2017). To keep customers happy, businesses make the changes they need to, which leads to better economic sustainability (Shahzad et al., 2019). An organization's ability to get and use information has a positive effect on its financial success. Sztangret (2017) emphasised that enterprises need to apply learned knowledge in their operations to accomplish sustainable development goals. Therefore, the following possibilities can be suggested:

H5a: *Knowledge acquisition have significantly impact on Corporate Environmental development.*

H5b: *Knowledge acquisition have significantly impact on Corporate Social development.*

H5c: *Knowledge acquisition have significantly impact on Corporate Economic development.*

H5d: *Knowledge acquisition have significantly impact on Green Innovation.*

Knowledge Sharing (KS)

Knowledge sharing is the transmission of explicit or tacit knowledge to an individual or group of people (Jarrahi, 2018). Knowledge sharing is spreading knowledge, expertise, ideas, and experiences among individuals, teams, and organisations to improve learning, cooperation, and problem-solving. Knowledge sharing allows organisations to distribute successful environmentally friendly initiatives, cutting-edge technologies, and sustainable practices within and outside the organisation (Attia & Salama, 2018). Organisations can expedite the adoption of eco-friendly solutions by exchanging best practices, learning from one other's experiences, and avoiding duplication of efforts (Bolisani & Bratianu, 2018). It grants access to specialised knowledge, research discoveries, and resources that might not be easily accessible within a company. Organisations can acquire insights on upcoming trends, technology, and regulatory changes in environmental sustainability by accessing external knowledge networks. Sharing knowledge fosters the growth of innovative ecosystems centred on green technology and sustainable development. Innovation ecosystems facilitate the development of new green technologies and business models by promoting an open flow of ideas and collaboration among entrepreneurs, academics, investors, and policymakers (Khodadadi & Feizi, 2015). Learning organisations share their experimental results publicly to foster collective innovation and a mutually beneficial culture, allowing other organisations to utilise the material for creative endeavours (Al-Busaidi & Olfman, 2017). Several organisations disclose the specifics of their production procedures to promote transparency and establish confidence with customers. Thus, the following hypothesis are suggested:

H6a: *Knowledge Sharing have significantly impact on Corporate Environmental development.*

H6b: *Knowledge Sharing have significantly impact on Corporate Social development.*

H6c: *Knowledge Sharing have significantly impact on Corporate Economic development.*

H6d: *Knowledge Sharing have significantly impact on Green Innovation*

Knowledge Application (KAP)

Knowledge application is the utilisation of acquired knowledge in creating or providing organisational products and services. It is regarded as companies' prompt adaptation to operational changes using

technology and strategy, and their capacity to capitalise on them to create new products and services (Bar~ao et al., 2017). It entails putting into action sustainable practices, policies, and initiatives informed by knowledge acquisition of best practices. By applying this knowledge, organizations can integrate environmental considerations into their operations, supply chains, and business processes to minimize environmental impact and promote sustainability. It encourages the use of new discoveries and technology that are good for the environment that come from research and development efforts. By using creative solutions like renewable energy technologies, resource-efficient methods, and eco-friendly products, businesses can have less of an impact on the environment and be more sustainable. Using knowledge is an important part of helping businesses grow their core skills and do better in the economy. Companies may considerably improve their performance by using knowledge to find new ways to do things. Applying knowledge facilitates ongoing enhancement endeavours by allowing organisations to refine their sustainability projects through feedback, performance data, and insights gained. Organisations can enhance corporate sustainable development goals by continuously improving processes to uncover possibilities for optimisation, innovation, and efficiency advantages. Dynamic organisations prioritise stakeholders' interests by implementing eco-friendly practices and incorporating both current and new information into research and development efforts to introduce innovative processes and technologies (Mardani et al., 2018). This allows companies to create top-notch products while minimising resource consumption, benefiting both the environment and the organisation.

H7a: *Knowledge Application have significantly impact on Green Innovation.*

H7b: *Knowledge Application have significantly impact on Corporate Environmental development.*

H7c: *Knowledge Application have significantly impact on Corporate Social development.*

H7d: *Knowledge Application have significantly impact on Corporate Economic development.*

RESEARCH METHODOLOGY

The study focuses on small and medium-sized IT companies located in the SEZ in Pune district. This study focuses on Small and Medium-sized Enterprises (SMEs) because Large Cap IT organisations actively support KM in their culture, which is not the case for SMEs. The study utilised non-probability convenience sampling due to the challenge of obtaining an unlimited population size from the employee databases of the organisations. The data was gathered from Talwade, Hinjewadi, Balewadi, Eon Free Zones, and Magarpatta City. The researcher contacted junior, middle, and senior managers of the firms in person and electronically, asking them to assess their organization's performance in KM, green innovation, and Corporate sustainable development activities using a five-point Likert scale. The data was exclusively gathered from management workers due to their possession of precise and current information regarding both organisational policies and practices. Managers are tasked with disseminating and enforcing organisational policies in their departments. Data was gathered from September 2023 to June 2024 using the non-probability convenience sampling method. Out of 213 valid responses, 148 came from small organisations and 65 from medium-sized organisations. Additionally, there were 146 male responders and 67 female respondents.

A set structure was used to create a questionnaire to gather data for the analysis. The instrument has four separate parts. First, the respondents' demographic information was shown, such as their gender, the type of industry they worked in, and how long they had been working. There were 19 things in the second segment that were related to the four stages of knowledge management. The tool has 4 items for creating knowledge, which came from Darroch (2003); 5 items for getting knowledge, which came from Wang et al. (2008); and 5 items for both sharing knowledge and getting knowledge, which came from Lee and Wong (2015). The third part of the tool talks about the environment, society, and the economy as three parts of sustainable development. Four things are utilized to judge each dimension, and these things come from

Bansal (2005) and Turker (2009). The fourth portion addressed the two components of green innovation: GTI and GMI. These are categorized under the designation of Green Innovation. These 6 items were extracted from Wong (2012).

TABLE 1
DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Description	Value	Percentage
Small Scale Industry	148	69.48%
Medium Scale industry	65	30.52%
Industry Type		
Manufacturing	123	57.75%
Services	90	42.25%
Gender		
Male	146	68.54%
Female	67	31.46%
Years of Experience		
Upto 5 Year	23	10.80%
5-10 Years	95	44.60%
11- 15 Years	79	37.09%
Above 15 Years	16	7.51%

The researcher employed SPSS v.21 and AMOS v.23 to analyse the gathered data. To do multivariate analysis, the researcher must verify the sample's adequacy and the absence of multicollinearity. A minimum sample size of 200 is necessary to conduct factor analysis (Hoetler, 1983). The current study includes 213 respondents, so meeting the minimal sample size requirement. The variance inflation factor (VIF) was utilized to evaluate multicollinearity, yielding a result of 1.53, which signifies the absence of multicollinearity in the data set. The researcher conducted confirmatory factor analysis (CFA) to evaluate the measurement model. CFA guarantees the validity and one-dimensionality of the measurement model (Hinkin, 1998). The measurement's reliability was assessed using Cronbach's alpha, yielding a value of 0.901. This totally adhered to the minimal value of 0.8 (Peterson, 1994). The researcher assessed the validity using convergent and discriminant validity tests. Convergent validity can be accessed via factor loading and the optimal loading should be above 0.6 (Awang, 2012). The minimum average variance extracted (AVE) for all constructs must exceed 0.5 (Molina et a., 2007). The results of convergent validity indicated that item loadings exceeded 0.6 and the AVE values for all constructs were greater than 0.5.

Table 2 delineates the particulars of item loading, together with the Average Variance Extracted (AVE) values and composite reliability.

TABLE 2
INSTRUMENT'S RELIABILITY AND VALIDITY

Constructs	Items	Factor Loding	Composite Reliability	AVE
Knowledge				
Creation	4	0.721-0.915	0.803	0.591
Acquisition	5	0.716-0.892	0.865	0.613
Sharing	5	0.706-0.938	0.913	0.656
Application	5	0.735- 0.934	0.943	0.681
Sustainability				
Environmental	4	0.711-0.918	0.809	0.745
Economic	4	0.831-0.935	0.865	0.672
Social	4	0.703-0.921	0.837	0.634
Green Innovation	6	0.712-0.898	0.812	0.632

Six indicators that assess the adequacy of a measurement model are chi-square to degrees of freedom ($\chi 2/df$), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normative fit index (NFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The researcher additionally incorporated the Tucker-Lewis index (TLI) to further validate the fitness of the measurement and structural model. The findings revealed that the $\chi 2/df$ ratio for the measurement model is 1.219 which is being less than 3, the recommended value. The RMSEA value is 0.062, which adheres to the maximum recommended value of 0.08. The values of NFI, AGFI, GFI, CFI, and TLI exceed the optimal threshold of 0.9 as suggested. Based on these results, it can be asserted that both the measurement and structural models align impeccably with the gathered data. The specifics of the measurement and structural models are shown in Table 3.

TABLE 3
MODEL FIT MEASURES

Goodness of Fit Measures	Recommended value	Measured Model
CMIN/DF	≤3	1.129
NFI	≥0.9	0.929
GFI	≥0.9	0.908
AGFI	≥0.9	0.916
CFI	≥0.9	0.945
TLI	≥0.9	0.963
RMSEA	≤0.08	0.062

Hypothesis Testing

TABLE 4
RESULTS OF HYPOTHESIS TESTING

Hypothesis	Constructs	Estimates	p- value	Decision
H1	KM → BS	0.261	0.001	Accepted
H2	KM → GI	0.258	0.008	Accepted
H3	GI → SD	0.345	0.002	Accepted
H4a	KC → CEND	0.357	0.001	Accepted
H4b	KC → CSD	0.021	0.08	Not Accepted
H4c	KC → CED	0.265	0.005	Accepted
H4d	KC → GI	0.269	0.002	Accepted
H5a	KA → CEND	0.195	0.007	Accepted
H5b	KA → CSD	0.103	0.09	Not Accepted
H5c	KA → CED	0.245	0.009	Accepted
H5d	KA → GI	0.253	0.011	Accepted
H6a	KS → CEND	0.279	0.001	Accepted
H6b	KS → CSD	0.189	0.011	Accepted
H6c	KS → CED	0.231	0.026	Accepted
H6d	KS → GI	0.253	0.021	Accepted
H7a	KAP → CEND	0.202	0.038	Accepted
H7b	KA P → CSD	0.198	0.044	Accepted
H7c	KAP → CED	0.171	0.041	Accepted
H7d	KA P → GI	0.249	0.003	Accepted

An SEM analysis was performed on the hypotheses that were developed by the researcher. It was easier to validate path hypotheses when the value of the statistical significance of each structural parameter was taken into consideration. With a β-value of 0.261 and a p-value of 0.001, the findings of the study suggested that there is a substantial impact of KM on BS. Additionally, it has been demonstrated that knowledge management has a noteworthy and favourable influence on green innovation, as evidenced by the statistically significant results of β=0.258 and p = 0.008. The same can be said for green innovation, which has also been shown to have a considerable impact on CSD, with a β-value of 0.345 and a p-value of 0.002. It can be concluded that the hypotheses H1, H2, and H3 are correct. Following the examination of the sub-hypotheses, it was found that all of the path coefficients, with the exception of H4b, and H5b, provided an explanation for the statistically significant results and were therefore accepted.

DISCUSSION AND IMPLICATIONS

This study looks at how knowledge management, green innovation, and corporate sustainability development all work together in a complicated way. Real-world studies show that knowledge management has a big and good effect on the long-term growth of businesses. Chen et al.'s (2015) study on the link between sharing information and sustainable business growth is important to this conversation. This backs up Lutchen's (2018) claim that getting employees to share information can help businesses do better financially. The results show that the organizations in India that were assessed are making good use of their knowledge resources. The management is very dedicated to knowledge management and encourages people to make, get, share, and use knowledge to reach their goals for sustainable development. The study that looked at how information management affects green innovation found substantial outcomes. This means

that knowledge management can support attempts to make the environment better. The results of this study are in line with those of Yusr et al. (2017), which found that managing knowledge makes it much easier for businesses to create new goods. The knowledge management system helps employees work together and share information that is specific to their jobs. Working together lets employees receive information from other sources, but it takes a lot of study and growth. They might use what their coworkers have taught them to build technologies that are better for the environment. The results show that environmentally friendly innovation has a big and positive effect on the growth of business sustainability. Yu and Huo (2019) and Xie et al. (2019) did studies that showed that green innovation helps businesses make more money. This discovery is similar to those results. Green innovation leads to the creation of new technologies and methods that help businesses become more environmentally friendly and financially stable. In developing nations such as India, where the natural environment has been significantly compromised due to inadequate industrial practices and waste management, it is imperative.

KC promotes innovation, enabling enterprises to develop high-quality products and services at lower costs while conserving natural resources. By achieving environmental sustainability, organizations can improve consumer happiness and loyalty, leading to economic sustainability. An analysis of KC activities found no substantial impact on CSD. This contradicts Brix (2017), which found a favourable correlation between organizational knowledge creation, learning, and social performance. This shows that the sampled enterprises are not allocating enough time and resources to create new knowledge that can advance social growth. The management of sampled firms should review their knowledge generation and social sustainability initiatives. The analysis of knowledge acquisition revealed a considerable positive influence on the environment, economic sustainability, and GI of sampled firms. Sztangret (2017) found that knowledge acquisition considerably improves organizational capacities, including environmental and financial performance. This study shows that firms prioritize knowledge development to enhance product and service quality, leading to economic sustainability. These organizations effectively apply their knowledge for social development activities. Shahzad et al. (2019) found no significant correlation between knowledge acquisition and social sustainability, suggesting that most organizations are not prioritizing knowledge acquisition to enhance their social contribution and become a leading socially responsible organization.

Sharing knowledge has a good impact on all SD practices. This validates Habib et al.'s (2019) discovery that information sharing enhances worker creativity and corporate financial performance. Research indicates that sampled enterprises prioritize information exchange within and outside their organizations. Dynamic organizations continuously train personnel and promote information sharing. Employees in such firms view information sharing as a societal responsibility, leading to increased loyalty and customer satisfaction. All SD procedures were significantly affected by knowledge application. Kopnina (2015) revealed the significance of training, learning, and knowledge application in organizational SD. The results show that sampled organizations prioritize knowledge application for sustainability. This indicates that knowledge management is equally vital for organizations of all sizes to attain economic and environmental sustainability. It also suggests that firm size does not significantly influence organizational capacity for GI.

Recently, the Indian government has enacted significant regulations and investments to advance environmentally sustainable business practices. These endeavours entail the development of sustainable technologies and related advancements. The results demonstrate that the surveyed companies are successfully employing eco-friendly innovations to achieve sustainable development.

IMPLICATION

Specifically, the current research has a variety of consequences for businesses in the IT industry. In the first place, it emphasises the connection between KM and BS, and it describes how knowledge management methods make it easier for organisations to accomplish their sustainable development objectives. According to the findings of the study, for organisations to achieve sustainable development, they should make sure that all KM processes are implemented. In the second place, the current research sheds light on the significant part that GI plays in enabling organisations to achieve sustainable development through

organisational KM. Companies that engage in GI are those that offer new technologies that enable their employees to manufacture products and services that are both environmentally friendly and of high quality, so contributing to the sustainability of both the economy and the environment. The current study gives managers of SMEs the confidence that they may achieve the same level of corporate sustainable growth by reaping the same benefits from KM as large businesses do. There are also several theoretical implications that may be drawn from this work. To begin, this study contributes to the tiny body of literature that exists about the connection between KM, CSD, and GI. The study examines the inadequately studied multidimensional relationship between KM and CSD based on KM theory and sustainable development theory. Additionally, it sheds light on the significant role that green innovation plays in the connection between KM and sustainable development, which was previously unexplored in the field of research. It is also important to note that this study emphasises the significance of applying all four dimensions of knowledge management to improve green innovation skills and accomplish sustainable development priorities (Xie et al., 2019).

LIMITATIONS

The present study possesses several limitations. The researcher gathered data exclusively from lower and intermediate managers, neglecting high management personnel; yet their perspectives could provide useful information. Therefore, future researchers should incorporate them to further investigate the subject. Secondly, the data was gathered by soliciting managers to implement the study instrument in relation to their organizational operations; hence, the collected data reflects managers' perceptions, which may introduce bias. While the author has assessed the reliability, the influence of biases cannot be entirely dismissed. Therefore, in the future, academics should use organizational factual data, such as annual financial reports, with managers' perceptions. The data for the present study was gathered from companies situated in Pune city. The researchers advocate for the expansion of the study's scope to encompass additional cities and nations.

CONCLUSIONS

This research employed the principles of KM and SD theory to examine the multifaceted interaction among KM, GI, and CSD. The researcher examined the influence of four knowledge management strategies—knowledge Creation, acquisition, sharing, and application—alongside three sustainable development practices—environmental, social, and economic sustainability on GI and CSD. The results indicate that KM significantly influences organizational green innovation and CSD performance, while green innovation notably affects CSD. Furthermore, apart from knowledge creation, which demonstrated an insignificant effect on social sustainability and knowledge acquisition, which showed an insignificant effect on social sustainability, all dimensions of KM exhibited a significant impact on green innovation and CSD of service firms in India.

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