

Reliability of Knowledge Service Provider Attributes to Achieve Innovation in Green Products: An Analytical Study

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Abstract

The current "study aimed to measure the reliability of knowledge service provider attributes of (Knowledge Embeddedness, knowledge distance) to achieve the innovation in green products of (Green Design, Green Operations) with a sample of employees of Al-Aitihad Industrial Company in Babylon Governorate, which included the study sample of the company's two employees (131) employees, Therefore, the problem of the study was formulated on the extent to which the characteristics of the knowledge provider to achieve innovation in green products in the research company. In order to achieve the study's objectives and indicate its problem, a hypothetical scheme was built to clarify the correlation and impact relationships between the study variables, and to elaborate on the formulation of special hypotheses measured in the statistical package of the program. (AMOS.V.27), also used a set of statistical methods of confirmatory working analysis, Cronbach's-alpha coefficient, and determination coefficient (R2), natural distribution of data, and descriptive statistics of computational medium and standard deviation, The results of the study showed the industrial company's awareness of the importance of attention to knowledge service provider attributes and innovation in green products to improve the performance of its work and preserve the environment. In addition to the company's interest in following environmental guidelines to instruct customers to pay attention to the environment and control the devices and tools that preserve the environment, as well as encouraging customers to take responsibility for their" actions.

Keywords: Knowledge Service Provider Attributes, Innovation in Green Products, Knowledge Embeddedness, Knowledge Distance, Green Design, Green Processes.

Introduction

Green marketing is the basis of the traditional marketing mix, but its exposure to criticism has led organizations to move towards innovation in green products, leading them to focus on green design and green processes in the production of goods and services. This prompted organizations to enlist the help of employees to participate in all marketing decisions related to the innovation of green products, and to take advantage of the knowledge characteristics of the company's employees in order to ensure that businesses' commitment to constantly developing their products is improved. Ensure the use of environmentally friendly products that do not harm the natural environment, and market actions that ensure social responsibility towards the company in particular and society in general by adhering to controls and procedures for the production of green products (Hashem & Al-Rifai, 2011).

Green product innovation is also an important pillar, through the knowledge characteristics shown by the enterprise on all its products, directing customers to buy and use the products in the right way, so that customers clearly realize the importance of using the products carefully, The knowledge provider's characteristics are a set of marketing tools used by organizations to achieve their continued and growing marketing objectives in a volatile and rapidly changing world in an unstable environment (Pee & Chua, 2016). Hence the current study highlights the importance of the provider's cognitive characteristics of (embodied knowledge, cognitive distance) to the innovation of green products (green design, green processes).

Part one: "Methodology of Study"

First: "The Problem of Study"

Developments made by the environment in recent years have significantly affected customers' tastes and requirements. Creating a significant gap between the organization's ability to meet customer requirements and satisfaction. What requires organizations to focus on innovation in green products in order to dominate different market requirements, This in turn needs high cognitive characteristics capable of the front and containing the requirements of customers and working to satisfy them as much as possible. As well as gain customer satisfaction and loyalty towards products that are offered in the market, Hence, meeting the requirements of customers represents the first line of Etihad, The problem of the study could therefore be formulated in the light of a fundamental question of (What degree of reliability does a company consider with knowledge provider characteristics for innovation in green products?). the following sub-questions arise from this question:

1. What is the level of concern of the company with the knowledge of the service provider represented in (Knowledge Embeddedness, distance knowledge)?
2. What level of green product innovation can the company offer to consumers?.
3. What is the effect of the knowledge service provider attributes on innovation in green products for consumers?.
4. What is the reality of the knowledge service provider attributes as seen by the customer in the field of study?.

Second: The Importance of Study

The importance of the study highlights the importance of its variables the characteristics of a knowledge service provider, innovation in green products, as well as this study is important being about the characteristics of a knowledge service provider, and innovation in green products in order to guide customers towards preserving the environment. The importance of the study is also highlighted in Recognize the concept of knowledge provider characteristics by enhancing the customer's trust in the company.

Third: The Objectives of Study

The current study's goals include identifying the issue, the significance of the study factors, and the favorable effects they may have on the sample under investigation, as well as a number of key elements that can be summed up as following:

1. Recognize the reality of the knowledge service provider attributes as perceived by the customer in the company in the field of study.
2. Demonstrate the correlation and impact between the service provider's knowledge attributes and innovation in green products.
3. Demonstrate the knowledge service provider attributes and innovation in green products, as well as identify the most important ingredients and problems to achieve them.

Fourth: Hypothesis Outline of Study

Based "on the problem, importance and objectives of the study described above, here is the role to explain these steps by developing a hypothesize scheme for study variables (attributes of the knowledge service provider), which has been adopted by the standard made. (Zhou et al., 2018) to measure these attributes, and (innovation in green products) as the dependent variable that has been adopted (Zaawwi, 2022) to measure these" products, as shown in Figure 1.

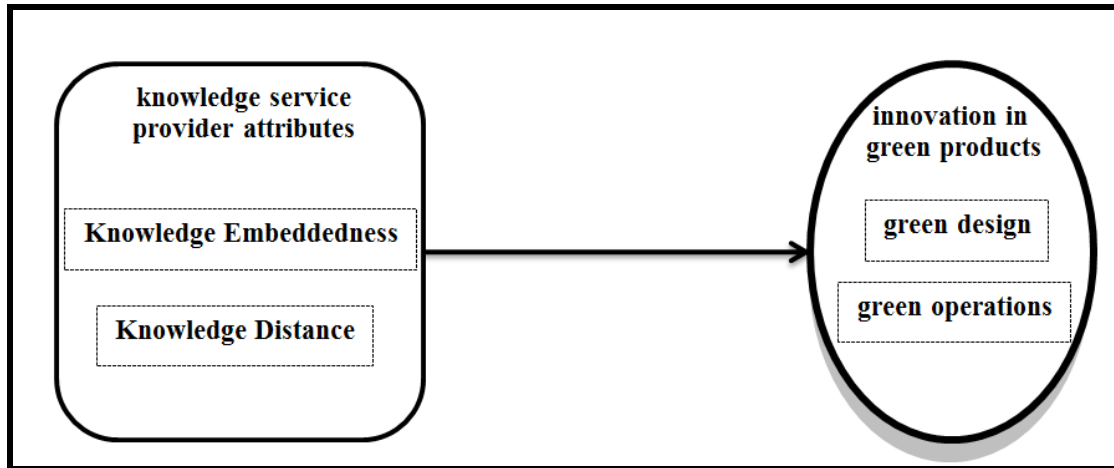


Figure 1: Study Hypothesis Chart

Source: By the Researcher

Fifth: Study Hypotheses

Key Hypothesis 1: The existence of a correlation between the knowledge service provider attributes and innovation in green products contributes to the improvement of the reality of Al-Ittihad. Two hypotheses are:

- 1.The correlations between Knowledge Embeddedness and innovation in green products in its dimensions (product design, green processes) contribute to improving the reality of Al-Ittihad.
- 2.The correlation between knowledge distance and innovation in green products with its dimensions (product design, green processes) contributes to the improvement of Al-Ittihad's reality.

Key Hypothesis 2: The impact of the service provider's knowledge attributes on innovation in green products contributes to a significant improvement in Al-Ittihad. Two hypotheses are:

- 3.The impact of Knowledge Embeddedness on innovation in green products in its dimensions (product design, green processes) contributes to significant improvement in Al-Ittihad.
- 4.The impact of distance knowledge on innovation in green products in its dimensions (product design, green processes) contributes to significant improvement in Al-Ittihad.

Sixth: Society and Study Sample

The study community is represented in all employees of the Federation Food Industries Company, located in Babylon Governorate, where (153) identification was distributed, and (139) retrieved. After disaggregating the data, the analytical questionnaires reached (131) resolution, equivalent to (85.62%) response ratio, and table (1) shows the axes of the study variables.

Table 1: Study Variants

	Dimensions	Paragraphs	Symbol	
knowledge service provider attributes	Knowledge Embeddedness	4	KE	KSPA
	Knowledge Distance	4	KD	
innovation in green products	green design	4	GD	IIGP
	green operations	4	GO	

Part Two: Theoretical Aspect

First: The Attributes of the Knowledge Service Provider

1. Concept of Knowledge Service Provider Attributes

Referring to the specific knowledge attributes within an organization that focus on knowledge of its underlying and explicit types, the attributes of the knowledge provider directly affect the performance of the organization by improving the strategic results of innovation by investing in and sharing new knowledge and building and developing the organization's underlying technical capabilities (Zhou et al., 2018). Defining (Yaakub et al., 2020) knowledge service provider attributes is vital because of the dynamic nature of knowledge development and creation. have demonstrated (Sun & Li, 2017) that the attributes of the knowledge provider determine the degree of the organization's characteristics through highly self-reliant expert group assessments in achieving its objectives.

The attributes of the knowledge provider relate to the positive outcomes of the decision discussion within the team, and this should be aligned essentially with the nature and type of message of the organization (Edmondson & Harvey, 2018). Consider that (Kurniawati et al., 2016) the knowledge service provider attributes are causal ambiguity, proof, distribution, right of ownership, and public knowledge. The study showed that (Pee & Chua, 2016) the knowledge service provider attributes are useful for determining the impact of the various contributions made by the organization to meeting market needs on the contribution of knowledge, the duration, frequency, and diversity of such contributions.

Based on the above, the knowledge service provider attributes can be viewed as the degree of characteristic of the organization through the investment, sharing, capture and application of knowledge with a view to improving its potential in designing environmentally friendly products.

2. Dimensions of Knowledge Service Provider Attributes

The "attributes of knowledge represent the specific state of knowledge within an organization. Previous studies of these traits focused on implicit and explicit knowledge, or the inclusion of knowledge, the integration of knowledge, and the distance of knowledge. Many previous studies suggest that changing the traits of knowledge can have a profound impact on the company's performance, particularly on the strategic results of innovation. Zahra and George (2002) considered that attributes from the sources of knowledge can determine the extent to which companies identify and integrate new knowledge. along with ancient knowledge, in innovative activities. The attributes of knowledge also affect the success of knowledge transfer. As they play an important role in the formation and development of organizations' core technical capabilities, researchers are paying limited attention to how these attributes will affect the acquisition of additional innovative value (Majeed et al., 2022). In order to address this gap, two dimensions have been adopted to measure the knowledge attributes of the service" provider:

- 1. Knowledge Embeddedness:** "Today, more business organizations are fully aware of the social and environmental pressures brought about by the technological revolution, which is smart, highly expanded and focused on the environment, thus creating the need to encourage people to innovate with more ideas through the knowledge they embody. Innovating is one of the key ways in which organizations can achieve sustainable growth and, in particular, knowledge and technological success (Lin et al., 2018), embodying Polanyi's first addressed in sociology (Polanyi, 1994), and indicating an understanding of social structural literature, building relationships, building the requirements of the organization and analyzing them to achieve the goals of the organization" (Santos et al., 2021).
- 2. Knowledge Distance:** Knowledge distance contributes to the performance of the organization's open creativity by investing it as a hub for knowledge sharing among relevant parties within the organization. Organizations with a higher knowledge distance usually have less overlap in knowledge and their knowledge resources more diverse as they come from different areas of knowledge (Zhou et al., 2018). Archibald & Archibald, 2016) considers that innovation is the process that turns new ideas into commercial or other value, in other words, a vital capacity in business, entrepreneurship, design, technology of all kinds, healthcare, and Engineering, construction, manufacturing, transport and telecommunications; Economics, sociology and management of the Organization. and argue (Gabison, 2019; Rangus et al., 2017) Open creativity refers to the explicit and implicit collaboration of another entity that produces knowledge and another organization that absorbs that knowledge or ideas, In other words, open creativity represents the agile flow of ideas from within and outside the organization, which is necessary for the organization to derive advantages from both external resource exploration and internal resource investment.

Second: Innovation in Green Products

1. The Concept of Innovation in Green Products

Innovation "is the process that turns new ideas into commercial or other value, in other words, it represents a vital capacity in business, entrepreneurship, design, technology of all kinds, health care, Engineering, construction, manufacturing, transport and telecommunications; Economics, sociology, and organization management (Archibald & Archibald, 2016). and argue (Gabison, 2019; Rangus et al., 2017) Open innovation refers to the explicit and implicit collaboration of another entity that produces knowledge and another organization that absorbs that knowledge or ideas, in other words, open innovation represents the agile flow of ideas from within and outside the organization needed to act to derive benefits from both external resource exploration and domestic" resource investment.

"Green is the first element of the green marketing mix (Fan & Zeng, 2011), often expressed in a variety of labels, (Mahmoud, 2018) Eco-friendly products refer to non-harmful products or services in the external environment." (Isshaswini & Datta, 2011).

Based on the above, innovation in green products represents all the actions, steps and mechanisms of FAO in its product design processes for environmental conservation.

2. Attributes of Innovation in Green Products

(Wahab, 2018) concluded that the attributes of green products can be reflected in the following:

- a) Does not contain toxic substances or ozone-depleting substances
- b) They can be recycled and/or produced from recycled materials
- c) Made of renewable materials
- d) Products with natural ingredients
- e) Contents of products under an approved chemical

3. Dimensions of Innovation in Green Product

Innovation in green products plays a key role in the promotion and growth of the organization through its focus on green orientation, so innovation in green products can be measured by the following:

1. **Green Design:** Green "Design is defined as a product designed using poison-free components and environmentally-friendly procedures recognized by international conservation organizations (Kumar & Ghodeswar, 2015); (Teng et al., 2012). (Mungai, 2009) noted that customers choose products and avoid others based on their impact on the natural environment, as customers reject products that are harmful to" environment.
2. **Green Processes:** "Green process innovation represents improved efficiency and efficiency of the production process and involves changes in the way products are produced and delivered to customers by modifying the manufacturing process and systems to produce products that meet environmental objectives (Zaawwi, 2022). (Ma, 2017) argued that green processes are of paramount importance in helping the organization to improve resource use and reduce pollution by addressing environmental problems in the manufacturing process and achieving a competitive advantage for the organization, as well as increasing the organization's revenues and revenues and thus increasing its market" share.

Part Three: Practical Side

First: "Test Reasonableness of Data"

The "results of Table 2 note that the data on the knowledge provider's attributes and innovation in green products follow the normal distribution because they have a higher intangible value than 0.05, showing the acceptance of the zero hypothesis and the rejection of the alternative hypothesis and its meaning in addition to the possibility of using the current study, the current study can use the teaching tests because the data as we have already been" distributed naturally.

Table 2: Natural Distribution Tests

Variable	Kol-Smi	P-value
KE	0.259	> 0.05
KD	0.207	> 0.05
KSPA	0.198	> 0.05
GD	0.269	> 0.05
GO	0.263	> 0.05
IIGP	0.215	> 0.05

The results in Table 3 show that the data follows the normal distribution, as the significance of the Kolmogorov-smirnov test is higher than (0.05) and is acceptable (Park, 2008). It can therefore be said that the results of these tests pave the way for the use of educational statistical tools for testing the validity of the hypotheses established and for verifying the reliability and stability of the measurement tools used in the study.

Second: Measuring Instrument Stability Test

This test is a statistical analysis of the level of reliability of data obtained by the investigator by distributing the survey to a sample of (131) researchers, as well as to reach a consistent result used in (Cronbach's Alpha). A method of testing stability, because the test itself provides stability conditions. In accuracy data, when its value is greater than (70%), the table (3) shows the coefficient of alpha-kronbach.

Table 3: Alpha Coefficients of Study Variables

	Dimensions	Paragraphs	Cronbach's Alpha	
knowledge service provider attributes	Knowledge Embeddedness	4	0.846	0.955
	Knowledge Distance	4	0.889	
innovation in green products	green design	4	0.915	0.952
	green operations	4	0.886	

The results in Table 3 show that the study measurement tools are relatively stable, with academic and administrative study particularly needing to measure the suitability of the measurement tools for developed phenomena, showing the consistency of the knowledge service provider attributes by 0.955 and innovation in green products by 0.952.

Third: Statistical Description of the Study Variables

This paragraph deals with the determination of the mathematical milieus, standard deviations and relative importance of each dimension used in the study.

❖ Knowledge Service Provider Attributes

The "results shown in Table 4 indicate that the highest mean was about KD and 4.14, with a standard deviation of (0.623), and with a relative interest of 83%, which means that the studied sample recognizes the importance of relying on distance knowledge to improve the reality of the company in question. The results also showed that after Knowledge Embeddedness (ke) came last with an arithmetic mean of (3.75) and with a standard deviation of (0.94), with a relative interest of" (75%).

The total value of the knowledge service provider's properties was determined. The results showed that the overall arithmetic mean was 3.94 with a standard deviation of 0.721, which means that the company recognizes the importance of investing in the knowledge provider's properties by 79% in order to ensure innovation in its products.

❖ Innovation in Green Products

Table 4 shows that the highest calculation mean was done after the go (4.27), with a peak standard deviation (0.707), and with a relative interest of (85%), which means that the studied sample recognizes the importance of guiding customers toward using green processes in their daily lives in order to preserve as much environment as possible. The results also showed that after the green design (GD) came last with an arithmetic mean (3.62) and with a standard deviation of (1.037), with a relative interest of (72%).

The total value of the innovation variable in green products showed that the overall arithmetic mean was 3.94 and a standard deviation of 0.828, which means that the company recognizes the importance of investing innovation in green products by 79% in order to ensure innovation in its products.

Table 4: Computational Media, Standard Deviations, and Relative Importance of Study Variables

NO.	mean	S.D	%	NO.	mean	S.D	%
K1	3.53	1.349	71%	GD1	3.53	1.146	71%
KE2	3.37	1.229	67%	GD2	3.79	1.263	76%
KE3	3.44	1.111	69%	GD3	3.51	1.126	70%
K4	4.67	0.827	93%	GD4	3.65	1.045	73%
KE	3.75	0.94	75%	GD	3.62	1.037	72%
KD1	4.34	0.856	87%	GO1	4.55	0.879	91%
KD2	4.02	0.638	80%	GO2	4.34	0.856	87%
KD3	4.18	1.16	84%	Go3	4.18	1.16	84%
KD4	4.01	1.034	80%	GO4	4.01	1.034	80%
KD	4.14	0.623	83%	GO	4.27	0.707	85%
KSPA	3.94	0.721	79%	IIGP	3.94	0.828	79%

Fourth: Test Hypotheses

1. **Correlation Hypotheses:** To test the correlation between the knowledge service provider attributes and innovation in green products, the researcher used the simple correlation coefficient (Pearson), as shown in Table 5:

Table 5: Correlation Matrix between Study Variables

	Knowledge Embeddedness	Knowledge Distance	knowledge service provider attributes	green design	green operations	innovation in green products
Knowledge Embeddedness	1	.692**	.950**	.838**	.709**	.828**
Knowledge Distance	.692**	1	.882**	.810**	.960**	.917**
knowledge service provider attributes	.950**	.882**	1	.896**	.876**	.936**
green design	.838**	.810**	.896**	1	.793**	.966**
green operations	.709**	.960**	.876**	.793**	1	.924**
innovation in green products	.828**	.917**	.936**	.966**	.924**	1

The relationship between the knowledge-provider attributes and innovation in green products has gained a correlation value of 0.936, showing the consistency of responses to the phenomenon in question, and the results show that there is a moral correlation between the knowledge attributes of the provider and the dimensions of innovation in green products by 0.896, 0.876, respectively, of the green design and the green process. Indicates that the concerned studied company is aware of the importance of a service provider's knowledge attributes to foster innovation in green products.

Based on the foregoing, the first claim, which provides for a meaningful correlation between the knowledge service provider attributes and innovation in green products, can be accepted.

2. **Impact Hypotheses:** To test the impact relationship between the knowledge service provider attributes and innovation in green products, the researcher used modeling the structural equation as follows:

The results show that the knowledge service provider attributes have an impact on innovation in green products, which means that the analytical indicators in Figure 2 and Table 6 show that the phenomenon in question recognizes the importance of the knowledge service provider attributes. This means that one improvement of standard deviation achieves innovation in green products by (0.936), by a standard error (0.036).

The knowledge service provider attributes explained the difference in innovation in green products, and the residual value is not within the limits of the study.

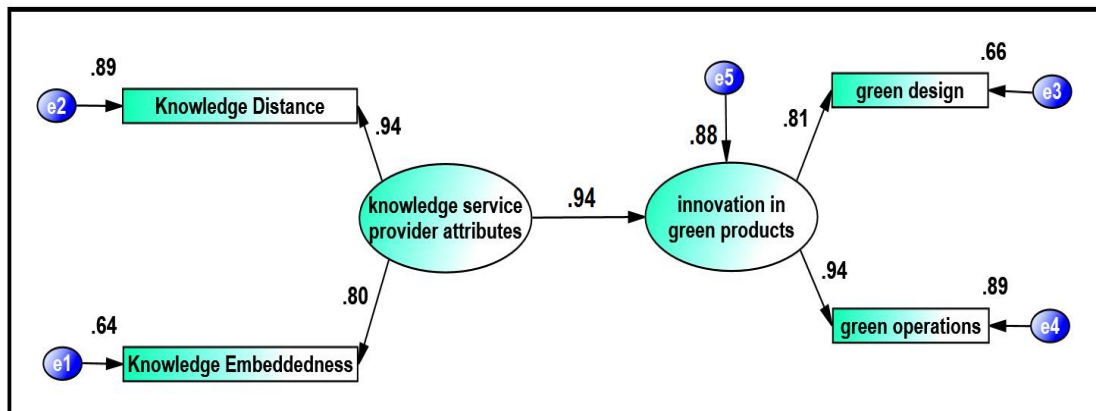


Figure 2: Structural Model of the Impact of a Provider's Knowledge Attributes on Innovation in Green Products

Table 6: Summary of Impact Analysis Results of the Provider's Knowledge Properties on Innovation in Green Products

Path			Estimates	S.R	C.V.	R ²	P
Knowledge service provider attributes	--->	Innovation in green products	0.936	0.036	26	0.875	0.001

Based on the above, the second hypothesis, which provides for a meaningful influence relationship to the knowledge service provider attributes in innovation in green products, can be accepted.

Part Four: Conclusions and Recommendations

First: Conclusions

1. The company under consideration is interested in investing highly conscious distribution channels in targeted areas, and in selling environmentally friendly products to distinguished agents whose objective is to distribute products without damaging the environment.
2. The results showed the company's interest in adopting specialized software to support its internal processes and make the best decisions that improve the organization's ability and reality in teamwork.
3. The company has sought to develop the skills of its employees by participating in the working groups and guiding the employees morale, intellect and skill.
4. The company seeks to satisfy its customers by ensuring that their requirements are met and met in the environment.
5. The company's interest in developing the capabilities of workers by encouraging them to participate in training courses so that they can participate in innovation in green products and develop the realities of the company.

Second: Recommendations

1. Improve consumers' motivation to care about the environment by throwing harmful substances in their designated areas to ensure recycling by their responsible companies.
2. The company under consideration should address product price increases as they may have an adverse impact on the environment and consumer purchasing intentions.
3. The need for a studied organization to build positive relationships with teams by developing its ability to actively encourage employees to build essential business activities that contribute to positive employee relationships.
4. The results showed that the company needs to interact with customers in order to ensure that they know all their requirements and respond to their changing needs, which requires improving their ability to adapt to the needs of customers.
5. The business is committed to working with market-specific distributors who are dependable and trustworthy as well as targeted customers.

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