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RESEARCH PAPER

A Systematic Elicitation of the Product Service System (PSS) Based On the Service Quality Metrics SERVQUAL and Implementation of Knowledge Management System

A Arul Oli[1*] & C Dhanasekaran[2]

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ABSTRACT

Product Service System (PSS) is a developing field of examination in industry practices in todays' global economy, which significantly affect both production and utilization of resources. In order to enable the applicability of a product service system in an industry, it is important to assess the system by using a metrics known as the SERVQUAL model, which characterizes the quality as difference between the customer's expectation and perception with regard to the service delivered to them. It is a multi-dimensional research tool designed to measure quality by capturing the expectancy-confirmation paradigm which suggests the consumers perceived quality of how well a given delivery meets their expectations of that delivery. In this study, two subscales (tangibility and reliability) from SERVQUAL metric were extracted and utilized to find the quality level. The present study developed an integrative theoretical model of Knowledge Management System (KMS). Empirical examination of the hypothesized relationships among variables is conducted by means of questionnaire surveys and the collected data collected from the survey were assessed. The findings of the study revealed that KMS approach served as a facilitated tool for sharing and utilizing knowledge in different organizations.

KEYWORDS: *Product service system; Tangibility; Reliability; Knowledge management system; Customer's expectation; Customer's perception.*

1. Introduction

With the rising difficulties from market competitors and environment regulations, manufacturers are putting more accentuation on adding value to customers through provisions of services. The services can provide value without compromising the customer's need. The Product Service System (PSS) is an emerging manufacturing paradigm giving integrated product and service that deliver value in use and it comprises a basis of competitive strategy. Embracing PSS implies that manufacturers have transited from the concept of "product foremost and service the second" to "service-based product". One generally accepted definition of PSS is an "integrated bundle of products and services which aims at creating customer utility and generating value" [6]. PSS assessments must be performed to get data with significant knowledge about customer's need, expectation and priorities [21]. This will help organization with achieving customizations in service and products, whenever required, or plan for investment in a new product or services to meet the expectations of the customer. On the other hand, estimating and surveying PSS is primary issue as the behaviour of customer towards products and services are changing and making it harder for the service providers to assess and manage services effectively and efficiently [5]. Generally, it was grouped into three as product-oriented, use-oriented and result-oriented PSS [18, 19, 20]. In product-oriented PSS, the product proprietorship was held by the customer, however extra services like maintenance and warranty given by the manufacturer to ensure the performance of product over a given period. In use oriented PSS, the service provider may or

* Corresponding author: *A. Arul Oli*
dean.cpd@velsuniv.ac.in

1. *Department of Mechanical Engineering, Vels Institute of Science, Technology and Advanced Studies (VISTAS) Chennai, India.*
2. *Department of Mechanical Engineering, Vels Institute of Science, Technology and Advanced Studies (VISTAS) Chennai, India.*

may not have been the original manufacturer, holds the product proprietorship and customer buys the utilization of the product and its function throughout a given timeframe. The result-oriented PSS focused on the service that replaces the product rather than the use-oriented PSS. As the transition to digitization progresses, rapid advances in Information Technology (IT) enables an organization to move toward the real-time data of the product over the entire Product Life Cycle (PLC); thus decrease the difficulty of product lifecycle management (PLM). SERVQUAL scale was most utilized for the measure of quality [21, 22, 23]. This evaluation instrument is SERVQUAL which is developed for tracking the quality of service and determine the critical significance of consumer perceptions and expectations. It has five major dimensions to measure the service quality such as tangibles, reliability, responsiveness, assurance, and empathy [25]. Knowledge generated in various PLC phases are vital for the entire PLC. The beginning-of-life (BOL) engineering knowledge cannot exclusively be applied by manufacturing organizations to various customer applications, but also help to improve their MOL services like repair and maintenance. The middle-of-life (MOL) data is imperative source of information for designers in BOL phase, particularly the knowledge about failure of components, maintenance, and reliability. For example, the service experience from past similar products is vital for both current product improvement and future products developments as product flaws can be systematically rectified and this is particularly true in PSS scenario [10]. The MOL knowledge will also be valuable for the MOL phase itself as it can improve the quality of the provided service and consistency of service. In the environmental perspectives, the end-of-life (EOL) knowledge will help the Reduce and Redesign in the next lifecycle [11].

Knowledge management was defined as "explicit strategies, tools and practices applied by the management that seek to make knowledge a resource for the organization". Generally, knowledge management aims to capture and save the past experience data and reuse them to solve the new problems, including both improvement of existing product and development of new product [10]. Knowledge range required in PSS design is broader, because not only the products are considered in the design phase but also the service is considered as a vital component [8]. In PSS scenario, the intensive utilization of knowledge form various disciplines makes knowledge management even more crucial and challenging than ever [9]. As a business strategy, the PLM concerns various product stakeholders over the entire PLC. As a technology solution, PLM permits creation, transformation and sharing of knowledge along the entire PLC with the aid of using various tools and technologies. The mix of the above two perspective leads to treat PLM as a knowledge management system to support various PLC phases. The knowledge requirement and knowledge management practice in every aspect may be different. In order to better manage knowledge in such case, the focus on knowledge management in each phase must be different as well.

[12] introduced an integrated knowledge framework based on the central class "lifestyle system" to support the PSS design. [13] presented a lifecycle management approach based on knowledge for PSS with the consideration of an ontological representation. They introduced three knowledge-based life cycle method to make engineering processes adaptive to give the involved actors with proper PSS knowledge and to support the stakeholders in their decision-making process. [14] proposed a strategy to help ideation and preliminary design of sustainable PSS within industrial chains based on the Quality Functional Deployment (QFD) approach. It permits defining asset of robust prerequisites for making a new PSS with respect to customer needs and sustainability principles. [15] introduced a coordinated methodology to support the PSS design process into a Virtual Enterprise (VE), which contains various phases from idea management to global network definition. [16] introduced a framework for managing and using PSS design knowledge to support designers in idea generation of integrated combinations of products and services in PSS. The framework had worked fully intent on supporting two design operations among the three PSS design models. [17] studied the principal drivers and barriers that affects the adoption of use-oriented PSS by consumers in the medium and small cities using quantitative approach and found that "environmental concern" and "healthy lifestyle" are the prime drivers affecting the adoption of use-oriented PSS by consumers. [21] examined the knowledge management practice in PSS and recommended that more proper knowledge representation manner and standard knowledge representation form, identification and classification of most significant knowledge for various stakeholders and balanced application of personalization and codification system will be

vital for organization in PSS domain to manage the knowledge.

After the careful reviewing of the various existing research performed so far utilizing the SERVQUAL model, it was found that much research was carried out in SERVQUAL model, however limited research was conducted using the SERVQUAL model to evaluate the Product Service System (PSS). Therefore, using the SERVQUAL model would be a contribution to existing research on Product Service System (PSS) and knowledge management system will help in Product Service System (PSS). This is research gap and to fill this gap, it was proposed to examine the product service system (PSS) based on the service quality metrics SERVQUAL.

2. Theoretical Framework

This study aims to find the service quality level using the SERVQUAL metric from the Manufacturing Company, Automotive industry and Supply Chain Management Company. The hypothesis therefore posits the elements like Tangibility, Reliability, Responsiveness, Assurance and Empathy of customer expectations and perceptions that influences the service quality. The set of hypotheses included in the study are as follows.

H1- The adoption of KMS approach, significantly enhances the employee's knowledge on tangibility, influencing the customers' quality expectation

H2- The adoption of KMS approach, significantly enhances the employee's knowledge on tangibility, influencing the customers' quality perception

H3- The adoption of KMS approach, significantly enhances the employee's knowledge on reliability, influencing the customers' quality expectation

H4 – The adoption of KMS approach, significantly enhances the employee's knowledge on reliability, influencing the customers' quality perception

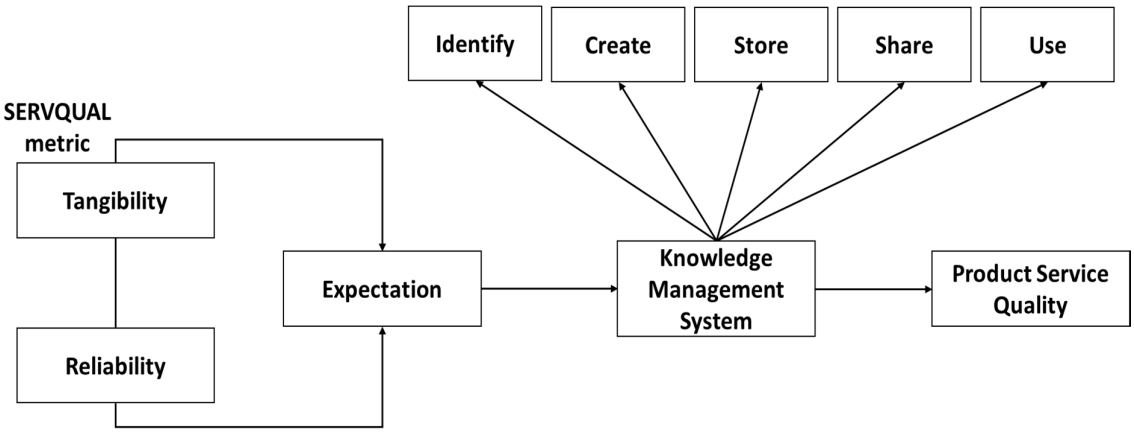

Fig. 1. conceptual framework

3. Research Methodology

3.1. Research design and data collection

The study used a descriptive survey research approach to assess the PSS in an industrial sector using a SERVQUAL metric. Service quality was assessed based on two subscales namely tangibility and reliability. After analysing the results of the two dimensions, a KMS approach was prepared. This KMS approach was employed to improve the worker's knowledge on the service quality. The study used the KMS related questions to measure how the organization is positioned with regard to the basic knowledge processes that are part of the KMS framework i.e., identify, create, store, share and use of knowledge [26].

3.2. Research instrument: questionnaire

To acquire primary data, the questionnaire was distributed to the respondents. The survey method was frequently used to see if the independent variables and the dependent variables are closely connected.

3.3. Study implementation

3.3.1. Assessment before the KMS implementation

The questionnaire is prepared to find out the KMS awareness level of employees in the selected companies. The questionnaire was divided into subgroups as follows: identify, create, store, share and use of knowledge.

3.3.2. Educational intervention programme on KMS

Education intervention programme on KMS was conducted to select according to the plan of work at a convenient time for the workers. The programme was organised with the help of materials prepared by the investigator. The programme includes lectures by experts with videos.

3.3.3. Assessment after the intervention programme

Post assessment for educational intervention programme was done to know the effectiveness of the intervention programme organised on KMS, the same questionnaire with KMS related questions were again provided to the workers after the intervention programme and collected. Responses are gathered and the data processing was done.

3.4. Sample size

A total of 600 samples were selected for the present study (200 samples from each industry namely Manufacturing Company, Automotive Industry and Supply Chain Management Company).

3.5. Target population

A questionnaire was framed, and interviews were conducted to collect the primary data. The questionnaire was issued, and responses were collected from 600 people. For KMS approach, among the total respondents, workers of Manufacturing Company accounted for 200 respondents, workers of Automotive Industry accounted for 200 respondents, and workers of Supply Chain Management Company accounted for 200 respondents. In total, there are 600 workers took part in the survey related to KMS approach.

3.6. Sampling techniques

The stratified random sample approach was used to collect data for this investigation. The chosen component of the aggregate or totality from which the aggregate or totality is appraised or assumed can be included in sampling.

3.7. Data collection procedures

To ensure that the analysis is valid and trustworthy, the study uses both primary and secondary data. To collect primary data, the researcher designed a questionnaire and have conducted interview with the respondents. Whereas, for the secondary data, review of published literature and other related sources were used. The information was gathered from Medline/PubMed, the Centre for Reviews and Dissemination, the Cochrane Library, Ingenta, and OVID, among other places.

3.8. Statistical method

For quantitative data processing, the present study used the Standard Statistical Package for Social Sciences (SPSS) version 20. Data analysis was carried out after data gathering and compilation. The results were interpreted with the help of different analytical methods.

4. Results and Discussions

H1- The adoption of KMS approach, significantly enhances the employee's knowledge on tangibility, influencing the customers' quality expectation

Expectations of service quality are greatly influenced by the observable features of a service. These make up the elements of a service's exterior design that affect external client pleasure. Price, ranking in relation to competitors, marketing communication and actualization, and word-of-mouth impacts are the essential components of tangibility [27], which raises customers' expectations for the quality of their services [28].

Tab. 1. Employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	t	df	Sig. (2-tailed)	Test Value = 0 Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The company will have modern looking equipment.	19.721	199	.153	2.850	2.56	3.14
The physical facilities at the company will be visually appealing.	19.702	199	.161	2.810	2.53	3.09

Employees will be neat appearing.	21.059	199	.149	2.970	2.69	3.25
Materials associated with the service (such as pamphlets or statements) will be visually appealing.	24.053	199	.102	3.250	2.98	3.52

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation in automotive industry. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers' quality expectation in automotive industry.

Tab. 2. Employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	86.112	199	.000	4.280	4.18	4.38
Knowledge workers know from each other who knows what information about tangible elements.	48.409	199	.000	3.795	3.64	3.95
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	73.468	199	.000	3.890	3.79	3.99
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	55.091	199	.000	3.775	3.64	3.91
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	50.418	199	.000	3.440	3.31	3.57
Knowledge workers develop networks to create knowledge on tangible products.	47.286	199	.000	3.720	3.56	3.88
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	52.128	199	.000	3.960	3.81	4.11
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	115.105	199	.000	4.575	4.50	4.65

Knowledge workers usually understand and retell what they learned about tangible products in their own way.	83.756	199	.000	4.705	4.59	4.82
Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	121.156	199	.000	4.660	4.58	4.74
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	38.602	199	.000	3.165	3.00	3.33
Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	52.138	199	.000	3.980	3.83	4.13
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	112.356	199	.000	4.355	4.28	4.43
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	69.711	199	.000	3.965	3.85	4.08
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	92.993	199	.000	4.465	4.37	4.56

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation in automotive industry. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality expectation in automotive industry, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in automotive industry.

Tab. 3. Employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The company will have modern looking equipment.	21.129	199	.114	3.060	2.77	3.35
The physical facilities at the company will be visually appealing.	20.422	199	.132	2.830	2.56	3.10
Employees will be neat appearing.	20.760	199	.127	3.070	2.78	3.36

Materials associated with the service (such as pamphlets or statements) will be visually appealing.	22.077	199	.088	3.170	2.89	3.45

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation in manufacturing company. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers' quality expectation in manufacturing company.

Tab. 4. Employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	85.165	199	.000	4.285	4.19	4.38
Knowledge workers know from each other who knows what information about tangible elements.	49.373	199	.000	3.825	3.67	3.98
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	74.552	199	.000	3.905	3.80	4.01
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	55.091	199	.000	3.775	3.64	3.91
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	50.324	199	.000	3.455	3.32	3.59
Knowledge workers develop networks to create knowledge on tangible products.	46.721	199	.000	3.720	3.56	3.88
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	50.920	199	.000	3.950	3.80	4.10
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	117.258	199	.000	4.580	4.50	4.66
Knowledge workers usually understand and retell what they learned about tangible products in their own way.	89.120	199	.000	4.725	4.62	4.83

Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	124.255	199	.000	4.670	4.60	4.74
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	38.787	199	.000	3.180	3.02	3.34
Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	53.454	199	.000	4.010	3.86	4.16
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	114.134	199	.000	4.360	4.28	4.44
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	69.711	199	.000	3.965	3.85	4.08
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	96.421	199	.000	4.480	4.39	4.57

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation in manufacturing company. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality expectation in manufacturing company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in manufacturing company.

Tab. 5. Employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The company will have modern looking equipment.	52.127	199	.081	4.150	3.99	4.31
The physical facilities at the company will be visually appealing.	36.927	199	.096	3.810	3.61	4.01
Employees will be neat appearing.	58.611	199	.068	3.930	3.80	4.06
Materials associated with the service (such as pamphlets or statements) will be visually appealing.	36.337	199	.102	3.660	3.46	3.86

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality expectation in supply chain management company. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers'

quality expectation in supply chain management company.

Tab. 6. Employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	90.088	199	.000	4.320	4.23	4.41
Knowledge workers know from each other who knows what information about tangible elements.	50.278	199	.000	3.835	3.68	3.99
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	76.294	199	.000	3.900	3.80	4.00
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	57.116	199	.000	3.780	3.65	3.91
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	51.473	199	.000	3.480	3.35	3.61
Knowledge workers develop networks to create knowledge on tangible products.	48.090	199	.000	3.765	3.61	3.92
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	50.814	199	.000	3.940	3.79	4.09
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	117.545	199	.000	4.585	4.51	4.66
Knowledge workers usually understand and retell what they learned about tangible products in their own way.	95.290	199	.000	4.740	4.64	4.84
Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	124.771	199	.000	4.675	4.60	4.75
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	40.585	199	.000	3.215	3.06	3.37
Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	56.986	199	.000	4.070	3.93	4.21
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	110.396	199	.000	4.360	4.28	4.44
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	70.203	199	.000	3.980	3.87	4.09

Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	100.065	199	.000	4.485	4.40	4.57

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality expectation in supply chain management company. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality expectation in supply chain management company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in supply chain management company.

H2- The adoption of KMS approach, significantly enhances the employee's knowledge on tangibility, influencing the customers' quality perception

One of the hallmarks of a service is tangibility. It speaks of goods that are reachable physically. Additionally, a lot of scholars described tangibles as a physical facility like materials, equipment, and so forth. Because occasionally a customer will value a product based on its appearance or physical characteristics. Therefore, the physical forms or appearance of the products must demonstrate their ability to offer a high level of service. Additionally, according to experts, tangibles are just as important as empathy [29].

Tab. 7. Employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
company has modern looking equipment.	35.265	199	.138	3.450	3.26	3.64
company's physical facilities are visually appealing.	33.368	199	.245	3.730	3.51	3.95
company's reception desk employees are neat appearing.	36.849	199	.126	3.970	3.76	4.18
Materials associated with the service (such as pamphlets or statements) are visually appealing.	79.749	199	.095	4.570	4.46	4.68

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality perception in automotive industry. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers' quality perception in automotive industry.

Tab. 8. Employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	62.640	199	.000	4.020	3.89	4.15
Knowledge workers know from each other who knows what information about tangible elements.	47.247	199	.000	3.480	3.33	3.63
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	75.239	199	.000	4.145	4.04	4.25
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	67.637	199	.000	4.155	4.03	4.28
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	65.537	199	.000	4.075	3.95	4.20
Knowledge workers develop networks to create knowledge on tangible products.	62.591	199	.000	3.845	3.72	3.97
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	52.991	199	.000	3.460	3.33	3.59
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	40.306	199	.000	2.385	2.27	2.50
Knowledge workers usually understand and retell what they learned about tangible products in their own way.	30.373	199	.000	2.085	1.95	2.22
Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	29.289	199	.000	2.080	1.94	2.22
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	30.577	199	.000	2.010	1.88	2.14

Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	34.077	199	.000	2.420	2.28	2.56
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	32.729	199	.000	2.675	2.51	2.84
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	33.466	199	.000	2.725	2.56	2.89
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	35.414	199	.000	2.975	2.81	3.14

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality perception in automotive industry. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality perception in automotive industry, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in automotive industry.

Tab. 9. Employee's knowledge on tangibility before the implementation of KMS approach influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
company has modern looking equipment.	21.725	199	.165	3.040	2.76	3.32
company's physical facilities are visually appealing.	20.027	199	.264	2.870	2.59	3.15
company's reception desk employees are neat appearing.	23.965	199	.119	3.290	3.02	3.56
Materials associated with the service (such as pamphlets or statements) are visually appealing.	21.107	199	.134	3.000	2.72	3.28

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality perception in manufacturing company. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers' quality perception in manufacturing company.

Tab. 10. Employee's knowledge on tangibility after the implementation of KMS approach influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	60.399	199	.000	4.005	3.87	4.14
Knowledge workers know from each other who knows what information about tangible elements.	47.093	199	.000	3.485	3.34	3.63
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	73.679	199	.000	4.135	4.02	4.25
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	67.121	199	.000	4.160	4.04	4.28
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	65.766	199	.000	4.085	3.96	4.21
Knowledge workers develop networks to create knowledge on tangible products.	62.178	199	.000	3.845	3.72	3.97
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	54.155	199	.000	3.475	3.35	3.60
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	40.306	199	.000	2.385	2.27	2.50
Knowledge workers usually understand and retell what they learned about tangible products in their own way.	29.936	199	.000	2.105	1.97	2.24
Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	28.910	199	.000	2.100	1.96	2.24
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	29.870	199	.000	2.030	1.90	2.16
Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	34.147	199	.000	2.395	2.26	2.53
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	32.865	199	.000	2.645	2.49	2.80
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	33.713	199	.000	2.710	2.55	2.87
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	35.541	199	.000	2.975	2.81	3.14

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality perception in manufacturing company. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality

perception in manufacturing company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in manufacturing company.

Tab. 11. Employee's knowledge on tangibility before the implementation of KMS approach influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
company has modern looking equipment.	34.867	199	.097	3.320	3.13	3.51
company's physical facilities are visually appealing.	26.913	199	.176	3.400	3.15	3.65
company's reception desk employees are neat appearing.	29.930	199	.164	3.830	3.58	4.08
Materials associated with the service (such as pamphlets or statements) are visually appealing.	92.857	199	.054	4.590	4.49	4.69

The table above shows the One-Sample t-test for employee's knowledge on tangibility before the implementation of KMS approach in influencing the customers' quality perception in supply chain management company. Where the results infer that the employee's knowledge on tangibility before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility before the implementation of KMS approach does not have any influence on customers' quality perception in supply chain management company.

Tab. 12. Employee's knowledge on tangibility after the implementation of KMS approach influencing the customers' quality perception

	One-Sample Test					
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the available information about tangible elements of the services in the company.	62.697	199	.000	4.000	3.87	4.13
Knowledge workers know from each other who knows what information about tangible elements.	49.271	199	.000	3.510	3.37	3.65
Knowledge workers look for existing information on tangible elements in order to avoid repeating the previous efforts.	73.032	199	.000	4.115	4.00	4.23
Knowledge workers adopt explicit strategies for knowledge development on the techniques that are essentially meant for tangible products.	65.994	199	.000	4.120	4.00	4.24
Knowledge workers use clear techniques for acquiring new knowledge on tangible products.	63.579	199	.000	4.050	3.92	4.18
Knowledge workers develop networks to create knowledge on tangible products.	59.372	199	.000	3.785	3.66	3.91
In our organisation, there is a clear strategy for storing knowledge on tangible products for future usage.	51.661	199	.000	3.450	3.32	3.58
Knowledge workers sure about what kind of knowledge should be stored with respect to tangible products.	41.281	199	.000	2.360	2.25	2.47

Knowledge workers usually understand and retell what they learned about tangible products in their own way.	29.903	199	.000	2.145	2.00	2.29
Knowledge workers spend enough time to share ideas and experiences with each other about visually appealing materials associated with the service.	29.603	199	.000	2.090	1.95	2.23
Knowledge workers consciously develops knowledge sharing habit with respect to tangible products.	30.360	199	.000	2.070	1.94	2.20
Knowledge workers are encouraged to share their ideas about tangible products with other colleagues.	32.669	199	.000	2.460	2.31	2.61
Knowledge workers apply available knowledge on the services of tangible elements to improve their jobs.	32.363	199	.000	2.660	2.50	2.82
Knowledge workers apply available knowledge to innovate new solutions on the services of tangible elements.	34.479	199	.000	2.765	2.61	2.92
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to tangible products.	35.509	199	.000	3.010	2.84	3.18

The table above shows the One-Sample t-test for employee's knowledge on tangibility after the implementation of KMS approach in influencing the customers' quality perception in supply chain management company. Where the results infer that the employee's knowledge on tangibility after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on tangibility after the implementation of KMS approach have a significant influence on customers' quality perception in supply chain management company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on tangibility after the implementation of KMS approach in supply chain management company.

H3- The adoption of KMS approach, significantly enhances the employee's knowledge on reliability, influencing the customers' quality expectation

The ability to deliver the promised service consistently and precisely is known as reliability. This reduction suggests that the company area upholds its promises regarding delivery, service arrangement, problem resolution, and value. Customers should cooperate with business units or corporations that honour their commitments, particularly those related to their premises about administrative outcomes and centre support characteristics. Any firm will be able to tell that customers prefer and desire the unwavering quality [32; 33; 34, 30].

Tab.13. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When company promise to do something by a certain time, they do.	20.644	199	.173	2.970	2.68	3.26
When a customer has a problem, company will show a sincere interest in solving it.	20.296	199	.186	3.070	2.77	3.37
The company will perform the service right the first time.	20.779	199	.169	2.990	2.70	3.28
The company will provide the service at the time they promise to do so.	21.713	199	.153	2.950	2.68	3.22
The company will insist on error free records	24.880	199	.115	3.390	3.12	3.66

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation in automotive industry. Where the results infer that the employee's knowledge on reliability before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality expectation in automotive industry.

Tab. 14. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation

	One-Sample Test					
	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	33.045	199	.000	2.825	2.66	2.99
Knowledge workers gets help from others in identifying the problem.	32.141	199	.000	2.190	2.06	2.32
Knowledge workers look for error free records in order to ensure good service.	50.581	199	.000	3.695	3.55	3.84
Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	65.454	199	.000	3.960	3.84	4.08
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	57.954	199	.000	3.930	3.80	4.06
Knowledge workers develop interest in providing the service on time.	77.246	199	.000	3.930	3.83	4.03
In our organisation, there is a clear strategy for storing knowledge on product services.	83.005	199	.000	4.110	4.01	4.21
Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	31.622	199	.000	2.430	2.28	2.58
Knowledge workers usually understand and retell what they learned about product services in their own way.	37.749	199	.000	3.200	3.03	3.37
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	42.245	199	.000	3.465	3.30	3.63
Knowledge workers consciously develops knowledge sharing habit with respect to product services.	40.060	199	.000	3.410	3.24	3.58
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	41.687	199	.000	3.375	3.22	3.53
Knowledge workers apply available knowledge on the services to satisfy the customers.	94.304	199	.000	4.320	4.23	4.41
Knowledge workers apply available knowledge in solving the customer's problems.	47.359	199	.000	3.775	3.62	3.93

Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	73.088	199	.000	3.875	3.77	3.98

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation automotive industry. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality expectation in automotive industry, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in automotive industry.

Tab. 15. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When company promise to do something by a certain time, they do.	19.990	199	.146	3.020	2.72	3.32
When a customer has a problem, company will show a sincere interest in solving it.	19.853	199	.168	2.890	2.60	3.18
The company will perform the service right the first time.	20.424	199	.107	2.810	2.54	3.08
The company will provide the service at the time they promise to do so.	18.594	199	.276	2.770	2.47	3.07
The company will insist on error free records	18.860	199	.248	2.690	2.41	2.97

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation in manufacturing company. Where the results infer that the employee's knowledge on reliability before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality expectation in manufacturing company.

Tab. 16. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	33.159	199	.000	2.825	2.66	2.99
Knowledge workers gets help from others in identifying the problem.	32.248	199	.000	2.170	2.04	2.30
Knowledge workers look for error free records in order to ensure good service.	49.770	199	.000	3.690	3.54	3.84

Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	64.727	199	.000	3.955	3.83	4.08
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	57.954	199	.000	3.930	3.80	4.06
Knowledge workers develop interest in providing the service on time.	78.442	199	.000	3.935	3.84	4.03
In our organisation, there is a clear strategy for storing knowledge on product services.	80.869	199	.000	4.085	3.99	4.18
Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	32.183	199	.000	2.455	2.30	2.61
Knowledge workers usually understand and retell what they learned about product services in their own way.	36.044	199	.000	3.085	2.92	3.25
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	39.693	199	.000	3.350	3.18	3.52
Knowledge workers consciously develops knowledge sharing habit with respect to product services.	38.105	199	.000	3.295	3.12	3.47
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	38.947	199	.000	3.255	3.09	3.42
Knowledge workers apply available knowledge on the services to satisfy the customers.	85.249	199	.000	4.28000	4.1810	4.3790
Knowledge workers apply available knowledge in solving the customer's problems.	45.675	199	.000	3.75500	3.5929	3.9171
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	69.114	199	.000	3.85000	3.7402	3.9598

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation manufacturing company. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality expectation in manufacturing company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in manufacturing company.

Tab. 17. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When company promise to do something by a certain time, they do.	26.913	199	.193	3.400	3.15	3.65
When a customer has a problem, company will show a sincere interest in solving it.	29.930	199	.108	3.830	3.58	4.08

The company will perform the service right the first time.	26.180	199	.227	3.000	2.77	3.23
The company will provide the service at the time they promise to do so.	39.261	199	.083	3.910	3.71	4.11
The company will insist on error free records	28.532	199	.114	3.450	3.21	3.69

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality expectation in supply chain management company. Where the results infer that the employee's knowledge on reliability before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality expectation in supply chain management company.

Tab. 18. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	33.674	199	.000	2.880	2.71	3.05
Knowledge workers gets help from others in identifying the problem.	32.036	199	.000	2.265	2.13	2.40
Knowledge workers look for error free records in order to ensure good service.	51.919	199	.000	3.730	3.59	3.87
Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	64.662	199	.000	3.930	3.81	4.05
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	56.539	199	.000	3.940	3.80	4.08
Knowledge workers develop interest in providing the service on time.	81.877	199	.000	3.945	3.85	4.04
In our organisation, there is a clear strategy for storing knowledge on product services.	84.365	199	.000	4.100	4.00	4.20
Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	32.601	199	.000	2.550	2.40	2.70
Knowledge workers usually understand and retell what they learned about product services in their own way.	36.555	199	.000	3.090	2.92	3.26
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	40.230	199	.000	3.325	3.16	3.49

Knowledge workers consciously develops knowledge sharing habit with respect to product services.	37.916	199	.000	3.305	3.13	3.48
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	39.063	199	.000	3.250	3.09	3.41
Knowledge workers apply available knowledge on the services to satisfy the customers.	43.719	199	.000	3.320	3.17	3.47
Knowledge workers apply available knowledge in solving the customer's problems.	38.088	199	.000	3.330	3.16	3.50
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	42.428	199	.000	3.365	3.21	3.52

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality expectation supply chain management company. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality expectation in supply chain management company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in supply chain management company.

H4- The adoption of KMS approach, significantly enhances the employee's knowledge on reliability, influencing the customers' quality perception

Being dependable to the customer is what reliability is all about. Customers should pay close attention to reliability issues because they measure how much a component's impact affects the system reliability. Taking the consumer at an organization framework is a fundamental way to illustrate this concept. An organization framework's dependability is most strongly influenced by its weakest component [35].

Tab. 19. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When the company promises to do something by a certain time, it does so.	21.211	199	.128	2.890	2.62	3.16
When you have a problem, the company shows a sincere interest in solving it.	23.985	199	.164	3.150	2.89	3.41
The company performs the service right the first time.	20.393	199	.102	2.660	2.40	2.92
The company provides its service at the time it promises to do so.	21.513	199	.147	2.980	2.71	3.25
The company insists on error free record	22.197	199	.156	3.280	2.99	3.57

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception in automotive industry. Where the results infer that the employee's knowledge on reliability before the

implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality perception in automotive industry.

Tab. 20. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	51.495	199	.000	3.46000	3.3275	3.5925
Knowledge workers gets help from others in identifying the problem.	54.067	199	.000	3.81500	3.6759	3.9541
Knowledge workers look for error free records in order to ensure good service.	61.072	199	.000	4.02500	3.8950	4.1550
Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	107.994	199	.000	4.52500	4.4424	4.6076
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	71.045	199	.000	4.61000	4.4820	4.7380
Knowledge workers develop interest in providing the service on time.	111.875	199	.000	4.61000	4.5287	4.6913
In our organisation, there is a clear strategy for storing knowledge on product services.	38.933	199	.000	3.18000	3.0189	3.3411
Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	52.668	199	.000	3.99500	3.8454	4.1446
Knowledge workers usually understand and retell what they learned about product services in their own way.	107.002	199	.000	4.36000	4.2796	4.4404
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	72.044	199	.000	4.02000	3.9100	4.1300
Knowledge workers consciously develops knowledge sharing habit with respect to product services.	84.569	199	.000	4.42000	4.3169	4.5231
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	33.682	199	.000	3.22500	3.0362	3.4138
Knowledge workers apply available knowledge on the services to satisfy the customers.	62.616	199	.000	4.04000	3.9128	4.1672

Knowledge workers apply available knowledge in solving the customer's problems.	48.446	199	.000	3.48500	3.3431	3.6269
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	72.754	199	.000	4.15000	4.0375	4.2625

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception automotive industry. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality perception in automotive industry, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in automotive industry.

Tab. 21. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When the company promises to do something by a certain time, it does so.	20.323	199	.251	2.790	2.52	3.06
When you have a problem, the company shows a sincere interest in solving it.	18.906	199	.314	2.640	2.36	2.92
The company performs the service right the first time.	22.478	199	.195	3.190	2.91	3.47
The company provides its service at the time it promises to do so.	19.147	199	.295	2.820	2.53	3.11
The company insists on error free record	22.490	199	.183	3.160	2.88	3.44

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception in manufacturing company. Where the results infer that the employee's knowledge on reliability before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality perception in manufacturing company.

Tab. 22. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	52.618	199	.000	4.000	3.85	4.15
Knowledge workers gets help from others in identifying the problem.	106.730	199	.000	4.375	4.29	4.46

Knowledge workers look for error free records in order to ensure good service.	71.857	199	.000	4.025	3.91	4.14
Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	84.604	199	.000	4.425	4.32	4.53
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	33.436	199	.000	3.175	2.99	3.36
Knowledge workers develop interest in providing the service on time.	72.297	199	.000	4.100	3.99	4.21
In our organisation, there is a clear strategy for storing knowledge on product services.	49.742	199	.000	3.525	3.39	3.66
Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	79.174	199	.000	4.200	4.10	4.30
Knowledge workers usually understand and retell what they learned about product services in their own way.	68.637	199	.000	4.150	4.03	4.27
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	66.081	199	.000	4.050	3.93	4.17
Knowledge workers consciously develops knowledge sharing habit with respect to product services.	60.540	199	.000	3.825	3.70	3.95
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	47.552	199	.000	3.450	3.31	3.59
Knowledge workers apply available knowledge on the services to satisfy the customers.	41.453	199	.000	2.275	2.17	2.38
Knowledge workers apply available knowledge in solving the customer's problems.	31.462	199	.000	2.025	1.90	2.15
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	31.661	199	.000	1.975	1.85	2.10

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception manufacturing company. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality perception in manufacturing company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in manufacturing company.

Tab. 23. Employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
When the company promises to do something by a certain time, it does so.	35.991	199	.128	3.830	3.62	4.04
When you have a problem, the company shows a sincere interest in solving it.	25.814	199	.195	3.320	3.06	3.58
The company performs the service right the first time.	26.719	199	.186	3.650	3.38	3.92
The company provides its service at the time it promises to do so.	37.171	199	.104	3.870	3.66	4.08
The company insists on error free record	30.035	199	.143	3.420	3.19	3.65

The table above shows the One-Sample t-test for employee's knowledge on reliability before the implementation of KMS approach in influencing the customers' quality perception in supply chain management company. Where the results infer that the employee's knowledge on reliability before the implementation of KMS approach showed a two-tailed p-value greater than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability before the implementation of KMS approach does not have any influence on customers' quality perception in supply chain management company.

Tab. 24. Employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge workers identify the problem and shows a sincere interest in solving it.	35.942	199	.000	3.230	3.05	3.41
Knowledge workers gets help from others in identifying the problem.	37.064	199	.000	3.775	3.57	3.98
Knowledge workers look for error free records in order to ensure good service.	127.069	199	.000	4.780	4.71	4.85
Knowledge workers adopt explicit strategies to complete the work within the stipulated time.	305.982	199	.000	4.945	4.91	4.98
Knowledge workers use clear techniques for solving the customer problems in a quicker way.	110.255	199	.000	4.610	4.53	4.69
Knowledge workers develop interest in providing the service on time.	35.835	199	.000	2.830	2.67	2.99
In our organisation, there is a clear strategy for storing knowledge on product services.	51.999	199	.000	3.780	3.64	3.92

Knowledge workers sure about what kind of knowledge should be stored with respect to product services.	135.060	199	.000	4.275	4.21	4.34
Knowledge workers usually understand and retell what they learned about product services in their own way.	54.594	199	.000	3.660	3.53	3.79
Knowledge workers spend enough time to share ideas and experiences with each other about maintaining the error free records.	133.792	199	.000	4.615	4.55	4.68
Knowledge workers consciously develops knowledge sharing habit with respect to product services.	38.147	199	.000	3.505	3.32	3.69
Knowledge workers are encouraged to share their ideas about product services with other colleagues.	88.342	199	.000	4.115	4.02	4.21
Knowledge workers apply available knowledge on the services to satisfy the customers.	38.750	199	.000	3.270	3.10	3.44
Knowledge workers apply available knowledge in solving the customer's problems.	102.831	199	.000	4.110	4.03	4.19
Knowledge workers can make appropriate learning goals (short/long-term goals) with respect to product services.	57.423	199	.000	4.160	4.02	4.30

The table above shows the One-Sample t-test for employee's knowledge on reliability after the implementation of KMS approach in influencing the customers' quality perception supply chain management company. Where the results infer that the employee's knowledge on reliability after the implementation of KMS approach showed a two-tailed p-value less than 0.05 for all the variables. Hence, the results suggest that employee's knowledge on reliability after the implementation of KMS approach have a significant influence on customers' quality perception in supply chain management company, which indicates the rejection of null hypothesis. The results thus showed a greater influence on employee's knowledge on reliability after the implementation of KMS approach in supply chain management company.

5. Conclusions

Knowledge management systems (KMS) have been implemented by many organizations to aid in the management of the intellectual property and the development of sustainable competitive advantages. However, despite the efforts of academics and practitioners with regard to promoting the use of KMS, the rate of adoption remains relatively low. This study analysis the adoption of KMS approach, significantly enhances the employee's knowledge on tangibility and reliability thus influences the customer's quality expectation and perceptions. It was found that the adoption of KMS approach, enhances the employee's knowledge on tangibility and reliability and thus influences the customer's quality expectation and perceptions.

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