Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Prioritizing Critical Identified Factors Affecting Performance of Supply Chain Management in Indian Insurance Industry

Dr. Puspalata Mahapatra, Dr. Smruti Ranjan Das, Milan Tah , Dr.Sukanta Sarkar, Dr. Biswaranjan Parida, Dr. Suman Kalyan Chaudhury

1. Senior Assistant Professor, Department of Commerce, School of Economics & Commerce, KIIT Deemed to be University, Email: puspalatam2004@gmail.com
Orchid id: http://orcid.org/0000-0003-1333-0896
2. Assistant Professor, Department of Commerce, School of Economics & Commerce
KIIT Deemed to be University, Email: smrutiranjan.dasfcm@kiit.ac.in
Orchid id: 0009-0005-8029-1040
3.Research Scholar, School of Economics & Commerce, KIIT Deemed to be University
Email id- milanmili09@gmail.com
Orchid id - 0009-0006-4857-5892
4. Associate Professor (Former), Department of Economics, Gambella University, Ethiopia.
Email. sukantaeco@gmail.com.,
Ph.9856321179
5. Assistant Professor, School of Economics, XIM University
Email id- biswaranjan@xim.edu.in
Orchid iD:0009-0002-1908-4809
6. Faculty Member, Department of Business Administration, Berhampur University
Email id -sumankchaudhury72@gmail.com
Orchid id: https://orcid.org/0000-0003-3206-6090

Corresponding author: Dr. Suman Kalyan Chaudhury

ARTICLE INFO

Received: 18 Nov 2024
Revised: 26 Dec 2024
Accepted: 08 Jan 2025

ABSTRACT

The Insurance sector is highly regulated and intensely competitive, so its performance is largely a function of supply chain management practices. This paper establishes the factors responsible for efficient supply chain management (SCM) in the insurance sector. In this work, an empirical exploration of factors affecting the performance of SCM has been performed. The authors have also established a hierarchy of factors affecting the sector's SCM performance. This study examines the relative importance of factors associated with SCM to help managers focus on specific SCM issues in the insurance sector. A sample of 289 policyholders and industry experts were included in the study to respond to the structured questionnaire designed with the help of a Likert scale. From the literature review, 31 factors were identified and incorporated into the measurement scale. A 'PCA' was performed to extract factors and set the factor prioritization, and 'AHP,' as a tool for multi-criteria decision-making, was deployed. The findings reveal that six prominent constructs from the PCA were explored. As per AHP analysis, service-related factors top the list, followed by organizational commitment, company-specific, individual perception, environmental, and marketing-related factors.

Keywords: Insurance Industry, SCM, AHP, PCA, Policyholder

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/ **Research Article**

INTRODUCTION

With the return of the new normal in the post-COVID scenario, the insurance sector is experiencing a deluge of issues in supply chain practices. At this juncture, the online-savvy customers and work-from-home (WFH) sentiment of employees also significantly influence the supply chain. The rise of cross-selling companies such as Policy Bazar and banking-partnered insurance selling (Bancassurance) are fuelling the key supply chain prospects of insurance firms in India. The advent of insurance technologies and changing customer preferences have manifested myriads of scholarly engagements in establishing the linkage between SCM effectiveness and firm performance in the insurance sector. The present study is inspired by the facts presented by Saxena (2019), who states that in the current scenario, in both urban and rural areas, the awareness of insurance is not significant.

Drawing insights from the supply chain literature, this research work attempts to examine the following research questions:

(a) Which essential factors are responsible for driving the SCM performance of Insurance companies?
(b) How do we establish a hierarchy of factors that can aid in designing SCM strategies for enhancing firm effectiveness?

The role of the insurance sector is increasing rapidly, and it is considered one of the prominent determinants of the economic growth of a Country like India (Peleckienė et al., 2019). Every Organization, irrespective of its nature and type, needs to identify key factors for achieving effective SCM, which in turn helps consumers deliver the required service (Farokhian. S. & Sadeghi. T, 2011). According to Standard & Poor (2019), India is the second-largest insurance technology Market in the Asia Pacific. As of 1st Jan 2022, 57 Insurance Companies are operating in India, of which 24 are life insurance companies and 33 are Non-life Insurance Companies. Though India ranked 11th overall worldwide, its penetration (contribution to GDP) is 4.2%, which is much less than other Western countries, indicating a huge unserved and untapped market (IBEF, 2024). The Insurance Industry fosters economic growth and development by promoting financial stability, entrepreneurial activities, and mobilizing savings. At the same time, the industry is confronting many obstacles like poor rural participation, lack of financial liberty, lack of adequate capital investment, low penetration, and particularly non ineffective distribution channels, which hinder the successful performance of the Industry in India. Indian Insurance Industry, though, has undergone remarkable changes dealing with many products and services; there is ample scope to grow in penetration and density through various reforms and initiatives Bhamidipati (2014).

On the one hand, the Indian insurance sector has grown historically during the last few years. However, on the other hand, its contribution to the Global Insurance Market remains abysmally low (Ray et al., K, 2020). Indian Insurers lack sufficient capital, suffer from drastic financial health, especially public sector companies, rural participation is very low, and there is an increased dependence on their investment portfolio (Chhatoi B. P, & Pattanaik D.P, 2013; Toke et al., M, 2012). Many challenges hinder the growth of Indian insurers, forcing them to adopt harmful practices like under-charging premiums, miss-selling, and dependence on traditional distribution channels to become profitable. However, insurers need to establish a strong distribution mechanism following effective SCM, which should be rural-inclined and spread awareness and financial literacy among the people.

Identifying and ranking key influencing factors through PCA along with the AHP model from the standpoint of the success of SCM will help the insurers provide financial solidity and competitive advantages over the other Companies. (Sabbaghian & Edalaty, 2015). The Insurance Sector lacks individual awareness, and it has been proved that greater awareness will lead to high penetration, which can result from seamless marketing integration. The Supply Chain can help the industry by creating a network of related parties to the transaction function and providing the services (Ganapati, V, 2020). The supply chain will influence the service organization to provide quality service on a

sustainable basis, and it will help optimize the insurance industry's business performance. Customers will be satisfied with the service performance, whereas the successful performance of SCM will satisfy service providers like Indian insurers. So, there is a desperate need to introduce the concept of SCM to the insurance sector to deliver quality service, which improves customer service, significantly contributes to long-term survival and profitability, and helps to achieve growth. After identifying the key growth drivers of the Insurance Industry, prioritizing these factors through ranking is of great significance for the survival and growth of the industry (Kabassi, 2021). In some multiple decision-making situations, the MCDM model will help address the problems, which helps and enables the different stakeholders to make critical decisions under uncertain situations (Sałabun et al., 2020). Though many MCDM methods are available, specifically, AHP has been chosen by many researchers as a feasible technique due to its appropriateness and compatibility with other methods. Moreover, combining different techniques can help the investigator overthrow limitations and provide solid findings (Banihashemi et al., 2017). As there are no common key factors responsible for the success of SCM of all industries, and they vary from one market to another, in this study, an effort has been made to identify some crucial elements essential for the SCM of the Indian Insurance Industry to work successfully. (Cata, Teuta, 2003). A few studies have been published about the variables influencing SCM in the insurance sector. However, no study has been done to rank the critical SSCM aspects in the Indian insurance market.

Based on the research gap, the objectives of the study are as follows:

1. To explore the factors affecting the performance of SCM within the Indian Insurance Industry.
2. To establish a hierarchy of factors affecting the performance of SCM within the Indian Insurance Industry

These authors have configured the paper in the following manner: after the introduction to the elements responsible for the effective implementation of SSC, the primary driving force for this study, is provided in Section, Section-II deals with previous related works about Key Success factors, PCA and AHP, and Section III covers theoretical explanation about PCA and AHP along with its steps, section-IV is devoted to used methodology and empirical analysis with its findings followed in section -V which describes detailed discussions which were exhibited from the PCA & AHP model. Section -VI is the concluding section, which summarizes the entire article and suggests the direction for further research.

LITERATURE REVIEW

The discipline of supply chain management has garnered substantial research focus from the scholars of this ever-evolving stream of research. Since evolution, supply chain management has travelled along the trajectory of multiple factors contextual to technological innovation and economic transformation. Deducing the factors affecting supply chain management warrants a review of related literature established over time. This section contains the careful mining of this field for factor extraction from the previous works. Supply Chain Management (SCM) is an indispensable practice that fulfills customer expectations and improves customer value through resource integration (Mudgal et al., 2009). The insurance sector, in order to remain competitive in the long run, is spell-bound to augment its ‘SCM practices,' ‘service quality,' ‘customer satisfaction’ and ‘pricing of the product’ (Maryam et al. & Seyed Hossein Siadat, 2019). A recent study on the functioning of intermediaries in the supply chain management of the insurance sector was addressed in the context of Portugal and Ireland. The study yielded that SCM can be enhanced through inter-country collaboration (Dominique-Ferreira et al., 2024). New-age smart technologies have disrupted SCM practices, enhancing resilience and efficient partner selection mechanisms (Prentice et al., 2023). Research from the perspectives of critical success factors (CSF) was undertaken by Mahapatra (2020), who established that CSF analysis helps achieve strategic goals in SCM practices. In another stance, Mahapatra et al. (2021) have also demonstrated the impactable factors on SCM affecting the Organization's success. This CSF approach to SCM has been further advocated by (Selimović et al.,

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

2020), that the technical survivability maintains strong adherence to critical success factors, leading to conservation wastage of resources and capabilities. Critical factors such as service quality, customer satisfaction, and customer loyalty are important determinants of the performance of SCM in insurance companies (Radulovi et al., D. & Skerli, J, 2018). Supply chain research with multidimensional methodology is scarcely available in the existing literature. Among significant factors, 'Trust' as an affective component can cause higher customer satisfaction, reducing the increased persistence ratio (Haddadi & Yazdi, 2018). In the international scenario, a study on Kenyan insurance companies found that multiple services, suitable demography, case compliance requirements, and creative distribution channels are the most important factors for consideration (Barasa. K, 2016). In the same parlance, (Rajesh. C. Jampala, 2013) identified 'innovative products,' 'competitive premium,' and 'product promotion' as prominent factors for enhancing confidence and trust in insurance companies. He further explored that 'claim settlement' is the most important dimension for firm success in the insurance sector. A study conducted by Kamau, G.M (2013) through a factor analysis approach extracted 'better innovation,' 'effective marketing,' 'consumer awareness,' 'appropriate legal framework,' 'innovative distribution channel, ' 'strategic alliance,' and 'quick settlement of disputes' as factors of significant influence. A study on rural insurance enunciated that the success of SCM in Insurance also depends on the training and education of sales personnel in the sales channel. The rural context is contingent upon low ticket size and risk protection-oriented products and products with simple terms (Duan Miao, 2012). Farokhian has studied the integration of innovative technology with insurance. S. & Sadeghi. T (2011) exhibited that 'trust,' 'reliability,' and 'internet technologies' influence insurance companies' SCM practices. The AHP model has been widely accepted for multi-criteria decision-making. There is growing evidence of AHP application in supply chain research. A recent study by Bashokoh et al. (2023) ascertained seven factors affecting the SCM of the food industry by applying the AHP model. Insurance is a growing sector with opportunities for policyholders and the economy as a whole. Several surveys have been conducted over the years to forecast growth trends, future avenues, and challenges. A pioneering survey conducted by Accenture (2011) revealed that the prime drivers of SCM sustainability are 'new products,' 'efficient agents,' 'cross-selling, "upselling,' and 'customer retention.' The deployment of these two factors can increase firm competitiveness. From the existing body of knowledge, the evidence on SCM practices is limited to customers, sales personnel, and technology. This study presents a comprehensive factor exploration for SCM practices using AHP and PCA. Based on the synthesis of the existing literature and research gap, a conceptual framework has been proposed, as depicted below:

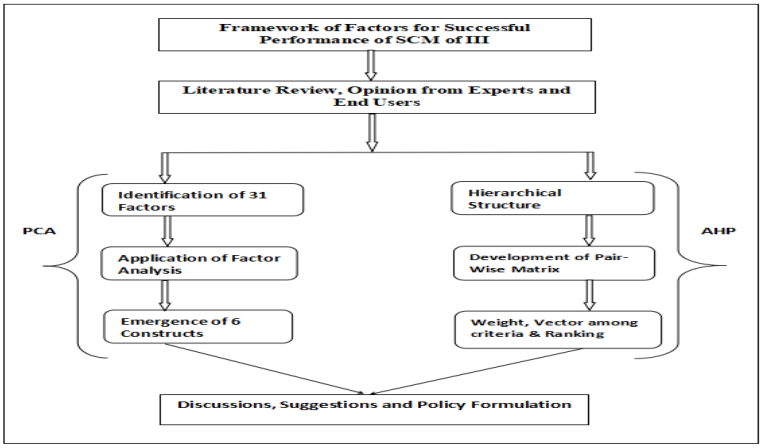

Figure 1: Conceptual Framework of the study

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

MATERIALS AND METHODS

The study is based on both primary data and secondary data. The extracted thirty-one factors are identified from the detailed literature review and opinions from the end users and insurance industry experts. The research has been carried out on a stratified random sampling basis with a sample size of 289 respondents, which is the sample size suggested by (Chhatoi et al., 2022) and (Sahoo et al., 2024), who have conducted similar studies on a sample size of 193 to 318. Data collection from respondents is confined to two major cities of Odisha, i.e., Cuttack and Bhubaneswar, and its surrounding areas. The primary data collection was through a self-administered questionnaire. Before data collection, a Pilot survey was conducted for a focus group of 45 insurance policyholders. Based on the pilot survey results, the questionnaire was changed, avoiding the technical words and replacing more related words. The primary data were analyzed using SPSS and in-depth interviews with the customers and insurance companies. Here, the respondents consisted of business people, professionals, homemakers, and government employees, and the insurers were from both the private and public sectors. The selection of experts is based on the criteria of having a minimum of ten years of experience in the Indian Insurance Industry. In this study, after data collection, researchers have used the PCA to find out the different constructs that influence the SCM in III. Principal component analysis (PCA) is a statistical method that summarizes big data table information by reducing the data and developing some constructs without losing their proprieties (Jolliffe & Cadima, 2016). The results derived from the PCA have been ranked by prioritizing them through the AHP method. Analytical Hierarchy Process, an MCDM (Multi-Criteria Decision Making) technique, helps to do a systematic study by identifying and ranking the factors. It is an effective mathematical tool that helps to make decisions with the presence of both multiple criteria and complex information. (Ansari et al., 2019). After identifying the key growth factors of SCM under PCA, the resulting dimensions were ranked using the AHP based on the perception of policyholders and experts from the insurance industry. In order to determine which factor is more important and significant for the success of service supply chain management (SCM) of the insurance industry, PCA was used to identify the key driver factors, followed by AHP to rank them (1-6). and to decide whether both the results are the same or if there are deviations between them.

Table 1: Profile of respondents

Gender	Frequency	% of response
Male	212	73.4
Female	77	26.6
Age		
21-30	71	24.6
31-40	62	21.5
41-50	55	19.0
51-60	101	34.9
Education		
Technical	76	26.3
Traditional	74	25.6
Professional	96	33.2
Others	43	14.9
Occupation		
Businessman	80	27.7
Service	85	29.4
Professional	86	29.8
Others	38	13.1
Marital Status		
Single	49	17

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Married	240	83
Location		
Rural	61	21.1
Semi-Urban	105	36.3
Urban	123	42.6
Monthly Income (Rs.)		
1-20000	67	23.2
20001-40000	82	28.4
40001-60000	58	20.1
60001 and above	82	28.4

Table 1 shows that out of 289 respondents, 73.4% belong to the male category, whereas 26.6% belong to the female category. Seventy-one respondents belong to the age group of 21-30, and 62 fall in the age group of 31-40. In the age group of 41-50, 55 respondents filled the questionnaire. A maximum of 101 respondents who belong to the age group of 51-60 have participated in the survey. Concerning educational background, 26.3% of respondents belong to the technical field, 25.6% are from a traditional background, and 33.2% are professionals. In contrast, the rest, 14.9%, are under the other category (Non-formal education like interaction with friends, family members, and colleagues). The table also depicts that 27.7% belong to the business category, 29.4 % of respondents belong to service, 29.8% of respondents belong to the profession, and only 43 respondents fall under the other category (Un organized sectors like artisans, daily workers, and rag pickers). Out of 289 respondents, 240 respondents are married, and 49 respondents belong to a single category. According to the number of respondents per location, the highest number of responses was from people from urban regions, 36.3%, and 21.1% from semi-urban and rural locations. Concerning monthly income, it is revealed that 82 respondents fall under Rs. 20001-40000 and Rs. 60001 and above categories.

RESULTS

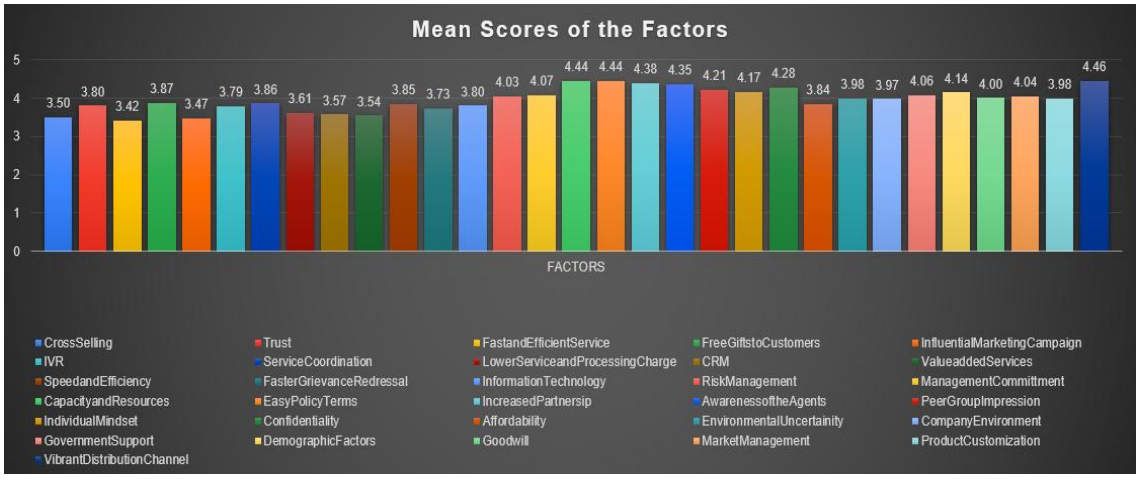

Figure 2: Mean Scores of the Factors

Figure 2 shows the mean scores of all 31 factors. The figure shows that the vibrant distribution channel has the maximum mean score among all the factors.

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Table 2: Descriptive statistics of factor (*n*=289)

Factors	Mean	SD	Skewness	Kurtosis
Cross Selling	3.5052	.97582	-.274	-.887
Trust	3.8028	.75406	-.929	.900
Fast and Efficient Service	3.4256	.84708	-.386	-.751
Free Gifts to Customers	3.8720	.70775	-.759	1.028
Influential Marketing Campaign	3.4775	.97913	-.160	-.920
Interactive Voice Response	3.7924	.86109	-.407	-.398
Service Coordination	3.8616	.57271	-.447	1.046
Lower Service & Processing Charge	3.6159	.72257	-.661	.142
Customer Relation Management	3.5744	.78318	-.576	.029
Value added Services	3.5433	.83273	-.429	-.288
Speed & Efficient Transactions	3.8512	.63081	-1.294	3.201
Faster Grievance Redressal System	3.7232	.85362	-.852	.267
Information Technology	3.8028	.79878	-.906	.622
Risk Management	4.0381	.60834	-.857	2.728
Management commitment	4.0727	.59940	-.612	2.040
Capacity & Resources Management	4.4429	.60469	-1.250	4.259
Easy Policy Terms	4.4464	.55094	-.539	.779
Increased Partnership	4.3875	.54197	-.070	-.970
Awareness of the Agents	4.3529	.62361	-.855	1.739
Peer Group Impression	4.2180	.59298	-.406	1.057
Individual Mindset	4.1730	.67533	-.768	1.792
Confidentiality	4.2872	.63235	-.319	-.669
Affordability	3.8443	.67699	-.409	.835
Environmental Uncertainty	3.9862	.64535	-.768	1.804
Company Environment	3.9758	.47445	-.664	3.882
Government Support	4.0692	.50900	-.042	1.526
Demographic Factors	4.1488	.56088	-.206	1.089
Goodwill of the Company	4.0069	.57126	-.787	3.731
Market Management	4.0450	.59633	-.509	1.659
Product Customization	3.9827	.59194	-.704	2.915
Vibrant Distribution Channel	4.4602	.63408	-1.166	2.614

Table 2 indicates the mean, standard deviation, kurtosis, and skewness of response values concerning different factors listed in the questionnaire. The higher the mean scores, the higher the expectation. The table shows that a vibrant distribution channel has more effect, followed by easy policy terms and capacity and resources management. The difference between low and high standard deviation is that data is more spread in the case of high standard deviation. A standard deviation value close to zero indicates that the data points are close to the mean, whereas a high or low standard deviation indicates that the data points are above or below the mean. A negative kurtosis value indicates that the distribution has peaked more than normal. The skewness value indicates that the data is right-tailed or left-tailed. In the above table, out of 31 factors, seven factors are negatively skewed, meaning that the left tail is longer. Both the within the range of -2 to +2 indicates the distribution is normal (Sarstedt et al., 2022). All the variables of the study are normally distributed as the scores of both the statistics are close to the acceptable range.

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/ **Research Article**

A. Application of Principal Component Analysis (PCA)

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.929	0.928	31

From the result in Table 3, the Cronbach's alpha value is 0.928. It implies that there is a high degree of internal consistency among the items. Cronbach's alpha estimates the reliability and shows how well the set of items or variables measures a single unidimensional latent construct. Normally, a reliability coefficient generates values that range from 0 to 1. A value closer to 1 indicates a more reliable measure. 0.8 and above is considered the standard acceptable value for reliability coefficients (Griethuijsen et al., 2014)

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.878
Bartlett's Test of Sphericity	Approx. Chi-Square	7411.550
	Df	465
	Sig.	0.000

Table 4 shows that the KMO value is 0.878, and the Bartlett's Test of Sphericity value is 0.000 ($p<0.001$). This implies that the factors can be considered for factor analysis. Before conducting the factor analysis, the Kaiser-Meyer-Olkin test, otherwise called the KMO test, and Bartlett's test of sphericity was conducted. The KMO test measures the adequacy of the sample of each variable in the model for the study and the overall model as well. Values less than 0.05 show that the matrix is not an identity matrix, and hence, we reject the null hypothesis, and factor analysis of the data can be done. These tests help to find the suitability of the data set for conducting factor analysis. Further, factor analysis was done to identify and club similar factors into major ones, and details of factor analysis are mentioned in the paragraph below.

Table 5: Extraction Table

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative %	Total	Variance (%)	Cumulative %
1	10.645	34.339	34.339	10.645	34.339	34.339	7.474	24.109	24.109
2	5.533	17.847	52.186	5.533	17.847	52.186	3.382	10.910	35.018
3	1.921	6.196	58.381	1.921	6.196	58.381	3.195	10.306	45.324
4	1.670	5.388	63.770	1.670	5.388	63.770	3.161	10.197	55.521
5	1.452	4.683	68.453	1.452	4.683	68.453	2.548	8.219	63.740
6	1.055	3.404	71.857	1.055	3.404	71.857	2.516	8.117	71.857

The above-mentioned table (5) highlights the variance observed among all the factors as well as Eigenvalues (total and in %). It is observed that out of the 31 factors, only six have values >1, which is a pre-determined common criterion for the factors to be useful for analysis. Here, these six factors find the largest variance, which stands at 71.857% of the total variance.

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/ **Research Article**

Table 6: Constructs Derived from Questionnaire

Constructs and constituent factors and narration	Factor loadings	Cronbach's Alfa	Standardized regression weight
1. SERVICE-RELATED FACTORS		**0.942**	
Cross-selling	.683		0.975*
Trust	.601		0.754*
Fast and Efficient Service	.856		0.847*
Referral System	.655		0.707*
Influential Marketing Campaign	.843		0.979*
Interactive Voice Response	.763		0.861*
Service Coordination	.439		0.572*
Lower Service & Processing Charge	.791		0.722*
CRM	.822		0.783*
Value added Services	.839		0.832*
Speed and Efficiency of Transactions	.610		0.630*
Faster Grievance Redressal System	.767		0.853*
2. ORGANIZATIONAL COMMITMENT FACTORS		**.879**	
Information Technology	.654		0.798*
Risk Management	.819		0.608*
Management Commitment	.805		0.599*
3. COMPANY-SPECIFIC FACTORS		**.885**	
Capacity and Resources Management	.717		0.604*
Easy Policy Terms (strategy)	.838		0.550*
Increased Partnership	.864		0.541*
Awareness of the Agents and public	.873		0.623*
4. INDIVIDUAL PERCEPTUAL FACTORS		**.853**	
Peer Group Impression	.820		0.592*
Individual Mindset	.856		0.675*
Confidentiality	.789		0.632*
Affordability	.622		0.676*
5. ENVIRONMENTAL FACTORS		**.728**	
Environmental Uncertainty	.419		0.645*
Company Environment	.538		0.474*
Government Support	.574		0.509*
Demographic Factors	.701		0.560*
Goodwill of the Company	.621		0.571*
6. MARKET-RELATED FACTORS		**.784**	
Market Management	.748		0.596*
Product Customization	.767		0.591*
Vibrant Distribution Channel	.630		0.634*

Table 6 shows the Rotated Component Matrix of the key driving forces affecting the service supply chain industry. There are 31 factors that explain the key driving forces affecting the service supply chain industry, and these 31 factors overlap with six major factors. Cross Selling, Trust, Fast and Efficient Service, Referral System, Influential Marketing Campaign, IVR, Service Coordination, Lower Service and Processing Charge, CRM, Value Added Services, Speed and Efficiency of Transactions, and Faster Grievance Redressal System are renamed as 'SERVICE-RELATED FACTORS.' Information Technology, Risk Management, and Management Commitment have been clubbed into a factor as 'ORGANIZATIONAL COMMITMENT FACTORS.' The factor renamed 'COMPANY SPECIFIC FACTORS' has factors like capacity and resources management, easy policy terms, increased partnership, and awareness of the agents and public. 'INDIVIDUAL PERCEPTION FACTORS' is the renamed factor that consists of Peer Group Impression, Individual mindset,

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/ **Research Article**

Confidentiality, and Affordability. Environmental Uncertainty, Company Environment, Government Support, Demographic Factors, and the Reputation of the Company are termed 'ENVIRONMENTAL FACTORS.' The factor renamed as 'MARKET-RELATED FACTORS' has factors like Market Management, Product Customization, and Vibrant Distribution Channels. The Cronbach's Alfa Value for Service-Related Factors, Organizational Commitment Factors, Company Specific Factors, Individual Perception Factors, Environmental Factors, and Market-Related Factors have values of 0.942, 0.879, 0.885, 0.853, 0.728, and 0.784, respectively. The beta coefficient, which is the standardized regression weight, measures the degree of impact of the independent variable on the dependent. Where the calculated beta coefficient absolute value is higher, that will reflect a stronger effect between independent and dependent variables under the study.

B. Application of AHP Method:

To get the top-ranked factors on the basis of weightage, here the study used the AHP Method, and the factors that get the highest weightage have a strong importance for the success of SCM of III. The AHP method starts with a pair-wise comparison based on hierarchy trees by the decision maker. Under this hierarchy tree, each factor will be compared with other factors for which weightage is also to be assigned. In the final stage, one integrated matrix will be formulated, and the final decision will be taken on the basis of rank.

Table 7: Pair-wise Comparison Matrix

	SRF	OCF	MRF	EF	CSF	IPF
SRF	1.0000	2.0000	2.2000	2.4000	2.1000	3.0000
OCF	0.5000	1.0000	3.0000	2.9000	0.4348	2.9000
MRF	0.4545	0.3333	1.0000	0.5882	0.3448	0.3125
EF	0.4167	0.3448	1.7001	1.0000	0.3846	2.0000
CSF	0.4762	2.2999	2.9000	2.6000	1.0000	0.3125
IPF	0.3333	0.3448	3.2000	0.5000	3.2000	1.0000
Sum=	3.1807	6.3229	14.0001	9.9882	7.4642	9.5250

Under the study of the hierarchical structure, the pairwise comparison matrix (7), along with the judgment matrix, has been presented in Table no (8). In this table, the vector score has been displayed after evaluating the different options with respect to the criteria.

Table 8: Criteria weightage and ranking of factors

	SRF	OCF	MRF	EF	CSF	IPF	Criteria weights	Ranking
SRF	0.314392	0.31631072	0.157141 7	0.240283	0.281341	0.314960	0.2707384	1
OCF	0.157196	0.15815536	0.214284 1	0.290342	0.058251	0.304461	0.1971152	2
MRF	0.142905	0.05271845	0.071428 0	0.058889	0.046197	0.032808	0.0674912	6
EF	0.130996	0.05453633	0.121434 9	0.100118	0.051527	0.209973	0.1114313	5
CSF	0.149710	0.36374278	0.207141 3	0.260307	0.133972	0.032808	0.1912804	3
IPF	0.104797	0.05453633	0.228569 7	0.050059	0.428710	0.104986	0.1619433	4

λ_{max} -9.387994218, C.I- 0.060999277, C. R-0.034171915, Random Index (9)-1.45

In the above table (8), the ranking of different factors that are influencing the SCM of the insurance industry is displayed, for which both local and global rankings have been applied. After completion of the wise comparison, weights were allotted to each and every factor or to different alternatives under each criterion by referring to the (1-9) scale of the city's table.

Journal of Information Systems Engineering and Management
2025, 10(3)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

The outcomes of the PCA, which was conducted to identify the primary determinants of the SCM of the insurance industry's successful performance, are very notable, and here 31 factors turned up which were captured under six constructs named 1 (Overall Service) which is a powerful weapon having the variance of 24.11% and includes 12 indicators for the success of SCM followed by 2 (Organisational Commitment) which is a superior instrument includes three factors having the variance value 10.91%, Constructs 3 (Company specific) which is a very dynamic elements covers four factors (10.306%), Construct 4 (Perceptional) which is catchy instrument includes also four factors having the contribution 10.197% and last two constructs are like 5 (Environmental)with variance value 8.19% and 6 (Marketing) having the contribution of 8.117% with all total of 71.857 variance accounted by all components which are in charge of the Indian Insurance Industry's SCM's success. On the basis of AHP results, the study clearly finds that among the six relevant factors, Service-related factors are the top-ranked, and high-quality performance is crucial for the insurance industry's SCM, followed by Organisational Commitment(2nd) and company-specific (3rd). Individual perception (4^{th}), environmental (5th), and Marketing-related factors are the least ranked factors. The findings are consistent with the outcomes of the PCA. The analysis of the study by using multiple methods like AHP and PCA reveals the same results with respect to prioritizing and ranking the factors that are significant for the success of the insurance industry SCM. In the current cutthroat competition era, every Organization, irrespective of their size and nature, tries to win the competitive edge by adopting the different strategies that are best fit for them, so here, the insurance industry should focus more on the service-related factors to avail the convincing advantage over than other Insurers operating in India.

DISCUSSION

The present study shares a wide array of advocacy and contradictions with the existing research works pertaining to the insurance sector. The current study's outcome stands apart from the prevailing conventions by researchers and shares the same notion with a few authors (Mahapatra et al., 2021). According to Sabbaghian and Edalaty (2015), performance, motivation, and active agents are the key drivers for the success of the SCM in the insurance industry. The arguments put forth by Mahapatra et al. (2021), the principal factors for the successful performance of SSCM in the Indian Insurance Industry are product customization, policy terms, CRM, Affordability, and awareness, which are confirmed by the present study. Here, the study tries to explore and rank the key factors that are accountable for the improved performance of the SCM in the Indian insurance industry, which is the novelty of this study.

CONCLUSION

The present study has gathered evidence on the factors responsible for affecting the SCM performance of insurance companies. Through AHP and PCA, the six fundamental factors have been explored and ranked as per priority. These six factors include service-related factors, organizational commitment factors, Company-specific factors, individual perception factors, environmental factors, and marketing-related factors.

Most of the service sectors, including the insurance industry, realize that in order to attain sustainable growth and become successful, their SCM needs to be strengthened. In this study, efforts have been put into pointing out the important, influential factors, along with their ranking, that are beneficial for the insurance sector's adoption of SCM in India. Here, the study tries to give an extensive picture of all reliable factors for the successful achievement of SCM in the insurance sector, which can be used as ready reckon by the government. IRDA, policymakers, and insurance companies. Moreover, the findings of this study will offer a road map for existing insurers to design their supply chain to gain a competitive advantage over others. As an essential/imperative management tool, PCA and the application of the AHP method provide the necessary support for the performance improvement of the Indian Insurance Industry in the pursuit of SCM. The objective of exploring key factors for the implementation of SCM in the insurance sector is to identify the barriers that will

increase its competitiveness, profitability, and overall quality of services to its customers. To make SSCM strong and successful, the industry should adopt credible and convenient customer service and implement a service system like “Service at all household doorsteps and all town outlets." So, to achieve profitable growth ins, insurance companies should develop integrated multi-channel distribution methods, which is the buzzword of today’s scenario. The study here has examined a number of factors, and substantial knowledge about these factors will help the Government, IRDA, and insurers frame the policy for the success of the industry and economic development of the country. The findings of the study will enrich the current literature by updating the knowledge through the new sets of factors about key growth drivers by applying mixed statistical methods. The outcomes of the existing study will significantly contribute to the development of a new set of factors along with the application of the different combined methodologies for analyzing the variables in the pursuit of SCM in the Indian Insurance Industry. The current study provides ideas to the government and policymakers like IRDA on how to implement and promote insurance companies. The finding of the study suggests that overall service, followed by organizational commitment factors, is the most important and top-ranked growth driver of supply chain management in Indian insurers. A combination of both these models can be used in various industries, and other researchers can use these ranked key factors to assess their effect under different methods like DEMATEL. The study provides a road map that will be helpful to the Indian insurance industry in prioritizing and allocating limited resources for successful performance with respect to profitability, market share, and increased premium and density. The present work sought to explore the prospective factors influencing SSCM in the Indian Insurance Industry.

Some of the acknowledged limitations of this study are that people do not prefer to answer the questionnaire, the pairwise comparison is hard for them, and they also take a lot of time. The present study has considered policyholders randomly without considering the nature of the policy and the scope of the underwriter. This may hinder the prospect of generalization of the study. Further, the cultural context of insurance has not been incorporated in the study. This may have a limiting impact on the relevance of the study. Future investigators can conduct their study by diversifying their methodological approach rather than using only one method for decision-making.

Authors Contribution: Conceptualization: PM, SKC, SRD, SJ, BRP and MT, Methodology: PM, SKC, BRP, Software: PM, Validation: PM, SKC, SRD, Formal Analysis: PM, SKC, SRD, Investigation: PM, SKC, SJ, MT, Resources: PM, Data Curation: PM, SKC, Writing Original Draft Preparation: PM, SKC, BRP, Writing –Review & Editing: PM, SKC, Visualization: PM, SRD, SJ, Supervision: PM, SKC, Project Administration: PM, Funding Acquisition: SRD.

REFERENCES

[1] Accenture. (2011). *The Path to High Performance in Insurance: Transforming Distribution and Marketing with Predictive Analytics* [Technical].

[2] Ansari, Z., Tabash, M. I., Akhtar, A., Khan, S. H., & Al-Matari, E. M. (2019). Identifying and ranking the driving forces of social insurance by analytical hierarchy process: Evidence from India. *Heliyon*, *5*(10), e02683. https://doi.org/10.1016/j.heliyon.2019.e02683

[3] Banihashemi, S., Hosseini, M. R., Golizadeh, H., & Sankaran, S. (2017). Critical success factors (CSFs) for integration of sustainability into construction project management practices in developing countries. *International Journal of Project Management*, *35*(6), 1103–1119. https://doi.org/10.1016/j.ijproman.2017.01.014

[4] Barasa. K. (2016). *To identify a framework for adoption by insurance industry for enhancing Insurance penetration* [Strathmore University]. http://suplus.strathmore.edu.handle/11071/4779

[5] Bashokoh, M. I., Akhlagh, E. M., Gholizadeh, M. H., Soori, A., Sahebi, A. G., & Gholami, S. (2023). Identifying and Prioritizing Factors Affecting Financing Performance of The Supply Chain in Food Industry SMEs. *International Journal of Entrepreneurship, Business and Creative Economy*, *3*(2), 74–91. https://doi.org/10.31098/ijebce.v3i2.1592

[6] Cata, Teuta. (2003). *Critical success factors for e -service: An exploratory study of Web - based insurance business* [Dissertation, University of Nebraska]. https://www.proquest.com/openview/e3836ef129a958859fobe5002c118544/1?pq-origsite=gscholar&cbl=18750&diss=y
[7] Chhatoi B. P, & Pattanaik D.P. (2013). Performance of Non-life Insurer in India – A Comparative Study between Pre and Post reform Period. *Kushagra International Management Review*, *3*(2), 46–60.
[8] Chhatoi, B. P., Sahoo, S. P., & Dash, M. K. (2022). Practical gender needs and women empowerment: An impact assessment of microfinance. *International Journal of Business Excellence*, *28*(4), 522. https://doi.org/10.1504/IJBEX.2022.127499
[9] Dominique-Ferreira, S., Brophy, R., & Prentice, C. (2024). A comparative analysis of supply chain management between Portugal and Ireland. *European Journal of Management and Business Economics*. https://doi.org/10.1108/EJMBE-04-2022-0118
[10] Duan Miao. (2012). *Strategic Management and Marketing Strategy in Insurance Companies*. Lahti University of Applied Sciences.
[11] Farokhian. S. & Sadeghi. T. (2011). The Determination of the Critical Success Factors (CSFs) in Insurance Services in Iran. *Asian Journal of Business Management Studies*, *2*(1), 4–6.
[12] Ganapati, V. (2020). The Insurance Service Supply Chain. *Catalyst – Journal of Business Management*, *3*(2), 1–15.
[13] Haddadi, M., & Yazdi, A. K. (2018). Prioritising critical successful factors of knowledge management in insurance companies. *International Journal of Operational Research*, *31*(3), 281. https://doi.org/10.1504/IJOR.2018.10010396
[14] IBEF. (2024). *Insurance Industry Report* [Technical]. Ministry of Commerce and Industry. https://www.ibef.org/
[15] Jolliffe, I. T., & Cadima, J. (2016). Principal component analysis: A review and recent developments. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *374*(2065), 20150202. https://doi.org/10.1098/rsta.2015.0202
[16] Kabassi, K. (2021). Application of Multi-Criteria Decision-Making Models for the Evaluation Cultural Websites: A Framework for Comparative Analysis. *Information*, *12*(10), 407. https://doi.org/10.3390/info12100407
[17] Kamau, G.M. (2013). Factors Contributing to Low Insurance Penetration in Kenya. *International Journal of Social Sciences and Entrepreneurship*, *1*(2), 463–469.
[18] Mahapatra, P. (2020). Prioritizing and Classifying the Impact of Factors of Overseas Investment on Indian Insurance Industry: An AHP Approach. *International Journal of Management (IJM)*, *11*(7), 1467–1474. https://doi.org/10.34218/IJM.11.7.2020.130
[19] Mahapatra, P., Tripathy, S., & Panda, S. K. (2021). Factors Influencing of SSCM Performance of the Indian Insurance Industry: An ISM Approach. *International Journal of System Dynamics Applications*, *10*(4), 1–18. https://doi.org/10.4018/IJSDA.20211001.oa5
[20] Maryam Mohseni & Ali Abdollahi & Seyed Hossein Siadat. (2019). Sustainable Supply Chain Management Practices in Petrochemical Industry Using Interpretive Structural Modeling. *International Journal of Information Systems and Supply Chain Management*, *12*(1), 22–50.
[21] Mudgal, R. K., Shankar, R., Talib, P., & Raj, T. (2009). Greening the supply chain practices: An Indian perspective of enablers' relationships. *International Journal of Advanced Operations Management*, *1*(2/3), 151. https://doi.org/10.1504/IJAOM.2009.030671
[22] Peleckienė, V., Peleckis, K., Dudzevičiūtė, G., & Peleckis, K. K. (2019). The relationship between insurance and economic growth: Evidence from the European Union countries. *Economic Research-Ekonomska Istraživanja*, *32*(1), 1138–1151. https://doi.org/10.1080/1331677X.2019.1588765
[23] Prentice, C., Dominique-Ferreira, S., & Wang, X. (2023). Supply chain management in the insurance industry – symmetrical and asymmetrical analysis. *Journal of Business & Industrial Marketing*, *38*(11), 2505–2518. https://doi.org/10.1108/JBIM-07-2022-0305

[24] Radulovi, J., Nikoli, D. & Skerli, J. (2018). *Investigation and development of Serbian zero-net energy house*. 3rd International Conference on Quality of Life, Serbia.
[25] Rajesh. C. Jampala. (2013). *Marketing Mix of LIC of India in Kanyakumari District—A study with reference to policy Holders*. Manonmaniam Sundaranar University.
[26] Ray, S., Thakur, V. & Bandyopadhyay, K. (2020). *India's insurance sector: Challenges and Opportunities* [Working Paper]. Indian Council for Research on International Economic Relations. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://icrier.org/pdf/Working_Paper_394.pdf
[27] Sabbaghian, A., & Edalaty, M. (2015). Identification and prioritization the factors affecting the insurance industry customer preferences using KANO and AHP model (case study:the city of Kashan(. *Ciência e Natura*, *37*, 426. https://doi.org/10.5902/2179460X20873
[28] Sahoo, S. P., Chhatoi, B. P., & Chaudhury, S. K. (2024). Factor exploration for creating an agile workforce: An Indian experience. *International Journal of Intelligent Enterprise*, *11*(3), 203–222. https://doi.org/10.1504/IJIE.2024.139789
[29] Sałabun, W., Wątróbski, J., & Shekhovtsov, A. (2020). Are MCDA Methods Benchmarkable? A Comparative Study of TOPSIS, VIKOR, COPRAS, and PROMETHEE II Methods. *Symmetry*, *12*(9), 1549. https://doi.org/10.3390/sym12091549
[30] Sarstedt, M., Ringle, C. M., & Hair, J. F. (2022). Partial Least Squares Structural Equation Modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of Market Research* (pp. 587–632). Springer International Publishing. https://doi.org/10.1007/978-3-319-57413-4_15
[31] Saxena, S. (2019). Insurance and Rural Development; Challenges and Opportunity. *The Journal of Insurance Institute of India*, *7*(1), 70–74.
[32] Selimović, J., Martinović, D., & Hurko, D. (2020). Critical success factors in insurance companies. *Management*, *25*(1), 215–233. https://doi.org/10.30924/mjcmi.25.1.12
[33] Standard & Poor. (2019). *The S&P Global Market Intelligence 2019 ESG Survey* [Technical].
[34] Toke, L.K., Gupta, R.C., & Dandekar, M. (2012). An empirical study of green supply chain management in Indian perspective. *International Journal of Applied Science and Engineering Research*, *1*, 372–383.