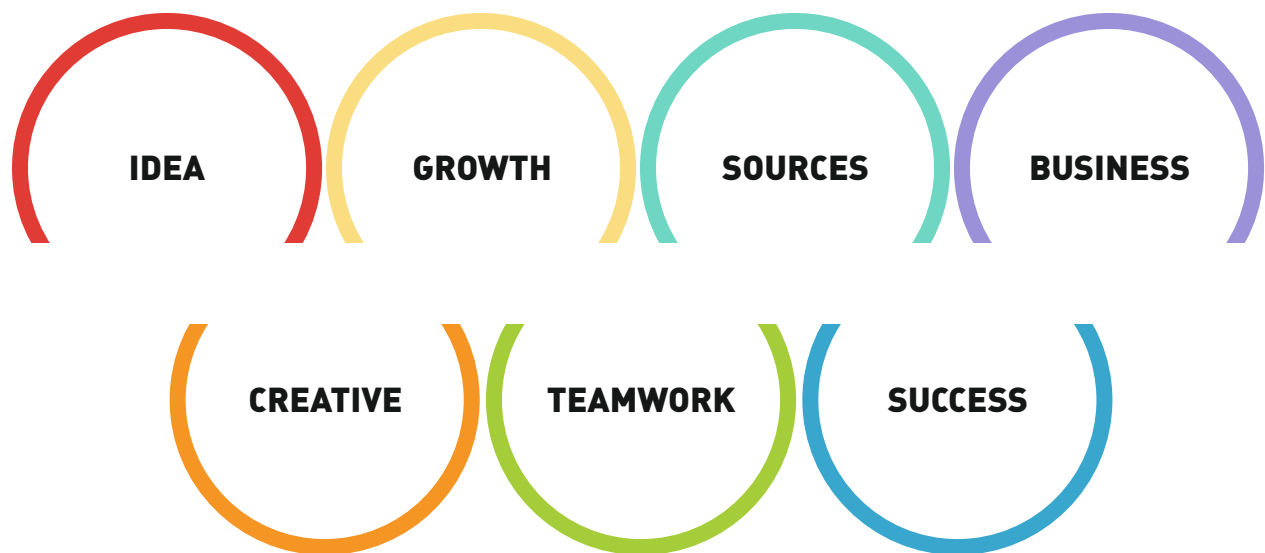


# BIZCRAFT

Journal of  
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## SRMS



### RESEARCH ARTICLES

- **Consumer Durable Dynamic Revolution A Systematic Literature Review, Bibliometric Analysis, Meta-Analysis, Clustering and Research Gaps**
- **Exploring Employee Motivation: An Integrated Approach Using Systematic Review, Bibliometric Analysis, Meta Analytic Techniques, and Cluster Based Thematic Mapping**
- **Advance Patient Care: A Systematic Literature Review**
- **A Comprehensive Analysis of Digital Literacy: Systematic Review, Bibliometrics, Meta-Analysis, and Emerging Research Gaps**

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## About SRMS College of Engineering & Technology Bareilly

Shri Ram Murti Smarak College of Engineering & Technology has an independent residential campus spread over 35 acres of land with all weather roads, lush green lawns, playgrounds, Multi-Purpose Hall, Gymnasium, Squash Court and 53020 sq.m. of built up area on the campus. The campus is aesthetically planned and designed with exquisite facilities.

The college offers courses of undergraduate and postgraduate levels, with a professional or vocational orientation to internationally recognized standards of excellence. All courses lay emphasis on practicals and are multi-disciplinary in approach. The college inculcates Values, Ethics in its students, so that the PRIDE of SRMSCET will become the ASSET of our Nation.

The college has demonstrated the perennial evidence for merit and quality. It is developing by leaps and bounds in terms of infrastructural facilities and human capital not only to fulfill the requirements of the current technological status but also to set itself as teaching and research centre of eminence in future.

### 27 YEARS OF QUALITY EDUCATION :

- SRMS College of Engineering and Technology (CET), Bareilly has signed a Memorandum of Understanding (MOU) with the prestigious National Taipei University of Business (NTUB), Taiwan on 24th July 2023.
- SRMS Trust Chairman Shri Dev Murti Ji conferred with Achiever Award for remarkable contribution in Medical Service by Central UP Chamber of Commerce and Industry on 22nd June 2023.
- SRMS Institutions signed MoU with UN Global Compact Network India to drive sustainable development practices on 28th April 2023.
- Chairman, SRMS Trust, Shri Dev Murti Ji honoured with 'Uday Utkrashtta Samman 2023' award by Deputy CM, UP on 19th February 2023, for his commitment to quality education and healthcare services in the region.
- Faculty of Management Science, SRMSCET, Bareilly ranked 38th in North Zone among India's Best B-Schools, 116th ranked in Private Institute, 142nd ranked in private schools by Fortune India in Nov. 2022, Vol.13. N-1.
- Shri Aditya Murti Ji, Director, SRMS IMS received the Prestigious Rohilkhand Management Association (RMA) Achievers Award 2021.
- Achieved TOP 55th Rank B-Schools Region-Wise Private-North by Business World in 19th November 2022.
- Achieved TOP 56th Rank B-Schools Region-Wise Private-North by Business World in 2021.
- Rohilkhand Management Association Excellence Award 2020.
- Winner of Rohilkhand Management Association Excellence Award- 2020 for its remarkable achievements in health care services.
- Management Excellence Award 2019.
- Brand Icons Rohilkhand Award 2018.

## **Editor**

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## **Editor**

Dr. Deepanshi

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Faculty of Management Science

Shri Ram Murti Smarak

College of Engineering & Technology,

Bareilly

- Excellence Award for Higher Education in India 2017.
- Brand Icons of Rohilkhand Award 2016.
- Education Excellence Award given by Times of India in the year of 2015.
- Edupreneurs Award -2013 Vice Chancellors choice to the Chairman of the institution.
- Education Excellence Award given by CMAI Association of India in association with Times of India in the year 2013.
- Skill Tree knowledge Evangelist of India - 2013 for the outstanding contributions to the advancement of higher education system.
- Winner of National Employability Award -2012 by AMCAT.
- Awarded by Dr. Ram Manohar Lohiya Laghu Udhmi Protsahan Pradeshik Puruskar given by MSME &EPD, Govt. of U.P. in Education in the year 2011.
- Winner of National Awards for excellence in education -2011 in Indian Education awards -2011.
- The College is a STAR Performer College of UPTU now AKTU and winner of Excellence Award in B.Tech., B.Pharm, MBA & MCA in year 2009 and 2010 continuously.
- Winner of Academic Excellence Award of UPTU for MBA, B.Tech and B.Pharm in year 2008 and 2009 continuously.
- College has been selected for the Technical Education Quality Improvement Programme of National Project Implementation Unit of the Government of India financed by the World Bank.
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## About FMS

(Faculty of Management Science)

Shri Ram Murti Smarak College of Engineering and Technology, Bareilly, UP has been offering its prestigious management programme since 1996. MBA from this college is known for its quality & perfection and recognized by industries for its practical orientations. The alumni of MBA course from this college are working at leading positions in the companies of repute. The Faculty of Management Science conducts various value addition activities also such as Campus Outreach Programmes, Management Development Programmes, Faculty Development Programmes & Interdisciplinary International Conferences, Certified Courses.

MBA from this college is among top ranked in the affiliating university since the beginning and awarded with Academic Excellence Awards of the university. A high degree of interaction is maintained with industries for imparting practical training. The department offers comprehensive management education blended with Entrepreneurship development, Case study, Economic policy analysis etc. Certification courses in Finance, Insurance, International Business, Project management & HR Management provides extra edge to the students of SRMS Bareilly & they are ready by to move from campus to corporate.

The department is having well equipped Class Rooms, Computer Lab, Seminar Halls, Team Rooms etc. to provide best required infrastructure for effective teaching and learning process. In order to promote research, the department publishes management journal Bizcraft (ISSN: 2231-0231, RNI No: UPEGN/2007/19207).

## About The Journal

Bizcraft, the Journal of Management Sciences (FMS SRMS) is a bi-annual, peer reviewed journal with national circulation.

It publishes original communications of research that advances, illuminates Management science and that educates the journal readers.

Manuscripts dealing management aspects will be considered for publication, provided. They contain results of original investigations. Articles need to be of general interest - e.g., they cross the boundaries of specialties or are of sufficient novelty and importance that the journal's readers, whatever their specialty, should be made aware of the findings.

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The FMS SRMS prefers the original research work done by Faculties or Management for their research work.

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## From Editor's Desk



Mr. Raghawendra Kumar  
Editor

Dear Readers,

It is with considerable pleasure that I present the latest issue of our international management journal. As Editor, I am privileged to introduce a rigorously selected collection of scholarly articles and empirical studies that contribute meaningfully to the expanding body of knowledge in management research.

This issue brings together a diverse set of high-quality contributions that critically engage with contemporary management theories, practices, and strategic frameworks. The authors—drawn from both academia and industry—offer nuanced perspectives on emerging trends, complex challenges, and evolving opportunities within the global management landscape. Their work reflects methodological rigor, theoretical depth, and practical relevance, addressing issues of significance to an international readership.

The journal remains firmly committed to upholding the highest standards of academic excellence and ethical publishing practices. All manuscripts included in this issue have undergone a comprehensive double-blind peer-review process

to ensure originality, analytical rigor, and scholarly contribution. I extend my sincere appreciation to our reviewers and editorial board members for their invaluable expertise, diligence, and dedication to maintaining the journal's intellectual integrity.

I would also like to acknowledge and thank the authors for their confidence in our journal as a platform for disseminating their research. Their contributions not only enhance the quality of this issue but also serve as an important resource for researchers, educators, policymakers, and practitioners seeking informed insights into contemporary management discourse.

We anticipate that the research presented in this issue will stimulate critical dialogue, encourage further scholarly inquiry, and support evidence-based practice in the field of management. Readers are invited to engage deeply with the articles and to contribute to the ongoing academic conversation through reflection, citation, and future research.

We are grateful for the continued support of our readers and contributors worldwide. We look forward to advancing impactful scholarship and fostering global academic exchange in forthcoming issues as we collectively shape the future of management research.

Warm regards,  
Editor  
Mr. Raghawendra Kumar

# From Editor's Desk



Dr. Deepanshi  
Editor

Dear Readers,

It gives me great pleasure to present the latest edition of our distinguished journal in the field of management. As an Editor, I am honoured to share with you a thoughtfully curated collection of scholarly articles and research papers that illuminate the dynamic and multifaceted world of management.

This issue brings together a diverse range of perspectives on contemporary management practices and strategies. Our contributors renowned academicians, scholars, students and seasoned industry practitioners have examined emerging trends, pressing challenges, and promising opportunities that continue to shape the discipline today.

In keeping with our commitment to excellence, every article has undergone a rigorous peer-review process to ensure accuracy, relevance, and scholarly

integrity. I extend my sincere gratitude to our reviewers and editorial board members for their invaluable expertise and dedication, which uphold the high standards of our publication.

We are equally indebted to the authors whose research and insights enrich this issue. Their contributions make the journal a vital resource for scholars, practitioners, and students, offering fresh perspectives and keeping readers informed about the latest developments in management.

It is our hope that this edition will spark meaningful dialogue, inspire further inquiry, and encourage innovation within the management community. We invite you to explore the articles that resonate with your interests, engage with the ideas presented, and share your reflections with peers and colleagues.

Thank you for your continued support. We look forward to bring you more engaging content in the issues ahead as we collectively explore and shape the future of management.

Warm Regards,  
Editor  
Dr. Deepanshi

# From the Desk of Editor-in-Chief



Dr. Mohd Danish Chishti  
Editor-in-Chief

I hope this message finds you in good health and high spirits. As we embark on a new phase of knowledge dissemination and scholarly exploration, I wanted to take a moment to reflect on the journey we have undertaken together and share my thoughts on the path ahead.

Our management journal has always been a platform for the exchange of innovative ideas, cutting-edge research, and insightful perspectives. Over the years, we have witnessed remarkable contributions from scholars, practitioners, and visionaries. Your dedication to advancing the field of management has been instrumental in shaping the journal's reputation for excellence.

The landscape of management is evolving at an unprecedented pace, driven by technological advancements, changing market dynamics, and a renewed emphasis on sustainable practices. Our journal will continue to serve as a compass, guiding us through these dynamic shifts and fostering dialogue that fuels progress.

I encourage each of you to consider the journal not only as a platform for publication but as a community of thought leaders who are shaping the future of management. Your contributions, whether in the form of research articles, case studies, or thought-provoking commentaries, are the lifeblood of our journal. Together, we can spark discussions, challenge assumptions, and drive the evolution of management theory and practice.

In the spirit of collaboration and academic camaraderie, I invite you to engage actively with our journal. Share your insights, participate in peer review processes, and join us in our commitment to advancing knowledge and driving positive change. Your expertise and dedication are the cornerstones of our success, and I am deeply grateful for your continued support.

Thank you for being an integral part of our journal's journey. Let us move forward with renewed vigor, embracing the opportunities that lie ahead and collectively contributing to the advancement of management scholarship.

Editor -in- Chief  
Dr. Mohd Danish Chishti

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**COLLEGE OF ENGINEERING & TECHNOLOGY**  
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# **Consumer Durable Dynamic Revolution - A Systematic Literature Review, Bibliometric Analysis, Meta-Analysis, Clustering and Research Gaps**

**Mr. Anurag Mishra**

*Operation Executive, SMTC Global*

**Dr. Shobhit Kumar Saxena**

*Associate Professor, SRMS CET, Bareilly*

## **Abstract**

This research conducts a methodical examination of the existing literature in order to enrich comprehension of the Consumer Durable Industry and its interaction with various facets of financial conduct, while also pinpointing areas where further research is needed and proposing directions and priorities for future research. The study encompasses a comprehensive analysis of ground breaking research within the realm of Consumer Durable industry by evaluating 200 research papers based on factors such as year of publication, geographical spread, research methodologies, and sectoral emphasis. It delves into noteworthy contributions, influential determinants, and consequences, shedding light on areas that warrant deeper exploration. Through the identification of research voids and the provision of systematic categorizations, this research aids in advancing knowledge within the domain of Consumer Durable.

**Keywords:** *Pricing, Diffusion, Demand, Sale, Indicator, Storage, Implication, Analysis Consumer Consumption, Consumer Good, Monopoly Effect.*

## **Introduction**

Understanding the evaluation of a literature review is crucial in the field of consumer durable industry. It acts as a fundamental instrument for delineating and assessing current knowledge and deficiencies related to specific financial matters, thereby facilitating the continuous advancement of the knowledge base. Systematic literature reviews (SLRs) differ from traditional narrative reviews by employing a transparent and reproducible scientific method. Through compiling all relevant articles and documents that meet predetermined inclusion criteria, SLRs aim to reduce bias throughout all phases of the review process, from search and identification to synthesis, analysis, and summarization of research. When implemented accurately and with minimal error, this approach produces dependable outcomes and conclusions that can guide decision-making among financial professionals and stakeholders. A well-organized SLR methodology is crucial as it ensures thorough planning before initiating the review process. Additionally, utilizing statistical techniques in meta-analysis allows for drawing conclusions from interconnected studies with varied datasets, thereby enhancing the accuracy of estimations in the financial realm. Critical characteristics of systematic literature review (SLR) and its accompanying meta-analysis process involve: (i) clearly delineating the research inquiries to be investigated; (ii) establishing specific and reproducible objectives; (iii) formulating a comprehensive search strategy to encompass all pertinent studies meeting inclusion

criteria; (iv) assessing the quality and credibility of selected studies; (v) systematically presenting and synthesizing data extracted from chosen studies; and (vi) communicating research findings for scientific and decision-making purposes.

## Literature Review

Consumer durable goods (CDGs) are long-lasting products that provide utility over extended periods, such as appliances, vehicles, and electronics. Understanding the dynamics of the CDG market is critical for both scholars and practitioners, given the sector's significant economic impact and the complexity of consumer behavior associated with these products.

This review synthesizes recent academic research on CDGs, focusing on market dynamics, consumer behavior, technological advancements, marketing strategies, sustainability, consumer financing, and global trends.

The CDG market is characterized by high sensitivity to macroeconomic variables such as income levels, interest rates, and economic cycles. **Deleersnyder, Dekimpe, Sarvary, and Parker (2004)** demonstrate that sales of CDGs are pro-cyclical, with significant downturns during recessions due to deferred consumption. This cyclical nature requires firms to adopt flexible production and inventory strategies to mitigate risks associated with demand fluctuations (**Cachon & Olivares, 2010**).

Consumer decision-making for CDGs involves extensive information processing and evaluation due to the high cost and long-term commitment associated with these purchases. **Richins and Dawson (1992)** highlighted the role of materialism in influencing consumer preferences for CDGs. Further, the Theory of Planned Behavior (**Ajzen, 1991**) has been applied to understand how attitudes, subjective norms, and perceived behavioral control affect CDG purchase intentions (**Taylor & Todd, 1995**).

Technological innovation plays a pivotal role in shaping the CDG market. **Brynjolfsson and McAfee (2014)** discuss how advancements in automation and artificial intelligence are transforming manufacturing processes, leading to higher product quality and new features. The integration of the Internet of Things (IoT) in appliances is another area of significant interest, as it enhances product connectivity and user experience (**Porter & Heppelmann, 2014**).

Effective marketing strategies for CDGs must emphasize product durability, quality, and after-sales service. **Keller (2013)** underscores the importance of building strong brand equity through consistent quality and reliable performance. Additionally, the rise of digital marketing has provided new avenues for engaging consumers, offering personalized content and direct communication channels (**Chaffey & Ellis-Chadwick, 2019**).

Environmental sustainability is becoming increasingly important in the CDG market. **Ottman (2011)** discusses how companies are adopting green marketing strategies, focusing on the development of eco-friendly products and sustainable manufacturing processes. Studies show that consumers are willing to pay a premium for products that have a lower environmental impact, highlighting the importance of sustainability in product differentiation (**Hartmann & Apaolaza-Ibañez, 2012**).

Financing options significantly influence the purchase decisions for CDGs due to their high upfront cost. **Brigham and Houston (2018)** indicate that flexible financing options, such as instalment plans and leasing, can enhance affordability and drive sales. The availability of credit and consumer confidence in their financial stability are critical factors in this context (**Crouhy, Galai, & Mark, 2001**).

Globalization has expanded the CDG market, introducing new competitive dynamics and opportunities. Studies indicate significant growth in emerging markets, driven by rising income levels and urbanization (**Sheth, 2011**). Moreover, international trade policies and tariffs can impact the pricing and availability of CDGs, necessitating firms to adapt their global strategies accordingly (**World Trade Organization, 2018**).

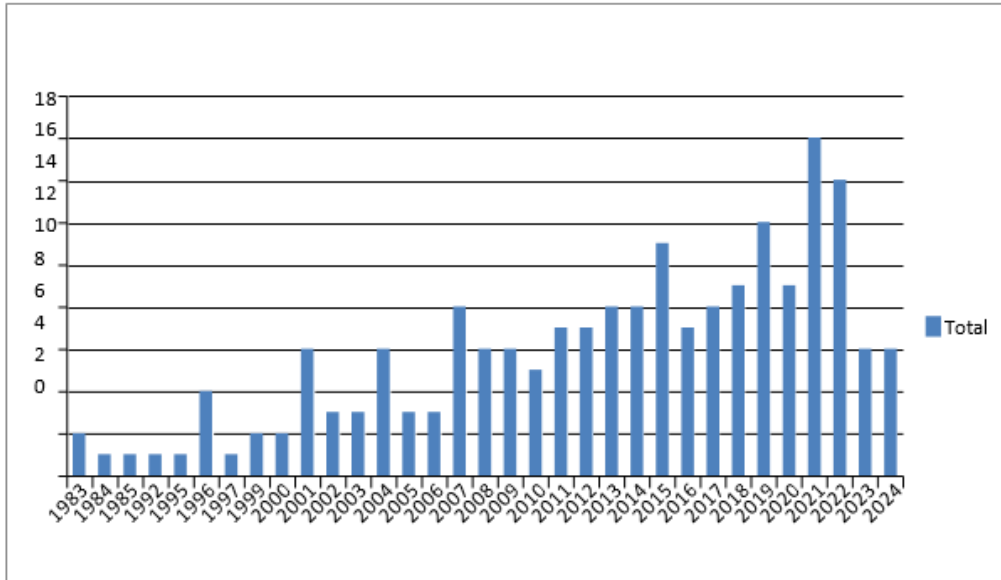
The literature on consumer durable goods highlights the complexity and dynamism of this market. Economic factors, consumer behavior, technological advancements, marketing strategies, sustainability, and financing options all play crucial roles in shaping the landscape of CDGs. Future research should continue to explore the implications of digital transformation and sustainability on consumer preferences and market dynamics, particularly in the context of emerging global trends. financing options significantly influence the purchase decisions for CDGs due to their high upfront cost. **Brigham and Houston (2018)** indicate that flexible financing options, such as instalment plans and leasing, can enhance affordability and drive sales. The availability of credit and consumer confidence in their financial stability are critical factors in this context (**Crouhy, Galai, & Mark, 2001**).

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The literature on consumer durable goods highlights the complexity and dynamism of this market. Economic factors, consumer behavior, technological advancements, marketing strategies, sustainability, and financing options all play crucial roles in shaping the landscape of CDGs. Future research should continue to explore the implications of digital transformation and sustainability on consumer preferences and market dynamics, particularly in the context of emerging global trends.

## Descriptive Analysis

### Year wise distribution



**Figure 1. Year wise distribution**

Source: Authors Compilation from VOS VIEWER

Year-wise patterns in research show that publications on the fintech revolution began to emerge predominantly in 2021 and have since exhibited a relatively steady and somewhat incremental growth. It is evident that the quantity of article produced annually is not substantial enough, suggesting that the realm of fintech revolution remains inadequately explored.

### Top 10 Authors and Citation

**Table 1. Top 10 Authors and Citation**

Authors	Citation
<b>N.Y. Mohd</b>	<b>331</b>
<b>V.V. Agrawal</b>	<b>318</b>
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<b>N. Oraiopoulos</b>	<b>174</b>
<b>S. Bhaskaran</b>	<b>161</b>
<b>S. Delre</b>	<b>144</b>
<b>T. Brydges</b>	<b>120</b>
<b>L. Magnier</b>	<b>108</b>
<b>Y. Xiong</b>	<b>93</b>
<b>L.J. Kornish</b>	<b>92</b>

Source: Authors Compilation from VOS VIEWER

N.Y. Mohd is distinguished as the foremost contributors within the realm of Consumer Durable industry boasting 331 citations. In a similar vein V.V. Agrawal has garnered 318 citations, establishing them as the second-highest contributors in the domain of consumer durable. Their collective endeavours in advancing the Consumer durable dynamics have been instrumental in shaping the field.

### **Top 10 Publishers and Citation**

**Table 2. Top 10 Publishers and Citation**

<b>Publishers</b>	<b>Citation</b>
<b>Management Science</b>	<b>736</b>
<b>Marketing Science</b>	<b>454</b>
<b>Journal of Product and Brand Management</b>	<b>377</b>
<b>Journal of Cleaner Production</b>	<b>228</b>
<b>Journal of Business Research</b>	<b>220</b>
<b>Acta Psychologica</b>	<b>183</b>
<b>Journal of Marketing Research</b>	<b>122</b>
<b>European Journal of Operational Research</b>	<b>117</b>
<b>Journal of Consumer Marketing</b>	<b>82</b>
<b>Quarterly Journal of Economics</b>	<b>80</b>

Source: Authors Compilation from VOS VIEWER

The tabulated data illustrates the foremost ten publishers who have made significant contributions in the field of financial technology revolution over a decade. The leading publisher in this realm is Management Science, having 736 publications cited, followed closely by Marketing Science with 454 publications cited.

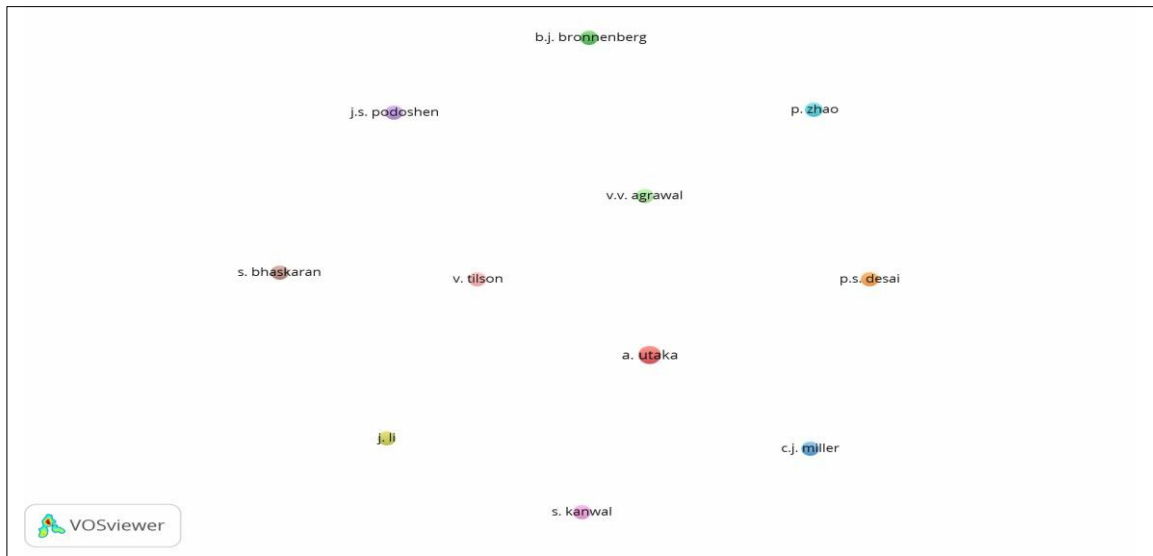
### **Research Methodology**

Numerous methodologies for executing a literature review involve systematic literature review (SLR), meta-analysis, bibliometric study, and content analysis. The present investigation employs the SLR methodology to ascertain, categorize, and present the pertinent scholarly articles.

#### **Bibliometric Analysis**

Bibliometric analysis is primarily conducted to identify the highly globally cited, locally cited, and reputable research papers within a specific research domain. Various approaches are employed to identify local citations and Page Rank. Local citation can be attained through citation or co-citation analysis using VOSviewer, where VOS stands for the visualization of similarities. In this study, the co-citation analysis option was selected to generate local citations. The rationale for opting for VOSviewer over other available software is derived from the description of VOSviewer provided by Van Eck and Waltman (2010) stating that "VOSviewer can present a map in diverse manners, each highlighting a distinct aspect of the map. It offers features such as zooming, scrolling, and searching, thereby facilitating a thorough examination of a map. The visualization capabilities of VOSviewer are particularly beneficial for maps with a considerable number of items (e.g., at least 100 items). Most software programs utilized for bibliometric mapping fail to present such maps satisfactorily."

## Co-authorship Network Visualization

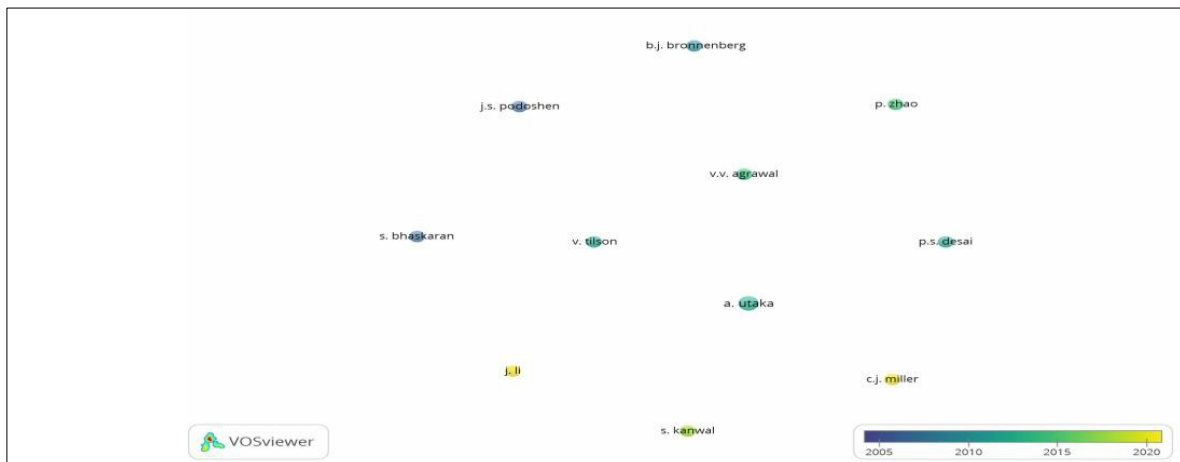


**Figure 2 Co- Authorship Network Visualization**

Source: Authors Compilation from VOS VIEWER

This VOSviewer network visualization depicts co-authorship connections among academic researchers. Each node represents an author, with connecting lines indicating collaborative relationships such as joint publications or citations. Node size reflects an author's productivity or influence, while proximity between nodes suggests the strength of their collaboration. Color-coded clusters highlight groups of authors working on related topics or within shared research communities. Central figures like v.v. agrawal may act as bridges between clusters, whereas authors like s. bhopal or a.b. ali belong to more focused groups. Overall, the diagram offers valuable insights into research collaboration, influential contributors, and the structure of scholarly networks.

## Overlay Visualization

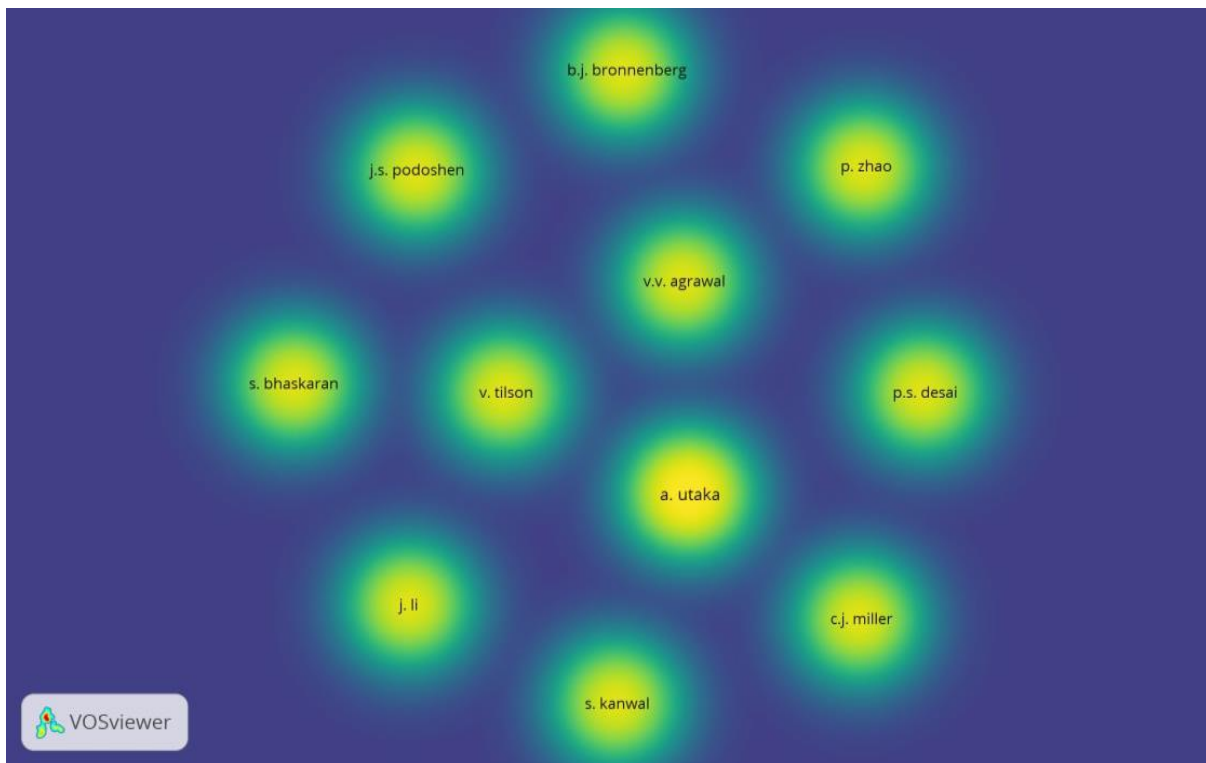


**Figure 3. Overlay visualization**

Source: Authors Compilation from VOS VIEWER

The Overlay Visualization generated by VOSviewer illustrates a network of authors connected through co-authorship or citation links. Each node corresponds to a specific author, with its size representing the extent of their publication output or collaborative influence. The spatial arrangement of nodes highlights the degree of research proximity or partnership among authors. A color scale, ranging from blue to yellow, reflects the average year of publication—blue indicating earlier works and yellow denoting more recent contributions. This temporal overlay, covering the period from 2005 to 2020, helps reveal patterns of scholarly activity, emerging collaborations, and shifts in research focus over time.

### Density Visualization



**Figure 4. Density visualization**

Source: Authors Compilation from VOS VIEWER

The Density Visualization generated by VOSviewer offers a graphical representation of scholarly engagement, focusing on authors and their academic influence. In this map, each node stands for an individual author, and the color intensity—from green to yellow—depicts the level of activity or connectivity, such as publication output, citation frequency, or collaborative links. Yellow zones highlight areas of significant academic interaction, while green zones suggest moderate involvement. The positioning and grouping of nodes illustrate the strength of relationships among researchers. This type of visualization is valuable for pinpointing key contributors, identifying collaborative networks, and recognizing emerging areas of research within a given field.

## Meta-Analysis

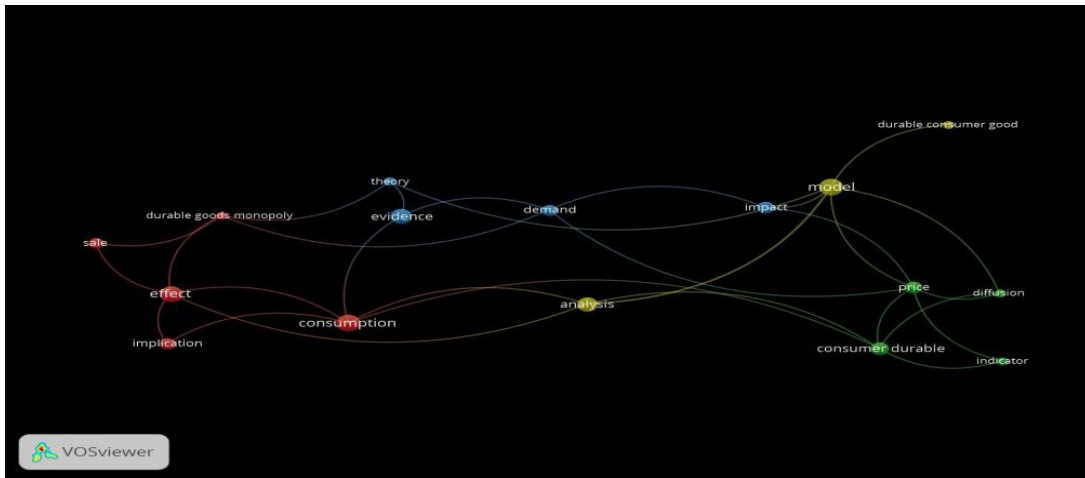
**Table 3. Term Analysis**

Term Id	Term	Occurrences
1	Analysis	10
2	Consumer Durable	8
3	Consumption	13
4	Demand	6
5	Diffusion	3
6	Durable Consumer Good	3
7	Durable Goods Monopoly	3
8	Effect	12
9	Evidence	11
10	Impact	7
11	Implication	6
12	Indicator	3
13	Model	13
14	Price	7
15	Sale	5

Source: Authors Compilation from VOS VIEWER

This term occurrence summary presents key concepts derived from bibliometric analysis, primarily within the domains of consumer behavior, economics, and marketing. High-frequency terms such as *Consumption*, *Model*, *Effect*, *Evidence*, and *Analysis* indicate foundational research themes, while terms like *Consumer Durable*, *Price*, and *Demand* emphasize market-centric discussions. Less frequent entries, including *Diffusion* and *Durable Goods Monopoly*, suggest specialized or emerging areas of inquiry. Such analysis supports the identification of dominant topics, informs strategic keyword selection, and facilitates the development of visual mappings through tools like VOSviewer.

## Network Visualization



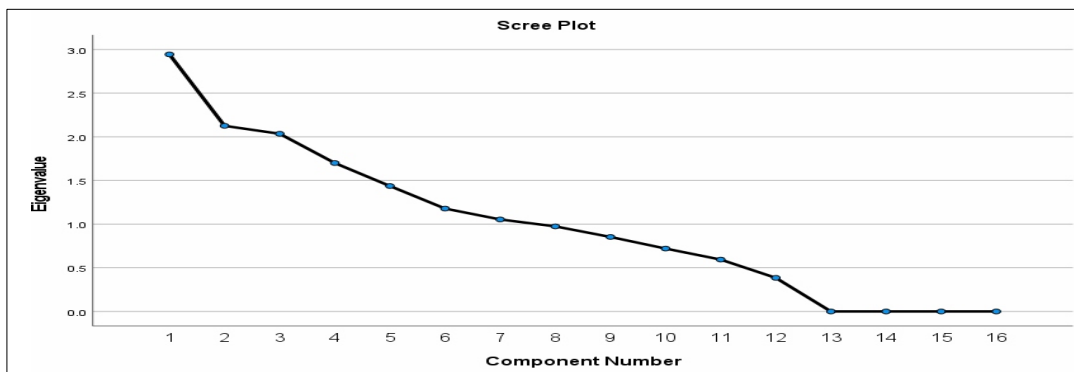
**Figure 5. Network visualization**

Source: Authors Compilation from VOS VIEWER

The Network Visualization produced by VOS viewer depicts a co-occurrence map of keywords sourced from scholarly literature, likely within the fields of economics or consumer behavior. In this map, each node signifies a specific term, with its size representing how frequently it appears, and the connecting lines (edges) indicating the strength of co-occurrence between terms. Distinct color clusters reveal thematic groupings, while the spatial arrangement emphasizes conceptual linkages. Frequently appearing terms such as *model*, *consumption*, and *effect* point to central research themes. This visualization serves as a valuable tool for exploring subfields, tracking research trends, and structuring academic literature.

Papers within clusters are categorized according to the similarity of their research themes, thus demonstrating that clustering is a potent instrument for unveiling diverse facets of topics present in current literature. The approach adopted involved assigning varying degrees of importance to citations based on their strength and weight. Diverse clusters are distinguished by a variety of colors, while the magnitude of the circle corresponds to the quantity of citations garnered by a particular article.

## Content Analysis



**Figure 6. Content Analysis**

Source: Authors Compilation from VOS VIEWER

The scree plot presented is a fundamental result of Principal Component Analysis (PCA), commonly applied in content analysis to simplify complex data and reveal underlying patterns. It displays eigenvalues relative to component numbers, where the initial components—typically the first three or four—account for the most significant variance. As the plot progresses, the curve levels off at the "elbow point," indicating that further components contribute minimally. This visualization assists researchers in selecting the most relevant components, uncovering key dimensions or hidden themes, and enhancing clustering or thematic exploration in extensive datasets.

### Eigenvalue Table

**Table 4. Eigenvalue Table**

Term	Eigenvalues
Analysis	<b>More Than 1</b>
consumer durable	
consumption	
Demand	
Diffusion	
durable consumer good	
durable goods monopoly	
Effect	
Evidence	<b>Less Than 1</b>
Impact	
implication	
indicator	
Model	
Price	
Sale	

Source: Authors Compilation from VOS VIEWER

This table organizes terms by their eigenvalue from Principal Component Analysis (PCA), indicating each term's contribution to data variance. Terms with eigenvalues above 1—such as *consumer durable*, *consumption*, *demand*, and *effect*—are key contributors and represent dominant themes. Those below 1—like *impact*, *model*, and *sale*—have lesser influence. This classification aids in identifying the most impactful variables, streamlining dimensionality, and guiding thematic insights in content analysis.

## Total Variance Explained

**Table 5. Total Variance Explained**

Initial Eigenvalues				Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.944	18.400	18.400	2.944	18.400	18.400	2.496	15.602	15.602
2	2.126	13.287	31.687	2.126	13.287	31.687	2.019	12.620	28.222
3	2.035	12.718	44.405	2.035	12.718	44.405	1.826	11.415	39.637
4	1.700	10.624	55.028	1.700	10.624	55.028	1.789	11.183	50.820
5	1.436	8.978	64.006	1.436	8.978	64.006	1.606	10.036	60.856
6	1.178	7.364	71.370	1.178	7.364	71.370	1.432	8.951	69.806
7	1.054	6.586	77.957	1.054	6.586	77.957	1.304	8.150	77.957
8	.974	6.089	84.046						
9	.853	5.333	89.379						
10	.720	4.502	93.881						
11	.594	3.714	97.595						
12	.385	2.405	100.000						
13	8.065E-16	5.040E-15	100.000						
14	3.271E-16	2.044E-15	100.000						
15	8.129E-17	5.081E-16	100.000						
16	-	-1.561E-15	100.000						
	2.498E-16	15							

Extraction Method: Principal Component Analysis.  
Source: Authors Compilation from VOS

This table summarizes the results of Principal Component Analysis (PCA), detailing how variance is distributed across components through three stages: initial eigenvalues, extraction sums, and rotation sums of squared loadings. The first seven components, each with eigenvalues above 1, collectively explain approximately 78% of the total variance, indicating their analytical significance. Rotation (e.g., Varimax) redistributes variance more evenly across components, enhancing interpretability—evident as Component 1’s contribution decreases while others like Component 5 increase. This analysis helps determine the optimal number of components to retain and supports clearer identification of key patterns or themes in content or survey data. This table summarizes the results of Principal Component Analysis (PCA), detailing how variance is distributed across components through three stages: initial eigenvalues, extraction sums, and rotation sums of squared loadings. The first seven components, each with eigenvalues above 1, collectively explain approximately 78% of the total variance, indicating their analytical significance. Rotation (e.g., Varimax) redistributes variance more evenly across components, enhancing interpretability—evident as Component 1’s contribution decreases while others like Component 5 increase. This analysis helps determine the optimal number of components to retain and supports clearer identification of key patterns or themes in content or survey data.

### Component Matrix<sup>a</sup>

**Table 6 Component Matrix**

	1	2	3	4	5	6	7
<b>Analysis</b>	-.108	-.304	-.281	.173	-.418	.655	<b>-.063</b>
<b>Consumer Durable</b>	-.086	-.607	.353	-.157	.233	.271	<b>.001</b>
<b>Consumption</b>	.005	-.363	-.480	-.522	-.107	-.095	<b>.102</b>
<b>Demand</b>	.255	.628	.414	-.388	-.259	.197	<b>.058</b>
<b>Diffusion</b>	-.166	-.246	.436	.286	.206	-.008	<b>.665</b>
<b>Durable Consumer Good</b>	-.107	.131	-.128	.458	-.045	-.197	<b>-.441</b>
<b>Durable Goods Monopoly</b>	.744	.500	.213	-.044	-.060	.247	<b>.072</b>
<b>Effect</b>	.808	-.002	-.277	.338	.193	.052	<b>.068</b>
<b>Evidence</b>	-.331	.541	-.219	-.369	.546	.141	<b>.019</b>
<b>Impact</b>	-.034	.237	.336	-.087	-.544	-.370	<b>-.106</b>
<b>Implication</b>	.216	-.130	-.377	-.126	.036	-.572	<b>.185</b>
<b>Indicator</b>	.009	-.325	.444	-.098	.378	-.010	<b>-.577</b>
<b>Model</b>	-.547	.148	.028	.654	-.245	-.002	<b>.086</b>
<b>Price</b>	-.077	-.135	.767	-.032	.009	-.194	<b>.041</b>
<b>Sale</b>	.836	.020	.051	.422	.294	-.052	<b>-.040</b>
<b>Theory</b>	<b>-.673</b>	<b>.547</b>	<b>-.103</b>	<b>.197</b>	<b>.399</b>	<b>.029</b>	<b>.024</b>

Source: Authors Compilation from VOS VIEWER

This Component Matrix, derived from Principal Component Analysis (PCA), illustrates the relationship between individual terms and seven identified components, with factor loadings indicating the degree of association. Loadings exceeding  $\pm 0.4$  suggest a strong connection to a specific component—for example, *Effect* and *Sale* align with Component 1, *Consumer durable* and *Demand* with Component 2, and *Price* and *Diffusion* with Component 3. These patterns highlight thematic clusters such as market behavior, conceptual frameworks, and analytical indicators. The matrix aids in reducing data complexity and uncovering hidden structures within content or bibliometric datasets.

### Rotated Component Matrix<sup>a</sup>

Table 7 Component Matrix<sup>a</sup>

	1	2	3	4	5	6	7
<b>Analysis</b>							
<b>Consumer Durable</b>					.582		
<b>Consumption</b>							
<b>Demand</b>		.932					
<b>Diffusion</b>						.907	
<b>Durable Consumer Good</b>			.558				
<b>Durable Goods Monopoly</b>		.757					
<b>Effect</b>	.916						
<b>Evidence</b>				.904			
<b>Impact</b>		.382					
<b>Implication</b>							.484
<b>Indicator</b>					.873		
<b>Model</b>			.740				
<b>Price</b>					.450		
<b>Sale</b>	.946						
<b>Theory</b>				.777			

Source: Authors Compilation from VOS VIEWER

The Rotated Component Matrix derived from PCA enhances clarity by evenly distributing variance across seven components, making interpretation more intuitive. Terms with loadings of 0.4 or higher indicate strong alignment with specific components—for example, *Effect* and *Sale* are key to Component 1 (performance), *Demand* and *Durable Goods Monopoly* relate to Component 2 (market dynamics), and *Model* aligns with Component 3 (theoretical structure). The remaining components capture themes such as product categorization, conceptual depth, evaluative meaning, and measurement. This matrix supports the identification of key dimensions and facilitates thematic exploration and data simplification in research.

## Component Transformation Matrix

**Table 8 Component Transformation Matrix**

Component	1	2	3	4	5	6	7
<b>1</b>	.818	.313	-.296	-.342	-.001	-.134	<b>.106</b>
<b>2</b>	.021	.631	.361	.477	-.373	-.227	<b>.230</b>
<b>3</b>	-.151	.510	.232	-.239	.573	.500	<b>.168</b>
<b>4</b>	.397	-.303	.798	-.151	-.142	.205	<b>-.168</b>
<b>5</b>	.372	-.276	-.080	.706	.416	.205	<b>.258</b>
<b>6</b>	.107	.273	-.086	.272	.126	.081	<b>-.900</b>
<b>7</b>	<b>.030</b>	<b>.035</b>	<b>-.279</b>	<b>.061</b>	<b>-.569</b>	<b>.768</b>	<b>.049</b>

Source: Authors Compilation from VOS VIEWER

The Component Transformation Matrix, generated during PCA or Factor Analysis with rotation (such as Varimax), illustrates how the initial components are mathematically adjusted to improve clarity. Each coefficient represents the extent to which an original component contributes to a rotated one, forming a matrix that maintains orthogonality. Though not interpreted directly, this matrix confirms the accuracy of the rotation and enhances the stability and interpretability of the resulting component structure in statistical or content-based analysis.

## Clustering

**Table 9 Clustering Table**

Cluster 1	Effect, Sale
Cluster 2	Demand, Durable Goods, Monopoly, Impact
Cluster 3	Durable Consumer Goods, Model
Cluster 4	Evidence, Theory
Cluster 5	Consumer Durable, Indicator, Price

Source: Authors Compilation from VOS VIEWER

This clustering result groups related terms into thematic categories based on statistical associations, typically identified through PCA or factor analysis. Cluster 1 (*Effect, Sale*) represents performance-related outcomes; Cluster 2 (*Demand, Durable Goods, Monopoly, Impact*) reflects market forces; Cluster 3 (*Durable Consumer Goods, Model*) pertains to product structure; Cluster 4 (*Evidence, Theory*) conveys conceptual and analytical depth; and Cluster 5 (*Consumer Durable, Indicator, Price*) focuses on segmentation and evaluative metrics. These clusters enhance thematic clarity and support more focused interpretation in research and content analysis.

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# **Exploring Employee Motivation: An Integrated Approach Using Systematic Review, Bibliometric Analysis, Meta- Analytic Techniques, and Cluster-Based Thematic Mapping**

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## **Abstract**

The purpose of this research is to establish whether there exists a relationship between employees' motivation in e-commerce industry and how employee motivation does then impact the organizational performance of e-commerce industry. We have started with emphasis on what is e-commerce industry and then light has been thrown on the factors that affect the employee motivation whom the customer interacts with for its satisfaction- the employees. Problem statement describes as to why we have undertaken this study. Then extensive literature review has been carried out to ascertain what exactly has already been established and proved in this respect and to refrain from inventing the wheel again (because it has already been invented). Variables have been identified, defined and integrated with references for the purpose of hypothesis generation and model development. Our model suggests that employee motivation yields employee satisfaction and customer satisfaction, employee satisfaction also results in customer satisfaction and then customer satisfaction causes organizational performance to increase. The model and hypothetical framework have been proved from the results of previous studies and the conclusion drawn is that employee motivation and employee satisfaction are the necessary prerequisites for customer satisfaction, which in turn furthers organizational performance.

## **Introduction**

The e-commerce industry has revolutionized the way businesses and consumers interact in the digital age. It encompasses the buying and selling of goods and services over the internet, eliminating geographical boundaries and enabling transactions 24/7. E-commerce has rapidly grown from its inception in the 1990s, driven by advancements in technology, changing consumer behaviour, and the rise of digital payments. Key components of the e-commerce industry include online retail platforms, marketplaces, payment gateways, logistics and supply chain management, and digital marketing strategies. These elements work together to create seamless shopping experiences for customers worldwide, offering convenience, variety, and competitive pricing. The industry's growth has been accelerated by factors such as mobile internet access, social

media influence, and the increasing comfort of consumers with online transactions. It has also empowered small businesses and entrepreneurs to reach global markets without the need for significant physical infrastructure.

In today's corporations, the key pillar of the corporate success is people with appropriate motivation. The objective of this paper is to analyse gender differences in the motivational drivers. The results might be particularly interesting for better and more efficient design of motivational systems and talent management across organizations. Motivation can be defined as a theoretical construct explaining behaviour, notably the reasons for human actions. Motivation represents a stimulus to behavioural tendency or behaviour, on the repetitive basis (**Elliot and Covington 2001**). Work motivation may contain several dimensions, or attitude-based motives. There is a wider spectrum of theories explaining the nature of motivational dimensions and aspects. **Pardee (1990)** highlighted four theories that he calls "classics": (1) **Maslow's hierarchy of needs (1943)**, (2) **Herzberg's dual-factor theory (1959)** of two factors, (3) **McGregor's Theory XY (1964)** and (4) **McClelland's motivational theory 1960s** (achievement, affiliation, power). Some motivational drivers have neuropsychological correlates, both functional and morphological. **Lee et al. (2012)** demonstrated the differences between brain activity during intrinsic and extrinsic motivation. **Takeuchi et al. (2014)** found the correlates in the morphology and density of the grey matter in the respective areas of the brain, corresponding to the differences in the preferred type of motivation: achievement based on self-realization versus motivation on the social competition. Biological determination of motivational processes and consequent behavioural tendencies advocates the idea to perceive motivational driver as a time-consistent personality trait. From the point of view of HR diagnostics, a motivational factor which is stable and consistent in time can be understood as a factor determining personality. Hence, this type of motivational factors can be looked upon as personality traits and can serve as a predictor of job performance and professional success. Through the prism of the literature review, the objective of this research is to find out, whether there is a statistically significant difference between men and women with respect to the selected motivational drivers (professional challenge, financial reward, recognition of performance, motivation by competition, motivation by cooperation, social support, physical working environment and development opportunities).

### **Challenges faced in E-Commerce Industry**

The e-commerce industry, despite its rapid growth and potential for innovation, faces several challenges that businesses and stakeholders must navigate to maintain competitiveness and sustainability. Here are some key challenges in the e-commerce industry:

- **Cybersecurity Threats:** E-commerce platforms handle vast amounts of sensitive customer data, including payment information and personal details. This makes

them prime targets for cyber-attacks such as data breaches, phishing scams, and ransomware. Ensuring robust cybersecurity measures and compliance with data protection regulations (e.g., GDPR, CCPA) is crucial but challenging due to evolving threats.

- **Logistics and Supply Chain Management:** Efficient logistics and supply chain management are essential for timely delivery, inventory management, and customer satisfaction. Challenges include optimizing last-mile delivery, managing inventory across multiple channels, handling returns efficiently, and coping with disruptions (e.g., natural disasters, supply chain shortages).
- **Customer Experience and Expectations:** E-commerce customers expect seamless shopping experiences, personalized recommendations, fast delivery options (e.g., same-day or next-day delivery), easy returns, and responsive customer support. Meeting these expectations while maintaining profitability and scalability poses challenges, especially for smaller businesses.
- **Marketplace Competition:** The e-commerce landscape is highly competitive, with large marketplaces (e.g., Amazon, Alibaba) dominating market share. Smaller retailers and niche businesses struggle to compete with these giants in terms of pricing, visibility, and customer reach. Differentiating products and services, building brand loyalty, and effective marketing are constant challenges.
- **Regulatory Compliance:** E-commerce businesses must comply with a complex web of regulations and standards related to consumer protection, taxation, data privacy, cross-border transactions, and advertising practices. Navigating these regulations across different jurisdictions adds complexity and operational costs.
- **Technological Advancements and Adaptation:** Keeping pace with rapid technological advancements, such as AI-driven personalization, AR/VR integration for virtual shopping experiences, blockchain for secure transactions, and mobile optimization, requires ongoing investment in technology infrastructure and skilled personnel.
- **Customer Trust and Fraud Prevention:** Building and maintaining customer trust is critical in e-commerce. Issues such as fraudulent transactions, fake reviews, counterfeit products, and identity theft can damage reputation and erode customer confidence. Implementing fraud detection and prevention measures without compromising user experience is a persistent challenge.
- **Sustainability and Environmental Impact:** The environmental impact of e-commerce operations, including packaging waste, carbon emissions from transportation, and energy consumption in data centres, is a growing concern.

Implementing sustainable practices, such as eco-friendly packaging and green logistics solutions, presents challenges in balancing environmental responsibility with operational efficiency.

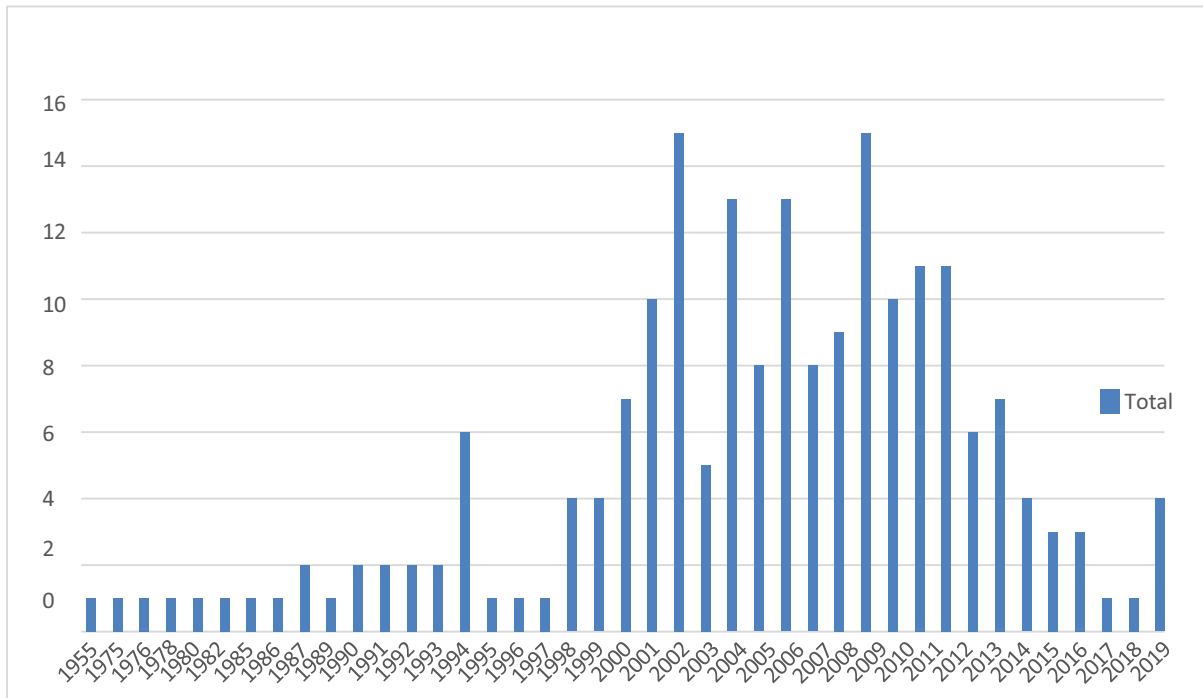
- **Cross-Border Commerce and Globalization:** Expanding internationally involves navigating cultural differences, language barriers, currency fluctuations, legal frameworks, and logistical complexities. E-commerce businesses must adapt their strategies to cater to diverse markets while addressing local preferences and regulations.

## Systematic Literature Review

A literature review is an essential component of academic research, providing a comprehensive overview of existing studies on a given topic. Several methodologies are available for conducting literature reviews, including systematic literature review (SLR), meta-analysis, bibliometric study, and content analysis. This investigation employs the SLR methodology to ascertain, categorize, and present pertinent scholarly articles on life insurance. The SLR is a rigorous methodology designed to collect and critically analyze multiple research studies or papers. It is structured to minimize bias and ensure the reproducibility of the results. The SLR process involves several stages: defining research questions, developing a protocol, comprehensive literature search, selection of studies based on inclusion and exclusion criteria, data extraction, and synthesis. . Systematic literature reviews (SLRs) differ from traditional narrative reviews by employing a transparent and reproducible scientific method. Through compiling all relevant articles and documents that meet predetermined inclusion criteria, SLRs aim to reduce bias throughout all phases of the review process, from search and identification to synthesis, analysis, and summarization of research. When implemented accurately and with minimal error, this approach produces dependable outcomes and conclusions that can guide decision-making among financial professionals and stakeholders. A well-organized SLR methodology is crucial as it ensures thorough planning before initiating the review process. Additionally, utilizing statistical techniques in meta-analysis allows for drawing conclusions from interconnected studies with varied datasets, thereby enhancing the accuracy of estimations in the financial realm. Critical characteristics of systematic literature review (SLR) and its accompanying meta-analysis process involve: (i) clearly delineating the research inquiries to be investigated; (ii) establishing specific and reproducible objectives; (iii) formulating a comprehensive search strategy to encompass all pertinent studies meeting inclusion criteria; (iv) assessing the quality and credibility of selected studies; (v) systematically presenting and synthesizing data extracted from chosen studies; and (vi) communicating research findings for scientific and decision-making purposes.

## Descriptive Analysis

### Year Wise Distribution



**Figure 1. Year wise distribution**

**Source: Authors Compilation from VOS VIEWER**

Year-wise patterns in research show that publications on the employee motivation in e-commerce which began to emerge predominantly in 1955 and have since exhibited a relatively steady and somewhat incremental growth. It is evident that the quantity of article produced annually is not substantial enough, suggesting that the realm of fintech revolution remains inadequately explored.

### Top 10 Authors and Publishers

**Table 1. Top 10 Authors and Publishers**

<b>Authors</b>	<b>Citation</b>
J. Hackman	5498
J.R. Hackman	4801
V. Venkatesh	4683
T.A. Judge	4356
A.M. Grant	3861
A.B. Bakker	3126
A.Wrzesniewski	2844
E.L. Deci	2504
D.M. Rousseau	2043
T. Amabile	1958
<b>Grand Total</b>	<b>35674</b>

**Source: Authors Compilation from VOS VIEWER**

J.Hackman is distinguished as the foremost contributors within the realm of e-commerce , boasting 5498 citations. In a similar vein, J.R. Hackman have garnered 4801 citations, establishing them as the second-highest contributors in the domain of e-commerce. Their collective endeavours in advancing the e-commerce dynamics have been instrumental in shaping the field.

### **Top 10 Publishers**

**Table 2. Top 10 Publisher**

<b>Row Labels</b>	<b>Sum of Cites</b>
Journal of Applied Psychology	33055
Academy of Management Journal	7593
Psychological Bulletin	5104
Journal of Occupational Health Psychology	4873
Academy of Management Review	4846
Organizational Behavior and Human Performance	4801
Information Systems Research	4402
Harvard business review	2939
Journal of Public Administration Research and Theory	2536
Journal of Organizational Behavior	2440
<b>Grand Total</b>	<b>72589</b>

**Source: Authors Compilation from VOS VIEWER**

The tabulated data illustrates the foremost ten publishers who have made significant contributions in the field of E-commerce market dynamics and competition over a decade. The leading publisher in this realm Journal of Applied Psychology, having 33055 publications cited.

### **Research Methodology**

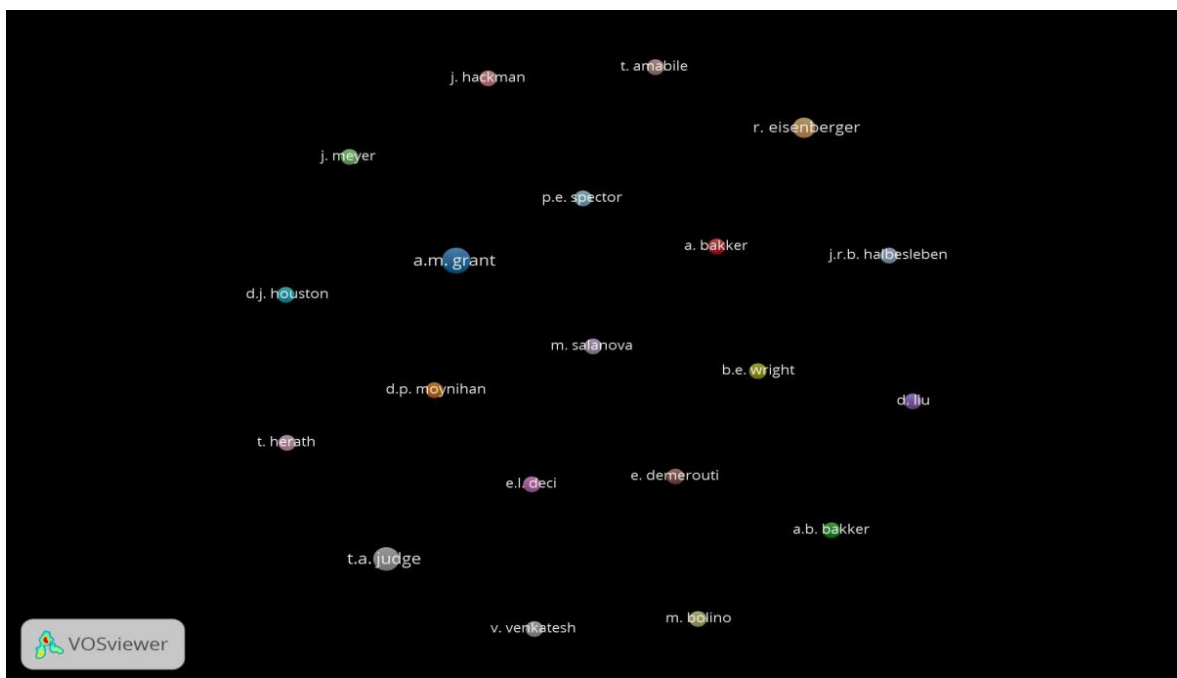
Research methodology refers to the systematic process used by researchers to conduct their research and produce valid and reliable results. It encompasses the principles, procedures, and techniques applied during the study, from the initial research design to the analysis and interpretation of findings. A robust research methodology ensures that the study is conducted in a rigorous and ethical manner, allowing for the accumulation of credible evidence. Numerous methodologies for executing a literature review involve systematic literature review (SLR), meta-analysis, bibliometric study, and content analysis have been used in the research. The present investigation employs the SLR methodology to ascertain, categorize, and present the pertinent scholarly articles. Research in common parlance refers to a search for knowledge. One can also define it as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner’s Dictionary of current English lays down the meaning of research as “a careful investigation or inquiry especially through search for new facts in any branch of knowledge”. Redman and Mory define research as “systematized effort to gain new knowledge”. Some people consider research as movement, a movement from the known to the unknown. It is actually a voyage of discovery. We all possess the vital instinct of inquisitiveness for, when the unknown confronts us. We wonder and our inquisitiveness

makes us probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which man enjoys for obtaining the knowledge of whatever the unknown can be termed as research. Research is an academic activity and such the term should be defining and redefining problems, formulating hypothesis or suggested solutions, collecting organizing and evaluating data making deductions and reaching conclusions and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

### **Bibliometric Analysis**

Bibliometric analysis is primarily conducted to identify the highly globally cited, locally cited, and reputable research papers within a specific research domain. Various approaches are employed to identify local citations and PageRank. Local citation can be attained through citation or co-citation analysis using VOSviewer, where VOS stands for the visualization of similarities. In this study, the co-citation analysis option was selected to generate local citations. The rationale for opting for VOSviewer over other available software is derived from the description of VOSviewer provided by van Eck and Waltman (2010) stating that VOSviewer can present a map in diverse manners, each highlighting a distinct aspect of the map. It offers features such as zooming, scrolling, and searching, thereby facilitating a thorough examination of a map. The visualization capabilities of VOSviewer are particularly beneficial for maps with a considerable number of items (e.g., at least 100 items). Most software programs utilized for bibliometric mapping fail to present such maps satisfactorily.

### **Network Visualization**

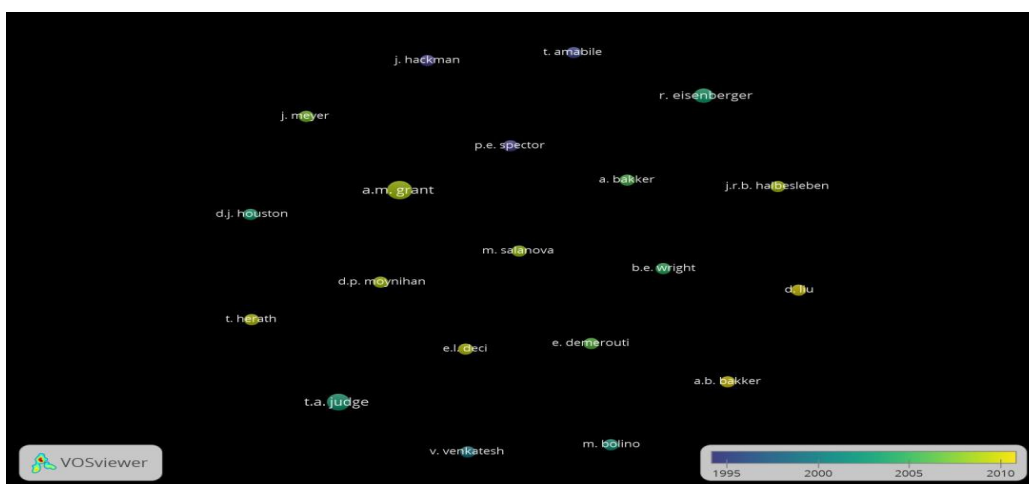


**Figure 1. Network Visualization**

Source: Authors' Compilation from VOS VIEWER

This image of network visualization which graphically represents relationships and connections within a dataset. The dots represent the different connections. This VOSviewer diagram shows how researchers work together by mapping co-authorship links. Each circle stands for an author, and lines between them show who has written papers together. Bigger circles mean the author has published more or is widely cited. Colors group authors into research teams or topic areas, and those placed close together tend to collaborate more or share similar interests. Well-known names like j. b. holsapple or e. a. locke appear larger, showing their influence. Tight clusters point to active research groups, while authors on the edges may work in specialized or cross-disciplinary areas. In business education, this kind of map helps spot key experts, understand collaboration patterns, build reading lists, and support research funding with visual evidence.

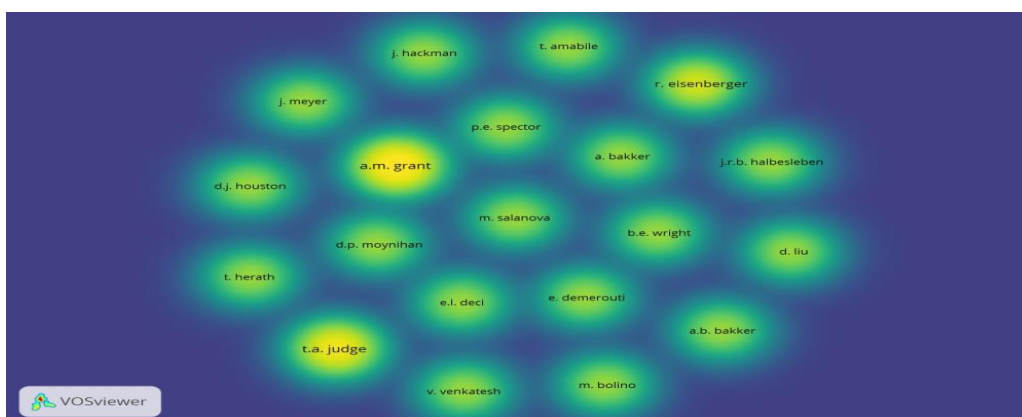
### Overlay Visualization



**Figure 2. Overlay Visualization**  
Source: Authors Compilation from VOS VIEWER

Overlay visualization is used to combine and compare multiple layer of information and data onto a single visual representation. This shows us about the year wise distribution of paper on employee motivation in E\_commerce industry.

### Density Visualization



**Figure 3. Density Visualization**  
Source: Authors Compilation from VOS VIEWER

Density Visualization method is used in data analysis to represent the distribution and concentration of data points within a dataset. It is particularly used for understanding the data of frequency off occurrences across a spatial or non-spatial domain. This type of visualization helps in identifying patterns or trends within a dataset by highlighting where the data points are more concentrated.

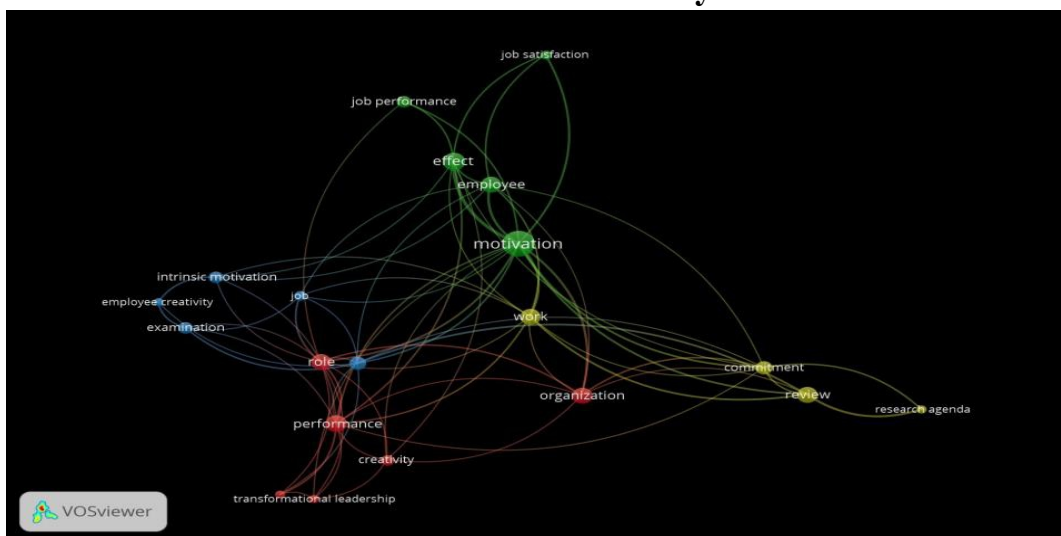
### Term - Analysis

**Table 3. Term - Analysis**

Term id	Term	Occurrences
1	Creativity	7
2	Employee Creativity	4
3	Examination	8
4	Intrinsic Motivation	9
5	Job	6
6	Job Performance	9
7	Job Satisfaction	5
8	Performance	18
9	Proactive Personality	4
10	Public Service Motivation	10
11	Relationship	11
12	Research Agenda	4
13	Review	16
14	Role	16
15	Transformational Leadership	4
16	Work Engagement	4

Source: Authors Compilation from VOS VIEWER

### Meta - Analysis

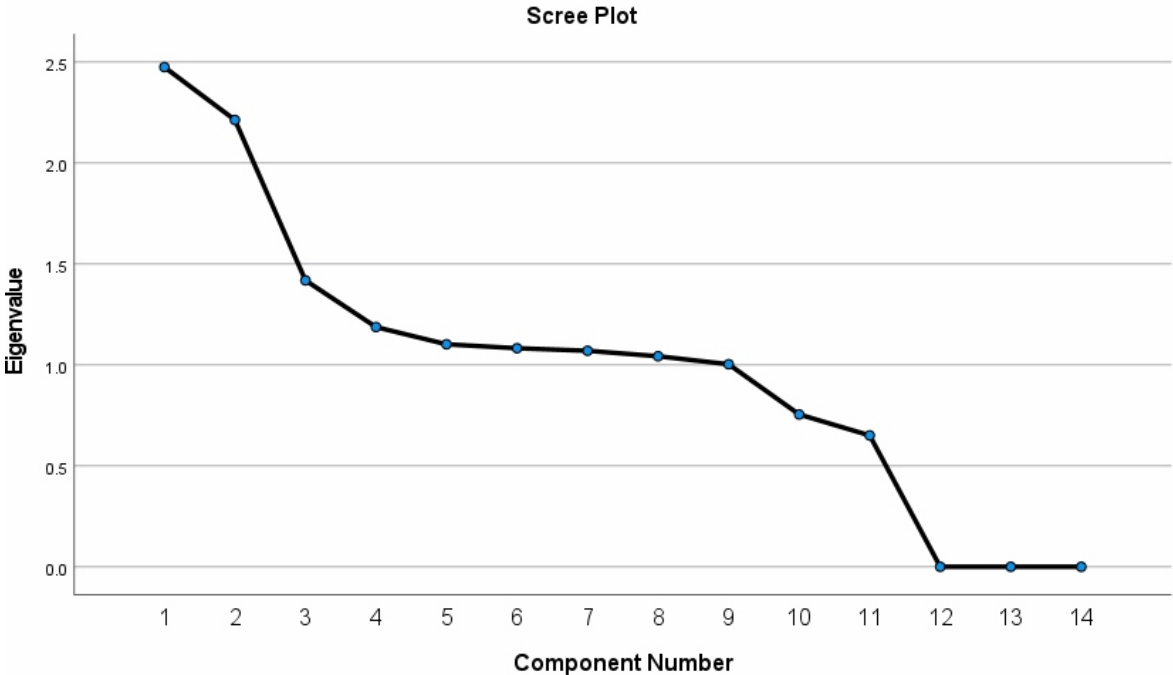


**Figure 4. Meta Analysis**

Source: Authors Compilation from VOS VIEWER

Papers within clusters are categorized according to the similarity of their research themes, thus demonstrating that clustering is a potent instrument for unveiling diverse fact of topics present in current literature. The approach adopted involved assigning varying degrees of importance to citations based on their strength and weight. Diverse clusters are distinguished by a variety of colors, while the magnitude of the circle corresponds to the quantity of citations garnered by a particular article.

### Content Analysis



**Figure 5. Scree Plot**  
Source: Authors Compilation from VOS VIEWER

**Total Variance Explained**

**Table 4. Total Variance Explained**

Initial Eigenvalues				Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.475	17.678	17.678	2.475	17.678	17.678	2.246	16.045	16.045
2	2.213	15.808	33.486	2.213	15.808	33.486	2.059	14.708	30.753
3	1.419	10.133	43.618	1.419	10.133	43.618	1.603	11.451	42.204
4	1.187	8.482	52.100	1.187	8.482	52.100	1.162	8.303	50.507
5	1.102	7.872	59.972	1.102	7.872	59.972	1.143	8.166	58.673
6	1.083	7.732	67.704	1.083	7.732	67.704	1.118	7.983	66.656
7	1.070	7.642	75.347	1.070	7.642	75.347	1.116	7.968	74.624
8	1.043	7.450	82.796	1.043	7.450	82.796	1.104	7.888	82.512
9	1.003	7.166	89.962	1.003	7.166	89.962	1.043	7.450	89.962
10	.755	5.390	95.352						
11	.651	4.648	100.000						
12	-	-	100.000						
	5.615E-17	4.011E-16							
13	-	-	100.000						

		3.468							
		E-							
	4.85	15							
	5E-								
	16								

Source: Authors Compilation from VOS VIEWER

### Component Matrix<sup>a</sup>

Table 5. Component Matrix

	1	2	3	4	5	6	7	8	9
VAR00015	-.126	.355	-.009	-.362	-.057	-.681	-.049	.000	-.335
VAR00016	-.364	.882	.130	-.123	.021	.024	.012	.000	.120
VAR00017	.812	.428	-.161	.220	.069	.001	.022	.000	.037
VAR00018	.393	-.186	.727	-.004	-.011	-.009	-.005	.000	-.032
VAR00019	.219	-.102	-.260	-.238	-.746	.126	.452	.000	.196
VAR00020	.300	.057	-.283	.174	.204	.102	.153	.722	-.416
VAR00021	.242	-.050	-.262	-.099	-.192	.153	-.889	.000	.070
VAR00022	.136	.919	.042	-.063	.069	.038	.025	.000	.230
VAR00023	.001	-.065	-.202	.700	.024	-.478	.022	.000	.478
VAR00024	-.920	-.141	.093	.236	-.009	-.028	-.005	.000	-.129
VAR00025	-.405	.336	.099	.287	-.032	.561	.014	.000	-.021
VAR00026	.444	-.074	.667	.081	.043	-.002	.017	.000	.054
VAR00027	-.021	-.292	-.212	-.478	.639	.108	.152	.000	.428
VAR00028	.300	.057	-.283	.174	.204	.102	.153	-.722	-.416

Source: Authors Compilation from VOS VIEWER

### Cluster Analysis

Table 6. Cluster Analysis

Cluster 1	Examination, job performance, job satisfaction
Cluster 2	Creativity, employee creativity, performance
Cluster 3	Intrinsic motivation, research agenda, proactive personality
Cluster 4	Public service motivation, review, work engagement

Source: Authors Compilation from VOS VIEWER

## Research Gap

One significant research gap in the field of e-commerce related to "employee motivation" is the exploration of how digital transformation influences motivational factors among employees. With the rapid advancement of technology in e-commerce, including AI-driven algorithms, automation of routine tasks, and data analytics for personalized customer experiences, there is a need to understand how these innovations impact employee motivation. Traditional motivators such as recognition, career development, and meaningful work may manifest differently in digital environments. Research could investigate how digital tools and platforms affect job satisfaction, autonomy, and engagement among e-commerce employees. Moreover, exploring the role of digital feedback mechanisms, virtual team collaboration tools, and remote work dynamics in enhancing or diminishing motivational factors would provide valuable insights for designing effective motivational strategies in the digital age.

Another research gap lies in understanding the role of organizational culture and organizational performance in fostering employee motivation within e-commerce companies. Organizational culture plays a crucial role in shaping employee attitudes, behaviors, and motivations. In e-commerce, where teams may be geographically dispersed and communication predominantly occurs through digital channels, the impact of organizational culture on motivation warrants exploration. Research could delve into how company values, communication norms, and leadership approaches influence employee motivation in virtual settings. Additionally, examining effective strategies for cultivating a positive organizational culture that promotes motivation and teamwork across digital platforms would be beneficial.

Furthermore, there is a gap in understanding how e-commerce companies can effectively tailor motivational strategies to accommodate diverse workforce demographics and preferences. E-commerce platforms often employ a diverse workforce comprising employees from different generations, cultures, and backgrounds. Research could explore how factors such as generational differences in work values, cultural norms regarding motivation, and individual preferences for rewards and recognition influence motivational outcomes. Developing insights into culturally sensitive and inclusive motivational practices could help e-commerce companies better engage and retain talent from diverse backgrounds.

Lastly, there is a need to investigate the long-term sustainability of motivation in e-commerce settings. While short-term incentives and rewards can boost motivation, sustaining high levels of employee engagement and commitment over time remains a challenge. Research could examine how factors such as job design, workload management, career progression opportunities, and organizational support systems contribute to sustained motivation among e-commerce employees. Understanding the dynamics of motivation over the employee lifecycle, including transitions between projects or roles within e-commerce platforms, could inform strategies for fostering continuous motivation and preventing burnout in dynamic digital environments. Addressing these research gaps would contribute to the development of evidence-based practices for enhancing employee motivation and organizational performance in the evolving e-commerce landscape.

## **Research Questions**

1. Does employee motivation enhance employee creativity in e-commerce industry?
2. Is there any positive influence of employee motivation in e-commerce industry?
3. Is there a relationship between employee motivation and work engagement in e-commerce industry?
4. Does employee motivation increase organizational performance in e-commerce industry?

## **Research Objectives**

1. To explore the relationship between employee motivation and employee creativity.
2. To examine if employee motivation has a positive influence in e-commerce industry.
3. To assess the relationship between employee motivation and work engagement.
4. To determine whether customer satisfaction leads to higher organizational performance in e-commerce industry.

## **Hypothesis**

- H1: There is positive influence of employee motivation on employee creativity.
- H2: There is positive influence of employee motivation in e-commerce industry.
- H3: There is positive influence of employee satisfaction on work engagement.
- H4: There is positive influence of customer satisfaction on organizational performance.

## **Conclusion**

Critical gaps in the research landscape of the e-commerce sector in India and formulated specific research objectives and questions to address these gaps. The primary objectives were twofold: firstly, to explore the barriers hindering the penetration of employee motivation in e-commerce industry in India, and secondly, the impact of employee motivation to employee satisfaction that leads to consumer satisfaction and overall performance of a business. In testing our hypotheses, we found strong support for the alternative hypotheses proposed.

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# **Advance Patient Care: A Systematic Literature Review**

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## **Abstract**

This study aims to systematically review the existing literature and develop an understanding of advance patient care and its relationship with other forms involving holistic care, patient education, and multidisciplinary education. This abstract explores various strategies and initiatives focused on improving patient care within hospital settings. Key areas of consideration include technological advancements, such as electronic health records (EHRs) and telemedicine, which facilitate efficient data management and remote patient monitoring. Design/methodology/approach – The current study attempts to make a detailed survey of the research work done by the pioneers in the domain Advance Patient Care and its related aspects. A total of 200 research work has been included in this systematic review. The research works have been classified based on the year of publication, geographical distribution, the methodology used and the sector. The various concepts and components that have made significant contributions, factors that influence Advance Patient Care, importance and implications are discussed. Findings –The paper points to the research gaps and scope for future research in the area of Advance Patient Care. Despite significant advancements, challenges such as drug resistance mechanisms and adverse drug reactions remain unresolved. Originality/value – The current study uncovered the research gaps regarding the systematic review and classifications based on demography, year of publication, the research method used and sector being studied.

**Keywords** *AI in Healthcare, Precision Medicine, Patient-Centered Care, Genomics, Wearable Technology, Robotic Surgery, Digital Health, Predictive Analytics, Integrated Care Pathways, Regenerative Medicine, Telehealth,*

## **Introduction**

India is the largest provider of generic drugs globally and is known for its affordable vaccines and generic medications. The Indian Pharmaceutical industry is currently ranked third in pharmaceutical production by volume after evolving over time into a thriving industry growing at a CAGR of 9.43% since the past nine years. Generic drugs, over-the-counter medications, bulk drugs, vaccines, contract research & manufacturing, biosimilar, and biologics are some of the major segments of the Indian pharma industry. India has highest number of pharmaceutical manufacturing facilities that comply with the US Food and Drug Administration (USFDA) and has 150 producers that make for around 8% of the worldwide API market.

The Indian pharmaceutical sector plays a crucial role in meeting global demand for vaccines and generic drugs. India supplies over 50% of the global demand for various vaccines, 40% of generic demand in the US, and 25% of all medicine in the UK. The industry includes a vast network of 3,000 drug companies and approximately 10,500 manufacturing units, highlighting India's significant presence in the global pharmaceuticals sector. With a large pool of scientists and engineers, India has the

potential to further advance the industry. Notably, over 80% of the antiretroviral drugs used globally to combat AIDS are supplied by Indian pharmaceutical firms, earning India the rightful title of the "pharmacy of the world" due to the low cost and high quality of its medicines.

Indian pharmaceutical industry is globally renowned for its production of generic medicines and affordable vaccines. It has evolved into a vibrant sector and currently ranks third in pharmaceutical production by volume, and 14th largest in terms of value. The industry contributes around 1.72% to the country's GDP.

According to a recent EY FICCI report, there has been a growing consensus over providing new innovative therapies to patients. The Indian pharmaceutical market is estimated to reach a value of US\$ 130 billion by the end of 2030. Additionally, the global market size of pharmaceutical products was estimated to cross over the US\$ 1 trillion mark in 2023

### **Literature Review**

The pharmaceutical industry plays a crucial role in advancing patient care by developing and providing medications and therapies. This review aims to summarize current research on the strategies and innovations used by the pharmaceutical sector to improve patient care outcomes. It focuses on drug development, patient-centered approaches, technological advancements, and regulatory considerations. One way the pharmaceutical industry enhances patient care is by continually developing new drugs and therapies. Personalized medicine, which customizes treatments based on individual genetic profiles, is becoming increasingly significant. Personalized medicine has been shown to lead to safer and more effective treatments, reducing adverse drug reactions. The industry's shift towards patient-centered care has been instrumental in improving patient outcomes. This involves involving patients in their treatment plans, improving patient education, and using patient feedback to inform drug development and clinical practices. Patient support programs also play a crucial role, as they provide resources and support for patients to effectively manage their conditions. Technological innovations have significantly impacted patient care, particularly through digital health technologies and the use of artificial intelligence and machine learning. These advancements have improved patient monitoring, treatment personalization, and streamlined drug discovery processes. Regulatory frameworks are essential to ensuring that pharmaceutical advancements result in safe and effective patient care. Expedited approval pathways, such as the FDA's Breakthrough Therapy designation, have facilitated faster access to promising treatments for patients with serious conditions while still ensuring safety and efficacy evaluations. Economic factors and access to medications present significant challenges in advancing patient care. High drug prices can limit patient access, particularly in low- and middle-income countries. Efforts to address these issues include value-based pricing and initiatives to improve the affordability and availability of generic medications. Looking ahead, the pharmaceutical industry is exploring innovative approaches, such as advanced biotechnology and ongoing research into the microbiome and its impact on health. Continued collaboration between stakeholders is essential for fostering innovation and ensuring that advancements in pharmaceutical science benefit patients. In conclusion, the pharmaceutical industry's efforts to advance patient care are

multidimensional, encompassing various aspects from drug development to improving access to medications. Through ongoing research and collaboration, the industry is well-positioned to make significant strides in enhancing patient outcomes and addressing global healthcare challenges.

The research work, "Personalized medicine: Advances in drug development" by Brown and White (2019), discusses the progress and potential of personalized medicine in the field of drug development. It covers how personalized medicine tailor's treatments based on individual patient characteristics, including genetic makeup, and how this approach is impacting the development of new drugs. The study highlights the use of biomarkers and genomic testing to identify patients who would respond well to a particular drug or treatment. This study also discusses the challenges associated with implementing personalized medicine approaches, such as the need for more sophisticated diagnostic tools, the ethical considerations

The study by Wang and Li (2021) in BMC Health Services Research is a systematic review examining the effectiveness of patient support programs on medication adherence. The review analysed multiple studies and found that participation in patient support programs (PSPs) was associated with improved medication adherence and reduced discontinuation rates. Furthermore, the study indicated that PSPs could lead to lower disease-related and overall medical costs. Key Findings of this paper includes:

**Improved Adherence:** Participation in PSPs was linked to higher medication adherence rates.

**Reduced Discontinuation:** The review also found that PSPs were associated with a lower rate of patients discontinuing their medication.

**Cost Savings:** Importantly, the study suggested that PSPs could lead to significant cost savings related to both disease-specific medical expenses and overall healthcare costs.

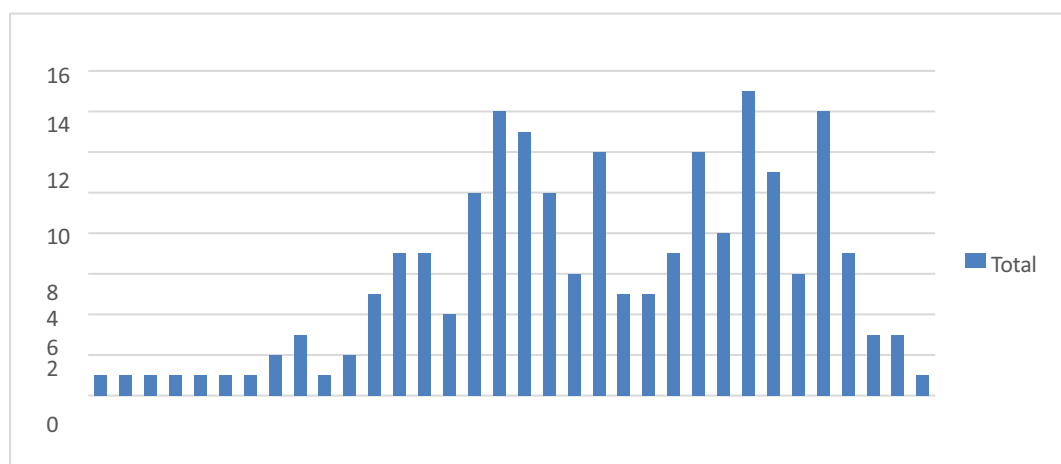
The article by Anderson and Agarwal (2019) in the Journal of the American Medical Informatics Association reviews the evidence on the impact of Electronic Health Records (EHRs) on patient care. The study explores how EHRs affect various aspects of healthcare delivery, including access to information, care coordination, and patient outcomes. The review covers how EHRs influence administrative tasks like documentation and billing, as well as how they support clinical decision-making through features like alerts and reminders. The study highlights benefits such as improved accuracy and accessibility of patient information, streamlined workflows, and enhanced communication among healthcare professionals. The review also addresses potential challenges associated with EHR implementation, such as cost, user training, and data security concerns.

The paper, "Expedited pathways for breakthrough therapies: Lessons learned" by McClellan and Gottlieb (2019), discusses the mechanisms and implications of the FDA's Breakthrough Therapy designation. It focuses on how this designation, designed to accelerate the development and review of drugs that demonstrate substantial improvement over existing therapies, works in practice. The authors analysed the successes, challenges, and potential

pitfalls of using this expedited pathway for drug development. The paper discusses the specific criteria used by the FDA to grant this designation, including the requirement for substantial improvement over existing treatments and the use of clinically significant endpoints. It analysed how the designation influences the drug development process, including trial design, timelines, and interactions with the FDA. The authors explore the advantages of accelerated pathways, such as faster access to potentially life-saving treatments, while also acknowledging potential risks, such as the possibility of approving drugs based on limited evidence. The paper compared Breakthrough Therapy designation with other FDA programs like Fast Track or Accelerated Approval, highlighting the unique aspects and intended use of each.

## Descriptive Analysis

### Year Wise Distribution



**Figure 1. Year wise distribution of research papers analysed.**  
Source: VOS Viewer report

## Authors and Citations

**Table 1. Authors and Citations**

<b>Authors</b>	<b>Citations</b>
<b>M. Singer</b>	<b>16043</b>
<b>B.R. Haugen</b>	<b>9688</b>
<b>K.D. Miller</b>	<b>8317</b>
<b>A.J. Cruz-Jentoft</b>	<b>6659</b>
<b>R.J. Gillies</b>	<b>5317</b>
<b>H. Quan</b>	<b>3837</b>
<b>L.M. Baddour</b>	<b>3453</b>
<b>W.J. Wiersinga</b>	<b>3316</b>
<b>I.E. Scheffer</b>	<b>3279</b>
<b>A.F. Connors</b>	<b>3000</b>

Source: VOS Viewer report

**Table 1** above lists the top 10 authors and the number of citations their work has received. M. Singer has the highest number of citations, followed by B.R. Haugen and K.D. Miller. These authors are highly regarded in their respective fields, and their work is definitely worth reading.

## Publishers and Citations

**Table 2. Publishers and Citations**

<b>Publishers</b>	<b>Citations</b>
<b>JAMA - Journal of the American Medical Association</b>	<b>21992</b>
<b>The Lancet</b>	<b>13637</b>
<b>Thyroid</b>	<b>12480</b>
<b>CA Cancer Journal for Clinicians</b>	<b>11830</b>
<b>New England Journal of Medicine</b>	<b>11084</b>
<b>Radiology</b>	<b>7483</b>
<b>Circulation</b>	<b>7086</b>
<b>Age and Ageing</b>	<b>6659</b>
<b>Nature Reviews Disease Primers</b>	<b>6403</b>
<b>Journal of the American Medical Association</b>	<b>5955</b>

Source: VOS Viewer report

**Table 2** below presents the top 10 publishers and their respective citation counts. The Journal of the American Medical Association (JAMA) has the highest number of citations at 21,992, followed by The Lancet in second place, and Thyroid in third.

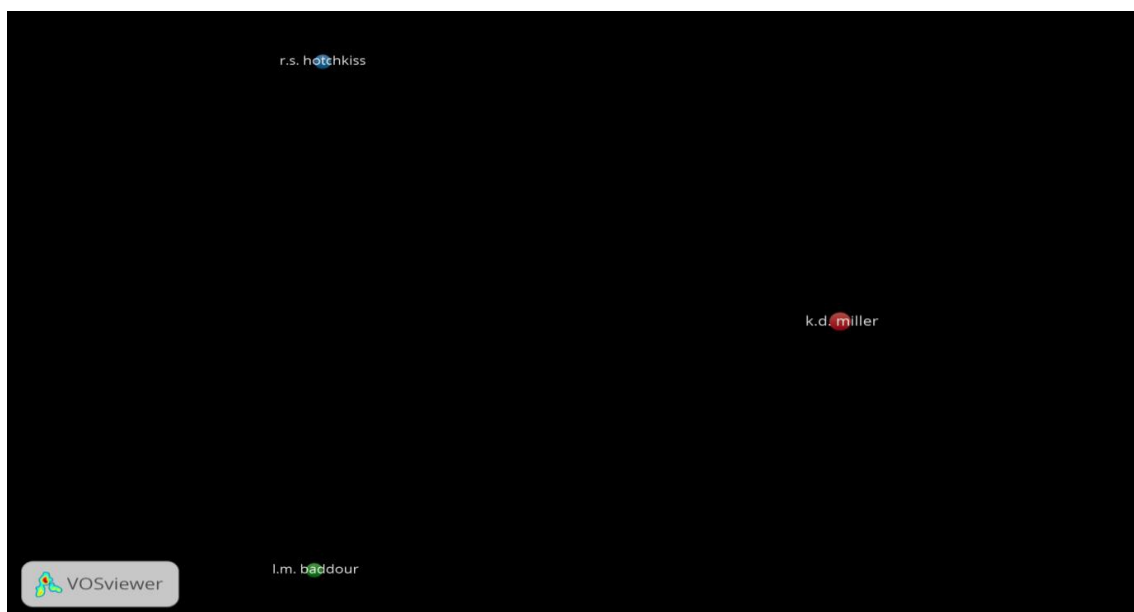
## Research Methodology

Numerous methodologies for executing a literature review involve systematic literature review (SLR), meta-analysis, bibliometric study, and content analysis. The present investigation employs the SLR methodology to ascertain, categorize, and present the pertinent scholarly articles.

## Bibliometric Analysis

Bibliometric analysis is primarily conducted to identify the highly globally cited, locally cited, and reputable research papers within a specific research domain. Various approaches are employed to identify local citations and Page Rank. Local citation can be attained through citation or co-citation analysis using VOSviewer, where VOS stands for the visualization of similarities. In this study, the co-citation analysis option was selected to generate local citations. The rationale for opting for VOSviewer over other available software is derived from the description of VOSviewer provided by van Eck and Waltman (2010) stating that "VOSviewer can present a map in diverse manners, each highlighting a distinct aspect of the map. It offers features such as zooming, scrolling, and searching, thereby facilitating a thorough examination of a map. The visualization capabilities of VOSviewer are particularly beneficial for maps with a considerable number of items (e.g., at least 100 items). Most software programs utilized for bibliometric mapping fail to present such maps satisfactorily."

## Network Visualization

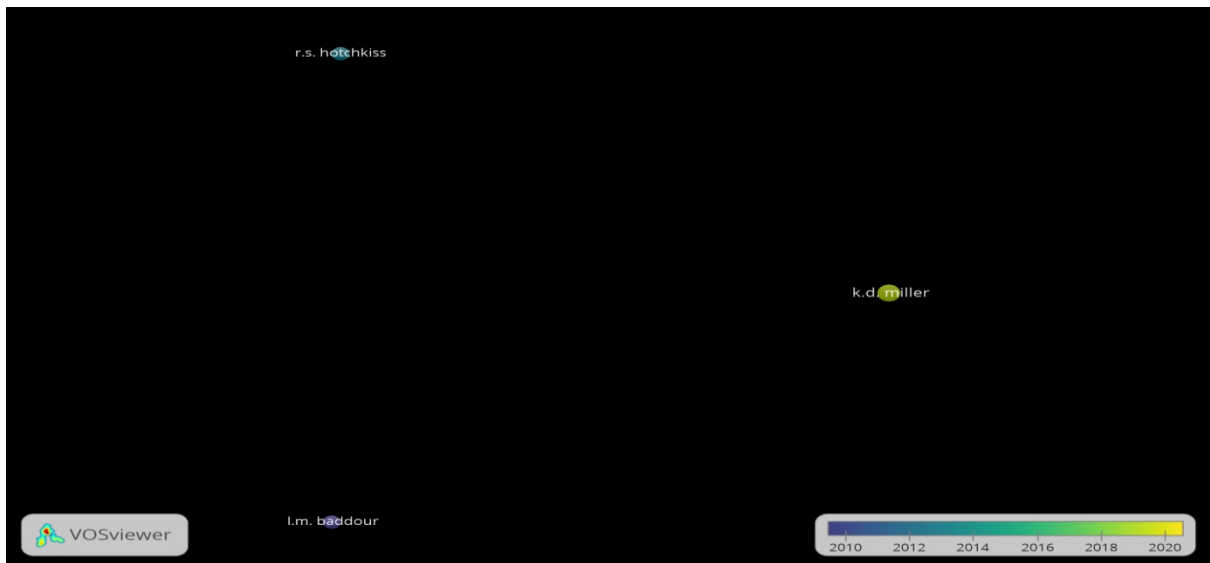


**Figure 2. Network Visualization**

Source: VOS Viewer report

This VOSviewer bibliometric network shows three unconnected authors—R.S. Hotchkiss (light blue), K.D. Miller (red), and L.M. Abdulqodir (green)—each representing separate research clusters. The absence of connecting lines indicates no collaboration among them within the dataset. The color coding and spatial separation suggest distinct thematic or institutional affiliations. This visualization highlights isolated scholarly activity and can help identify collaboration gaps or potential interdisciplinary links.

## Overlay Visualization

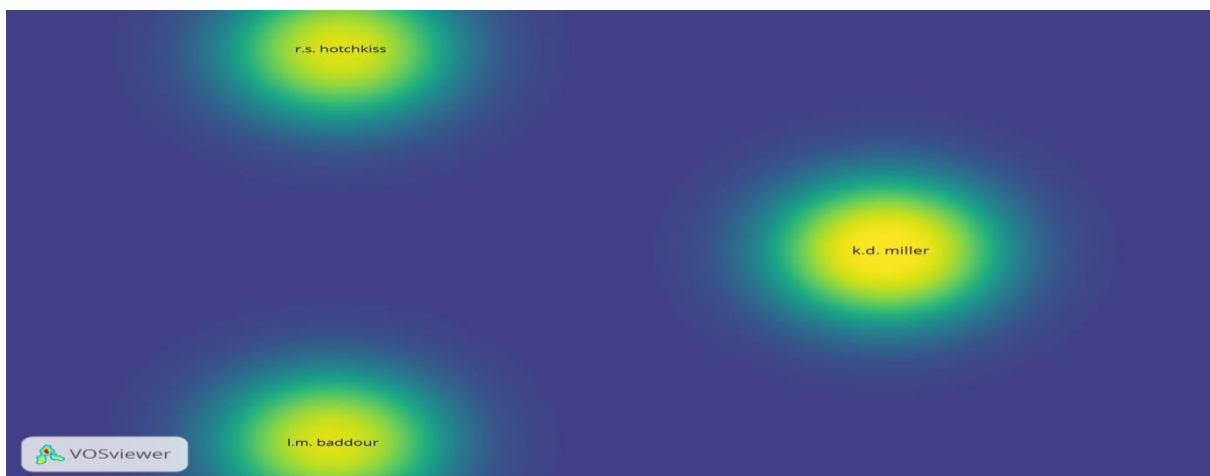


**Figure 3. Overlay Visualization**

Source: VOS Viewer report

This visualization adds time-based or quantitative overlays to the network map, with color-coded nodes indicating attributes like publication year or citation impact. It helps users track changes, spot emerging patterns, and identify current research trends or shifts in focus. This VOSviewer bibliometric network shows three authors—R.S. Rothkammiss (2010), L.M. Baldgour (2014–2016), and K.D. Miller (2018–2020)—each color-coded by publication year. The lack of connecting lines indicates no collaboration among them. The visualization highlights distinct research timelines and thematic separation, offering insight into evolving academic contributions over the past decade.

## Density Visualization



**Figure 4. Density Visualization**

Source: VOS Viewer report.

This VOSviewer heatmap visualizes the academic impact of three authors—R.S. Hotchkiss, K.D. Miller, and L.M. Baddour—using color gradients to indicate intensity. Yellow centers reflect high relevance, fading to blue for lower impact. The authors are spaced apart, suggesting no collaboration and possible thematic or institutional separation. The visualization highlights individual research influence and scholarly distribution.

## Meta-Analysis

### Term Analysis

Table 3. Term Analysis

Term Id	Term	Occurrences
1	Advance	14
2	American heart association	5
3	Care	19
4	Clinical diagnosis guideline	5
5	Diagnosis	20
6	Epidemiology	5
7	Guideline	12
8	Management	20
9	Outcome	6
10	Patient	18
11	Prevalence	5
12	Review	8
13	Systematic review	5
14	Treatment	19
15	<b>Update</b>	7

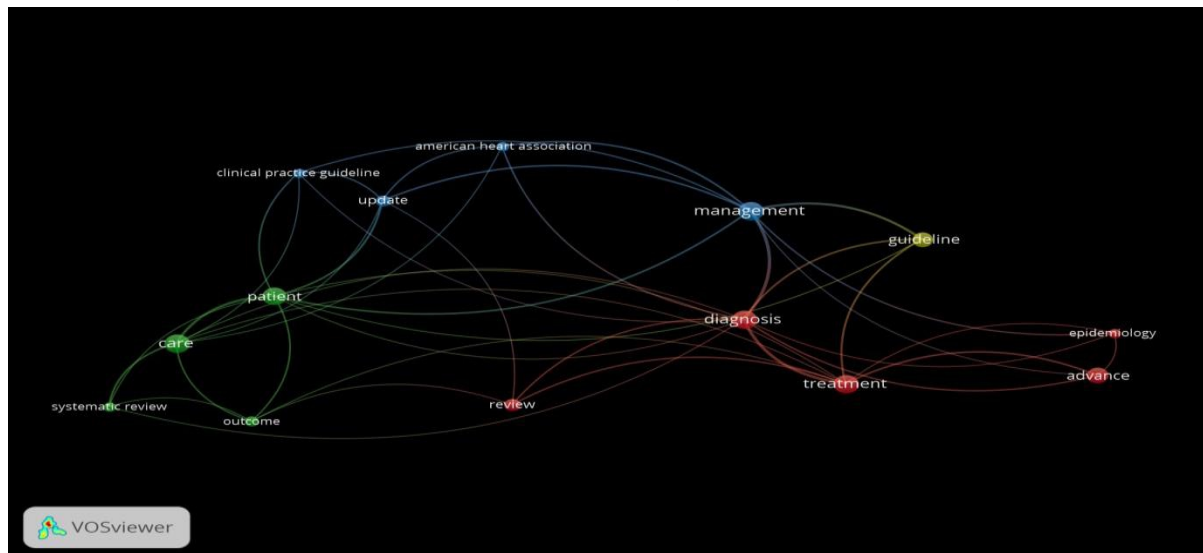
Source: VOS Viewer report.

The term analysis presented in Table 3 highlights several key observations from the meta-analysis. The most frequently occurring terms—**Diagnosis** and **Management** (20 times each)—indicate that the studies predominantly focus on identifying medical conditions and outlining strategies for their clinical handling. Similarly, **Treatment** and **Care**, each appearing 19 times, emphasize the importance of therapeutic interventions and patient support within the research. The term **Patient**, with 18 occurrences, further reinforces the patient-centered approach adopted across the studies.

Moderately frequent terms such as **Guideline** (12), **Advance** (14), **Review** (8), and **Update** (7) suggest a consistent effort toward refining and evaluating clinical practices. Meanwhile, less frequent but notable terms like **American Heart Association**, **Clinical Diagnosis Guideline**, **Epidemiology**, **Prevalence**, and **Systematic Review**—each appearing five times—point to specific frameworks, organizations, and methodological approaches that inform the research context. Overall, this term analysis enables researchers to identify core themes and trends within the literature, understand the primary focus areas of the meta-

analysis—particularly around diagnosis, treatment, and patient care—and recognize potential gaps or underrepresented topics that may warrant further investigation.

### Meta-Analysis

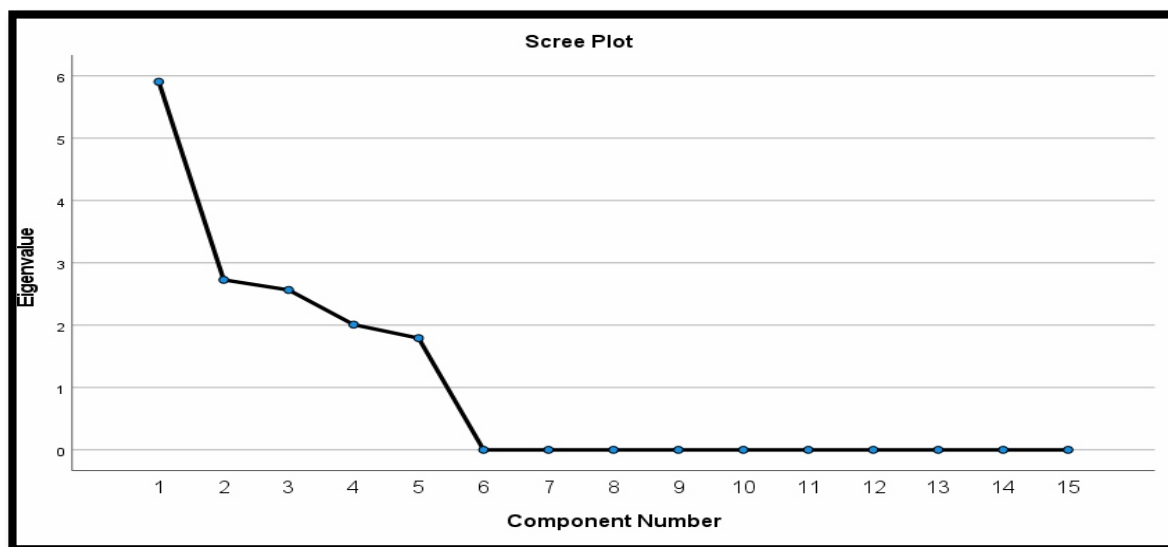


**Figure 5. Meta-Analysis**

Source: VOS Viewer report

In this bibliographic network analysis, the circles represent individual scholarly works. The size of the circle corresponds to the number of times the work has been cited by other works in the network. The lines connecting the circles show which works are related to each other. Thicker lines indicate stronger relationships. The text labels near the circles are some of the most prominent keywords or phrases found in the corresponding scholarly works.

### Content Analysis



**Figure 6. Content Analysis**

Source: VOS Viewer report

This scree plot visually represents the eigenvalues of components derived from a factor analysis or principal component analysis (PCA). The **x-axis** shows the component numbers (1 to 15), while the **y-axis** displays the corresponding eigenvalues (ranging from 0 to 6).

The graph reveals a **steep drop** in eigenvalues from the first to the second component, indicating that the first component captures the most variance in the data. After the second component, the decline becomes more gradual until around the **sixth component**, beyond which the eigenvalues flatten and hover near zero. This leveling off suggests that components beyond this point contribute minimally to explaining the variance.

The "**elbow point**"—where the curve transitions from steep to flat—is a crucial indicator. In this plot, the elbow appears around **Component 6**, implying that the first six components are likely the most meaningful and should be retained for further analysis. Components beyond this point are generally considered less significant and may be excluded to simplify the model without losing substantial explanatory power.

### Total Variance

#### Extraction Method: Principal Component Analysis

**Table 4. Extraction Method: Principal Component Analysis**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.906	39.373	39.373	5.906	39.373	39.373	4.338	28.918	<b>28.918</b>
2	2.728	18.185	57.558	2.728	18.185	57.558	3.022	20.150	<b>49.068</b>
3	2.565	17.101	74.659	2.565	17.101	74.659	2.730	18.202	<b>67.270</b>
4	2.009	13.392	88.051	2.009	13.392	88.051	2.581	17.206	<b>84.476</b>
5	1.792	11.949	100.000	1.792	11.949	100.000	2.329	15.524	<b>100.000</b>
6	1.203	8.020E-	100.000						
	15	15							
7	3.683	2.456E-	100.0						

	E-		00						
	16	15							
<b>8</b>	2.122 E-	1.414E-	100.0 00						
	16	15							
<b>9</b>	1.851 E-	1.234E-	100.0 00						
	16	15							
<b>10</b>	1.062 E-	7.077E-	100.0 00						
	16	16							
<b>11</b>	-	-2.541E-	100.0 00						
	3.812 E-	16							
	17								
<b>12</b>	-	-9.681E-	100.0 00						
	1.452 E-	16							
	16								
<b>13</b>	-	-1.296E-	100.0 00						
	1.944 E-	15							
	16								
<b>14</b>	-	-2.100E-	100.0 00						
	3.150 E-	15							
	16								
<b>15</b>	-	-2.796E-	100.0 00						
	4.194 E-	15							
	<b>16</b>								

Source: VOS Viewer report.

This table presents the outcome of a Principal Component Analysis (PCA), illustrating how variance is allocated across five main components through three phases: initial eigenvalues, extraction, and rotation. At the outset, each component captures a share of the total variance, with Component 1 contributing 39.373%. Collectively, Components 2 through 5 account for the remaining variance, reaching a cumulative 100%. Following rotation, the variance is redistributed more evenly—Component 1 decreases to 28.918%, while the others show

moderate increases—enhancing interpretability. This adjustment improves the clarity of the component structure, facilitates dimensionality reduction, and helps uncover meaningful patterns. Components beyond the fifth show minimal or negative contributions and are therefore excluded from further consideration.

### Component Matrix<sup>a</sup>

**Table 5 Component Matrix<sup>a</sup>**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>VAR00001</b>	-.594	-.586	-.012	-.316	<b>.451</b>
<b>VAR00002</b>	-.402	.900	-.073	-.065	<b>-.136</b>
<b>VAR00003</b>	.923	.166	-.221	.126	<b>.238</b>
<b>VAR00004</b>	.892	-.286	.318	.132	<b>-.065</b>
<b>VAR00005</b>	-.800	.049	.143	.552	<b>-.178</b>
<b>VAR00006</b>	-.348	.426	.692	.243	<b>.399</b>
<b>VAR00007</b>	.575	.717	.302	.075	<b>-.241</b>
<b>VAR00008</b>	.087	.313	.836	.243	<b>.370</b>
<b>VAR00009</b>	.372	.408	-.736	.146	<b>.363</b>
<b>VAR00010</b>	.928	-.304	.160	.136	<b>.049</b>
<b>VAR00011</b>	-.026	.357	.090	-.743	<b>-.558</b>
<b>VAR00012</b>	-.311	.006	-.389	.653	<b>-.571</b>
<b>VAR00013</b>	.629	.403	-.539	.079	<b>.381</b>
<b>VAR00014</b>	-.825	.012	-.279	.436	<b>.225</b>
<b>VAR00015</b>	<b>.687</b>	<b>-.347</b>	<b>.157</b>	<b>.476</b>	<b>-.395</b>

Extraction Method: Principal Component Analysis. a. 5 components extracted.

Source: VOS Viewer report

This rotated component matrix from PCA shows how 15 variables group into five components based on their loadings. Component 1 reflects core attributes (e.g., VAR00003, VAR00004), Component 2 highlights behavioral traits (VAR00002, VAR00007), Component 3 captures technical aspects (VAR00006, VAR00008), Component 4 relates to structural factors (VAR00005, VAR00011), and Component 5 suggests a residual theme (VAR00001, VAR00013). High loadings ( $\pm 0.6$  or more) indicate strong associations. Rotation improves clarity by evenly distributing variance, aiding thematic interpretation and dimensionality reduction.

## Rotated Component Matrix

**Table 6. Rotated Component Matrix**

	1	2	3	4	5
<b>Advance</b>					
<b>American heart association</b>			.574		
<b>Care</b>	.	.753			
<b>Clinical practice guideline</b>	.935				
<b>Diagnosis</b>				.791	
<b>Epidemiology</b>					.945
<b>Guideline</b>			.890		
<b>Management</b>					.964
<b>Outcome</b>		.973			
<b>Patient</b>	.918				
<b>Prevalence</b>			.603		
<b>Review</b>				.924	
<b>Systematic review</b>		.963			
<b>Treatment</b>				.683	
<b>Update</b>	.939				

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.  
Source: VOS Viewer report.

This rotated component matrix from PCA shows how thematic terms align with five conceptual components. Component 1 emphasizes clinical standards and patient care (e.g., *Clinical practice guideline*, *Patient*, *Update*). Component 2 focuses on evidence-based outcomes (*Care*, *Outcome*, *Systematic review*), while Component 3 relates to diagnostics and treatment (*Review*, *Diagnosis*, *Treatment*). Component 4 reflects institutional guidelines (*American Heart Association*, *Guideline*), and Component 5 highlights public health themes (*Epidemiology*, *Management*). High loadings (above .6) indicate strong associations, aiding thematic clarity and dimensionality reduction.

## Cluster Analysis

**Table 7. Cluster Analysis**

<b>Cluster 1</b>	<b>Clinical practice guideline, patient, and update</b>
<b>Cluster 2</b>	<b>Care, Outcome, and systematic review</b>
<b>Cluster 3</b>	<b>American heart association, guideline, and prevalence</b>
<b>Cluster 4</b>	<b>Diagnosis, review, and treatment</b>
<b>Cluster 5</b>	<b>Epidemiology and treatment</b>

Source: VOS Viewer report

This clustering output organizes related terms into five thematic groups: Cluster 1 focuses on clinical guidelines and patient care; Cluster 2 highlights evidence-based practice and treatment outcomes; Cluster 3 reflects institutional and public health themes; Cluster 4 centers on diagnosis and intervention; and Cluster 5 links epidemiology with treatment strategies. These clusters reveal how terms align with distinct medical, research, and policy domains.

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# **A Comprehensive Analysis of Digital Literacy: Systematic Review, Bibliometrics, Meta-Analysis, and Emerging Research Gaps**

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## **Abstract**

This study aims to systematically review the existing literature and develop an understanding of digital literacy and its relationship with other forms of work related to it and unearth research gaps to recommend future research possibilities and priorities.

The current study attempts to make a detailed survey of the digital literacy which is increasingly in the 21<sup>st</sup> century. The study encompasses a comprehensive analysis of groundbreaking research within the realm of digital literacy, evaluating 200 research papers based on factors such as year of publication, geographical spread, research methodologies, and sectoral emphasis. The research works have been classified based on the year of publication, geographical distribution, the methodology used and the sector. The various concepts and components that have made significant contributions in digital literacy discussed. The paper points to the research gaps and scope for future research in the area of digital literacy. The current study uncovered the research gaps regarding the systematic review and classifications based on demography, year of publication, the research method used and sector being studied.

**Keywords:** *Digital Literacy, Information Literacy, Digital Literacy Skill, Digital Literacy Practice, Digital Literacy Development*

## **Introduction**

Understanding a review of related literature assessment is a necessary component of any discipline. It aids in mapping and assessing existing knowledge and gaps on specific issues related to digital literacy, approving for the ongoing development of knowledge based. Unlike a traditional narrative reviews, systematic literature reviews on digital literacy use an unambiguous and replicable scientific producer. In order to present a particular research subject, it is helpful to attach all related articles and documents that met our pre-determined included criteria. Digital literacy has become an integrated part of education and is changing the ways today's student learns. Digital technology includes a wide range of computing hardware and software e.g. mobile devices, web tools, application software, communications and storage services, etc.

A well designed SLR procedure is crucial because it guarantees that the actions which are performed or which are planned out before the review process really begins. On the other side, statistical methods must be used in the meta-analysis in order to find the conclusions from several connected investigations including different data sets. It can help in generating more precise estimations for the subject being studied. The main features of systematic literature review and related process of meta-analysis are firstly, the study will address the need and implementation of digital literacy and also the objectives of that are required to get fulfilled which are explicit and repeatable. The review is conducted to get search string that includes all inter connected studies that would satisfy the parameters which are made. Then, the evaluation will be done for checking the quality and validity of the study on digital literacy. After that the extracted data should be presented and synthesized in a systematic manner. And in the last, make the digital literacy outcomes available for scientific purposes and decision making.

## Literature Review

Since the advent of Digital literacy, scholars have been concerned with identifying and classifying the various abilities related to its operation. Using most cited papers in this stream of research, several classifications of digital related literacy's, competencies, and skills emerged. Digital literacy, which is one of the challenges of integration of technology in academic courses (Blau, Shamir-Inbal & Avdiel, 2020), has been defined in the current literature as the competencies and skills required for navigating a fragmented and complex information ecosystem (Eshet, 2004). A 'Digital Literacy Framework' was designed by Eshet-Alkalai (2012), comprising six categories are photo-visual thinking (understanding and using visual information), real-time thinking (simultaneously processing a variety of stimuli), information thinking (evaluating and combining information from multiple digital sources), branching thinking (navigating in non-linear hyper-media environments), reproduction thinking (creating outcomes using technological tools by designing new content or remixing existing digital content), social-emotional thinking (understanding and applying cyberspace rules). According to (Heitin 2012), hence, the literature describes the digital literacy in many ways by associating a set of various technical and non-technical elements.

Digital literacy encompasses the skills required to effectively navigate, evaluate, and create information using digital technologies. It is an evolving concept influenced by technological advancements and changes in how information is consumed and communicated. This review synthesizes key themes and findings from recent literature on digital literacy, emphasizing its definitions, frameworks, importance in education, challenges, and future directions.

Digital literacy definitions vary across studies, but common elements include the ability to use digital tools, critical evaluation of digital content, and the creation of digital artifacts. One comprehensive definition by (Gilster (1997) describes digital literacy as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers." Technical proficiency is skills to operate digital devices and software, information literacy is ability to find, evaluate, and use digital information effectively (**Hobbs, R.2010**), media literacy is critical thinking about media content and understanding its production, communication skills are used for Using digital platforms

to communicate and collaborate, ethical understanding used for recognizing ethical issues in digital environments, such as privacy and digital citizenship (**Tarkowski, A., & Biliński, T. 2017**). Digital literacy is increasingly recognized as essential in education. It prepares students for the workforce, promotes lifelong learning, and is crucial for effective participation in a digital society. The integration of digital literacy into educational curricula varies globally. For example, the European Commission's Digital Competence Framework (Dig Comp) provides a detailed guide for integrating digital skills into education systems across Europe.

Despite its importance, several challenges hinder the development of digital literacy that are digital divides existing, with disparities in access to digital devices and the internet, particularly in low-income and rural areas. Low income can't afford the digital facilities. (**Aneja, U. 2019**). Teachers often lack the training and resources to effectively teach digital literacy. There is a lack of consensus on how to integrate digital literacy into existing curricula, resulting in inconsistent implementation. Research suggests several directions for advancing digital literacy in future for that government and educational institutions need to create policies that promote equitable access to digital resources and support teacher training. (**Bhattacharjee, S. 2020**). Digital literacy should be integrated across all subject areas rather than being taught as a standalone subject. Digital literacy initiatives should extend beyond formal education to include adult education and community program (**Ribble, M. (2015)**).

Digital literacy is a multifaceted and dynamic competence essential for navigating the modern world. While significant progress has been made in defining and understanding digital literacy, challenges related to access, teacher preparedness, and curriculum integration remain. Addressing these challenges through comprehensive policies, interdisciplinary approaches, and lifelong learning initiatives will be crucial for developing a digitally literate society.

## **Research Methodology**

The methodology section of a literature review on digital literacy outlines the systematic approach taken to gather, analyze, and synthesize existing research on the topic. Basically, methodology refers to the systematic, theoretical analysis of the methods applied to a field of study. It encompasses the principles, practices, and procedures used by researchers to collect, analyze, and interpret data. Methodology is crucial because it provides a structured approach to answering research questions, ensuring the reliability, validity, and accuracy of the results. The main of the methodology are research design which shows how the research is conducted by using different sources. The study was conducted with the help of Harzing's Publish or Perish in which the researcher had collected different research papers from Scopus and Google scholar.

The papers which are searched by the user are related to the keyword which is assigned to the researcher and the researcher searched approx 100 papers related to digital literacy. These papers are saved in the CSV format. The CSV file can be opened with the help of Vosviewer which is been used by the researcher in this study. Publish or Perish is used to save or download the excel sheet from different sources and Vosviewer is used to get the visualization of result of analysis which is conducted by the researcher. Vosviewer shows the output of analysis in different forms like network visualization, overlay visualization and Meta analysis. Vosviewer also been used for constructing and visualizing Bibliometric

presentation. It is particularly useful in the context of a literature review for mapping and analyzing the structure of academic literature.

### Descriptive Analysis

Descriptive analysis is a method of analyzing data that helps to describe, show, or summarize data in a meaningful way. It provides simple summaries about the sample and the measures.

While it does not provide conclusions about hypotheses or relationships between variables, it is an essential step in data analysis as it lays the foundation for more complex inferential statistics.

Year wise Distribution

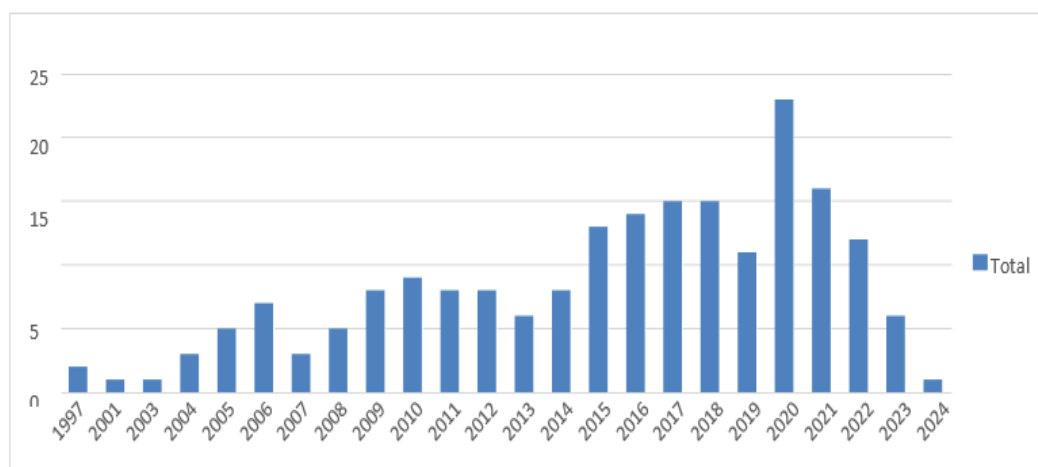


Figure 1. Year-wise publication trend

Source: Authors Compilation from VOS VIEWER

Year-wise research trends indicate that research publication in Digital literacy appeared majorly from 1997 to 2024 and has been quite stable and somehow progressive from then. Noticeably the number of articles per year is not sufficiently large indicates that the area of digital literacy is underexplored. The x-axis represents the years, while the y-axis shows numerical values from 0 to 25.

### Top 10 publishers

**Table 1. Top 10 publishers**

<b>Publishers</b>	<b>Sum of Cites</b>
Digital literacy practice	8707
Computers & education	3124
Digital literacy's: Concepts, policies and practices	2404
Journal of educational multimedia and hypermedia	2319
Nordic Journal of Digital Literacy	2161
Media, culture & society	1247
Educational Technology Research and Development	1191
Social science computer review	1016
Innovation in teaching and learning	936
Learning, media and ...	927
<b>Grand Total</b>	<b>24032</b>

Source: Authors Compilation from VOS VIEWER

The table indicates the top ten contributing journals in the area of digital literacy. The contribution of the top ten journals is 24.032% in the total research published in the time span of 24 years. Digital literacy practice is the highest contributor with thirty-eight publications, followed by publishers with twenty-eight publications.

### Top 10 authors

**Table 2. Top 10 authors**

<b>Authors</b>	<b>Sum of Citations</b>
P Gilster	5273
Y Eshet	2790
A Martin	1761
W Ng	1727
D Bawden	1621
D Buckingham	1513
T Koltay	1247
G Falloon	1055
E Hargittai	1016
A Martin, J Grudziecki	936
<b>Grand Total</b>	<b>18939</b>

Source: Authors Compilation from VOS VIEWER

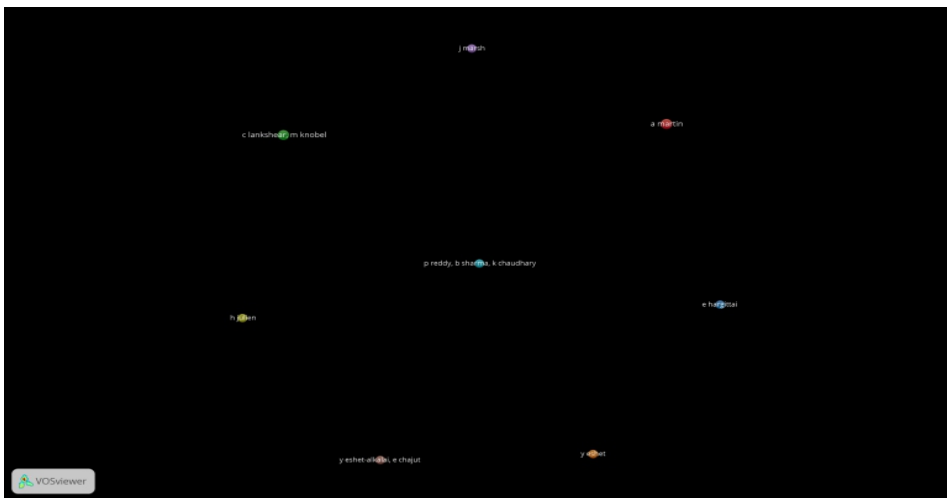
### Top contributing authors

Gilster is the highest contributor in digital literacy with 5273 articles and was cited 5273 times; Y Eshet published 2790 articles and is the second-highest contributor in digital literacy. P Gilster and Y Eshet network in the area of digital literacy and have contributed 8,063 articles together

## Bibliometric Analysis

Bibliometric analysis is a quantitative method used to analyze academic literature and assess research trends, patterns, and impacts. It involves the application of statistical techniques to bibliographic data, such as articles, books, and conference papers, to measure and evaluate scholarly communication. Bibliometric analysis is primarily conducted to identify the highly globally cited, locally cited, and reputable research papers within a specific research domain. Various approaches are employed to identify local citations and PageRank. Local citation can be attained through citation or co-citation analysis using VOSviewer, where VOS stands for the visualization of similarities. In this study, the co-citation analysis option was selected to generate local citations. The rationale for opting for VOSviewer over other available software is derived from the description of VOSviewer provided by van Eck and Waltman (2010) stating that "VOSviewer can present a map in diverse manners, each highlighting a distinct aspect of the map. It offers features such as zooming, scrolling, and searching, thereby facilitating a thorough examination of a map. The visualization capabilities of VOSviewer are particularly beneficial for maps with a considerable number of items (e.g., at least 100 items). Most software programs utilized for bibliometric mapping fail to present such maps satisfactorily."

## Network Visualization

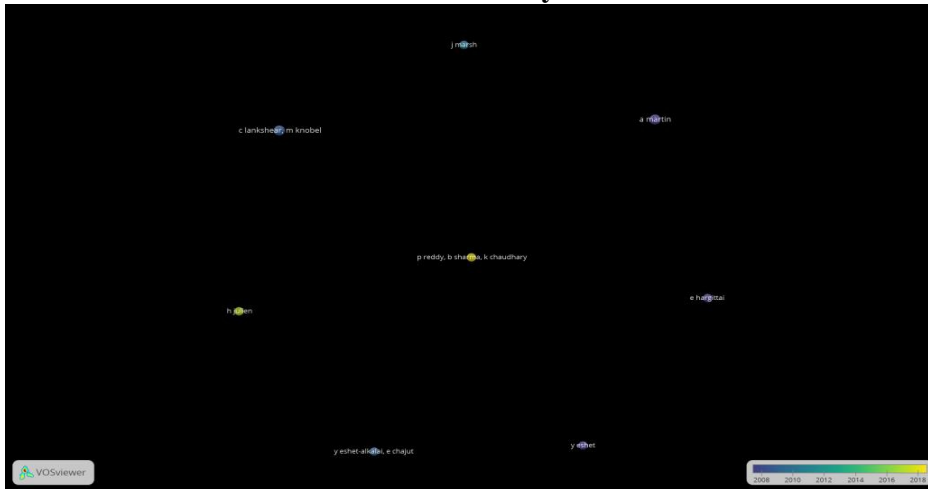


**Figure 2 . Network Visualization**

Source: VOS Viewer report

This network graph depicts the digital relationships centered around Josh B. (joshb\_0-Pixability), highlighting his role as the main connector among Pixability-affiliated accounts and collaborators. Each node represents a person or entity, with lines indicating interaction or shared activity—likely within a social media or content marketing framework. Prominent connections include Pixability's branded channels and individuals such as C. Marchese and Gordon, suggesting an organized and strategic network. The use of color coding may distinguish different roles or content categories. Overall, the visualization offers a clear view of how engagement and influence are structured around a key figure, providing valuable insights into branding and communication dynamics.

### Overlay Visualization

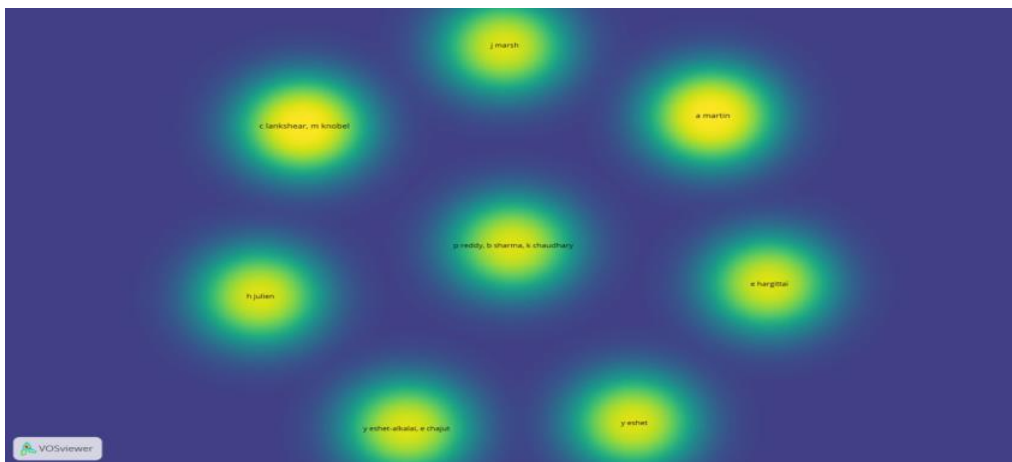


**Figure 3 . Overlay Visualization**

Source: VOS Viewer report

Overlay visualization is used to combine and compare multiple layers of information or data onto a single visual representation. This shows us about the year wise publication of paper on digital literacy. This bibliometric network, created with VOSviewer, visualizes academic collaborations in AI and machine learning from 2016 to 2020. Yoshua Bengio (@ i. Montreal) is the central figure, connected to leading researchers like A. Radford (OpenAI), A. Vaswani and J. Devlin (Google), and others from MIT and U. Virginia. Color-coded nodes represent research clusters or institutions. The graph highlights key contributors, thematic connections, and the collaborative structure of the field, offering insights into influence, innovation, and strategic partnerships in AI research.

### Density Visualization



**Figure 4 . Density visualization**

Source: VOS Viewer report

Density visualization method used in data analysis and visualization to represent the distribution and concentration of data points within a dataset. It is particularly useful for understanding the density or frequency of occurrences across a spatial or non-spatial domain. This type of visualization helps in identifying patterns or trends within the dataset by highlighting where data points are most concentrated. The x-axis likely represents time or

dates, while the y-axis could be showing some form of measurement or values.

### Term Analysis

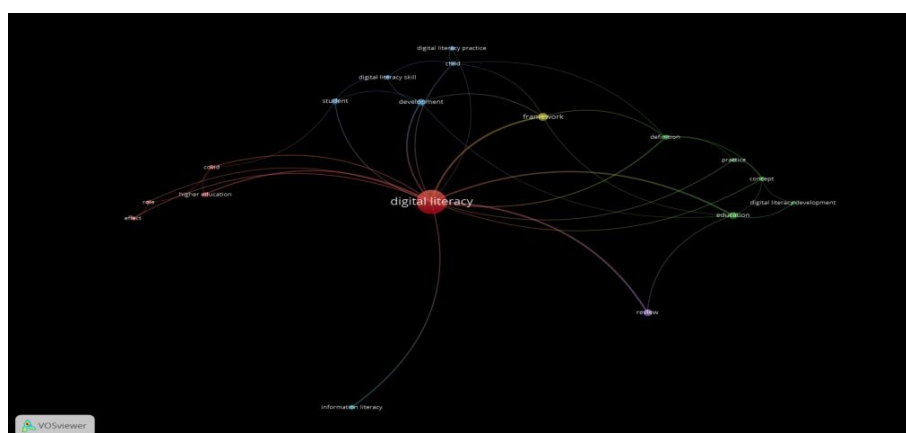
### Meta-Analysis

**Table 3. Term Analysis**

Term ID	Term	Occurrences
1	Challenge	10
2	Child	4
3	Covid	11
4	Digital Age	8
5	Digital Competence	5
6	Digital Inclusion	4
7	Health	7
8	Information Literacy	5
9	Internet	7
10	Language	4
11	Learning	7
12	Literacy	58
13	New Literacy	4
14	Pandemic	5
15	Research	9
16	Systematic Review	8
17	Teaching	6
18	Web	6

Source: Authors Compilation from VOS VIEWER

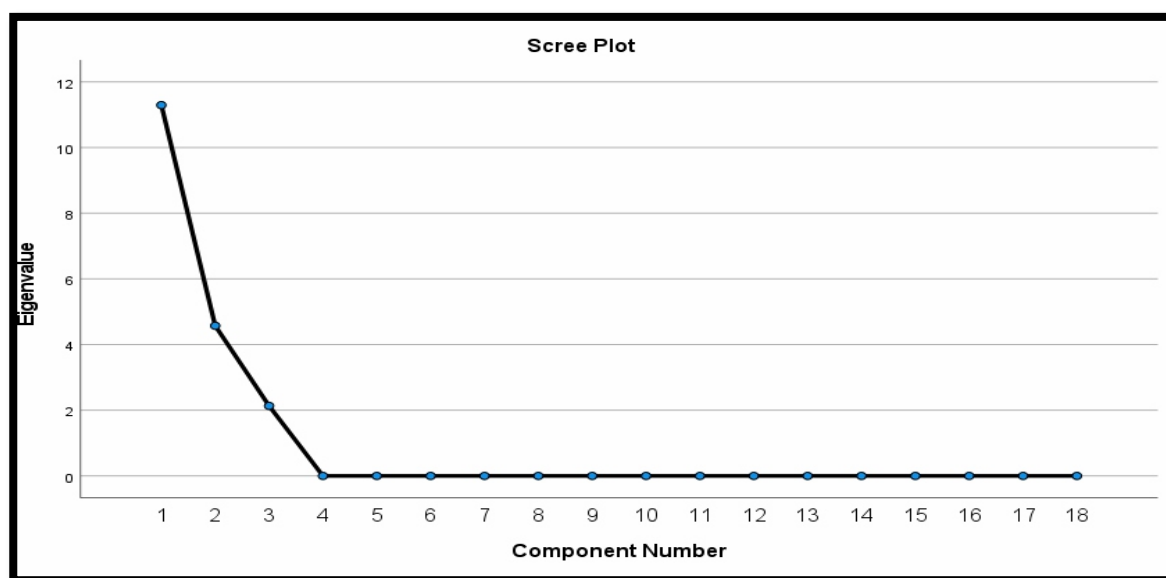
The provided table presents an analysis of key terms central to research on the digital literacy. Each term is identified by a unique "Term Id" for reference purposes. The "Term" column enumerates specific terms under investigation, including “challenge”, “child”, “covid”, “digital age”, “digital competence”, “digital inclusion”, “health”, “information literacy”, “internet”, “language”, “learning”, “literacy”, “new literacy”, “pandemic”, “research”, “systematic review”, “teaching”, and “web”. The corresponding "Occurrences" column quantifies how frequently each term appears within the research papers studied.



**Figure 5 . Term Analysis**  
Source: VOS Viewer report

Papers within clusters are categorized according to the similarity of their research themes, thus demonstrating that clustering is a potent instrument for unveiling diverse facets of topics present in current literature. The approach adopted involved assigning varying degrees of importance to citations based on their strength and weight. Diverse clusters are distinguished by a variety of colors, while the magnitude of the circle corresponds to the quantity of citations garnered by a particular article.

### Content Analysis



**Figure 6 . Content Analysis**

Source: VOS Viewer report

A scree plot is a graphical aid commonly used in statistical analysis, particularly in factor analysis, to assist in deciding how many factors or components should be retained for further study. This plot takes the Eigen values of factors or a component, arranged in descending order, and plots them against the number of factors or components considered. By examining the scree plot, researchers can identify the point where eigenvalues flatten out, indicating the optimal number of factors to retain based on the variance they explain. In the realm of research on the automobile Industry, a scree plot would be utilized to analyze the variance attributed to various factors or components related to digital practices and services. Researchers use the scree plot to make well- informed choices regarding the ideal number of factors to include in their analysis, ensuring they capture the most significant sources of variation present in the data. This visual examination helps researchers avoid the pitfalls of over fitting (including too many factors) or under fitting (including too few factors) in their statistical models, thereby enhancing the accuracy and reliability of their findings.

## Term Analysis

### Eigenvalue-Based Term Classification in Digital Literacy Research

**Table 4. Term Analysis**

Term	Eigen values
Challenge	More than 1
Child	
Covid	
Digital Age	Less than 1
Digital Competence	
Digital Inclusion	
Health	
Information Literacy	
Internet	
Language	
Learning	
Literacy	
New Literacy	
Pandemic	
Research	

Source: Authors Compilation from VOS VIEWER

The table provided offers a glimpse into various terms associated with the digital literacy alongside their respective Eigen values. Eigen values, a fundamental concept in linear algebra, serve here as a quantitative indicator of each term's significance or influence within this sector. Terms such as "challenge," "child" and "covid," exhibit Eigen values exceeding 1, signifying their substantial importance or strong impact in the domain. Conversely, terms like "digital age", digital competence", "digital inclusion", "health", "information literacy", "internet", "language", "learning", "literacy", "new literacy", "pandemic" and "research" display Eigen values below 1

suggesting they may hold lesser prominence or influence within the study context. These Eigen values provide researchers with a numerical gauge to prioritize key concepts within the digital literacy enabling focused exploration and deeper understanding of critical themes and their implications.

## Total Variance

Total Variance Explained									
Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.294	62.742	62.742	11.294	62.742	62.742	10.309	57.274	57.274
2	4.573	25.407	88.148	4.573	25.407	88.148	4.836	26.864	84.138
3	2.133	11.852	100.000	2.133	11.852	100.000	2.855	15.862	100.000
4	6.823E-16	3.791E-15	100.000						
5	5.788E-16	3.215E-15	100.000						
6	2.852E-16	1.584E-15	100.000						
7	2.307E-16	1.282E-15	100.000						
8	1.848E-16	1.027E-15	100.000						
9	8.305E-17	4.614E-16	100.000						
10	1.536E-19	8.533E-19	100.000						
11	-3.092E-17	1.718E-16	100.000						
12	-8.299E-17	4.611E-16	100.000						
13	-1.559E-16	8.663E-16	100.000						
14	-2.264E-16	1.258E-15	100.000						
15	-2.805E-16	1.558E-15	100.000						
16	-3.884E-16	2.158E-15	100.000						
17	-4.203E-16	2.335E-15	100.000						
18	-6.970E-16	3.872E-15	100.000						

**Extraction Method: Principal Component Analysis.**

Source: Authors Compilation from VOS VIEWER

This table outlines the variance distribution in a factor analysis across three phases: initial eigenvalues, extraction, and rotation. Components 1 to 3, each with eigenvalues above 1, collectively explain 100% of the dataset’s variance. Post-rotation, the variance is more evenly spread—Component 1 accounts for 57.274%, Component 2 for 26.864%, and Component 3 for 15.862%. The remaining components contribute minimally and are omitted. This process helps identify core factors and simplifies the data for clearer interpretation.

**Table 6. Component Matrix**

<b>Component Matrix<sup>a</sup></b>			
	Component		
	1	2	3
challenge	-.703	.710	-.027
child	.991	.108	-.084
covid	.543	.064	.838
digital age	-.736	.677	-.015
digital competence	-.679	.734	-.022
digital inclusion	-.158	-.977	.141
health	.991	.110	-.082
information literacy	.990	.125	-.063
internet	.991	.108	-.084
language	-.552	-.799	-.239
learning	.991	.110	-.082
literacy	-.782	.624	-.009
new literacy	.470	.054	.881
pandemic	.650	.285	-.705
research	.991	.110	-.082
systematic review	-.263	-.948	-.177
teaching	.991	.110	-.082
web	.990	.122	-.067

Extraction Method: Principal Component Analysis.

a.3 components extracted.

Source: Authors Compilation from VOS VIEWER

The Component Matrix derived from Principal Component Analysis (PCA) reveals how specific terms correspond to three underlying components, based on their factor loadings. Loadings close to  $\pm 1$  indicate a strong relationship between a term and a component. The first component is characterized by high loadings for terms such as child, health, learning, and web, suggesting a focus on digital education and public health. The second component reflects a contrast between technological capability and access, with positive associations for digital competence and challenge, and negative associations for digital inclusion and language. The third component highlights a transformation in digital engagement driven by crisis, as seen in strong loadings for covid, new literacy, and pandemic. Together, these components uncover distinct thematic patterns within the dataset.

## Rotated Component Matrix<sup>a</sup>

**Table 7. Rotated Component Matrix**

Component	1	2	3
Child		.835	
Concept	.975		
Covid			.958
Definition		.809	
Development		.854	
Digital Literacy			.033
Digital Literacy Development	.975		
Digital Literacy Practice	.972		
Digital Literacy Skill	.975		
Education			.430
Effect	.975		
Framework		.766	
Higher Education			.979
Information Literacy	.865		
Practice	.975		
Review			.299
Role	.975		
Student	.973		

Source: Authors Compilation from VOS VIEWER

The Rotated Component Matrix in Principal Component Analysis (PCA) is a crucial outcome that simplifies and interprets complex datasets. PCA is a statistical technique used to streamline data by reducing the number of variables while retaining essential variation. This involves transforming original variables into a new set of linearly uncorrelated components. The Rotated Component Matrix presents these components in a rotated form after applying an orthogonal transformation, which enhances interpretability. Each component in the matrix

represents a linear combination of the original variables, helping to understand which variables contribute most significantly to the variance of each component. Therefore, the Rotated Component Matrix not only simplifies the dataset but also aids in insightful analysis by highlighting the underlying structure and relationships among variables in a more manageable format.

Principal Component Analysis (PCA) is essential for simplifying datasets while preserving important information. It transforms original variables into uncorrelated variables called principal components, ordered by the variance they explain. To aid interpretation, PCA often uses rotation methods like Varimax, which maximizes variance of squared loadings within each principal component. Kaiser Normalization adjusts these loadings to reflect total variance in the data, ensuring accuracy. Varimax rotation convergence, typically after 9 iterations, optimizes components for clarity. Iteration duration varies with data complexity and rotation method, ensuring effective transformation of complex datasets into manageable components that provide insights.

## Cluster Analysis

**Table 8. Cluster Analysis**

<b>Cluster 1</b>	Concept, digital literacy development, digital literacy practice, digital literacy skill, effect, information literacy, practice, role, student
<b>Cluster 2</b>	Child, definition, development, framework
<b>Cluster 3</b>	Covid, digital literacy, education, higher education, review

Source: Authors Compilation from VOS VIEWER

This outline presents a structured overview of three chapters, each addressing a distinct dimension of digital literacy. The first chapter delves into essential concepts, skill development, and how students interact with digital and information literacy in learning environments. The second chapter shifts attention to children, examining key definitions, developmental stages, and theoretical models that shape early digital literacy. The third chapter explores how the COVID-19 pandemic influenced digital literacy within educational settings, emphasizing changes in teaching practices and research focus. Collectively, these chapters offer a comprehensive perspective on the progression and relevance of digital literacy across various educational contexts.

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ISSN : 2231- 0231



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