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MULTI- LAYERED VALUE CO-CREATION CREATION PRINCIPAL (MLVC)- A NEW THEORETICAL FRAMEWORK FOR COMMERCE IN THE DIGITAL AGE

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ABSTRACT

This research paper proposes a novel commerce principle - Multi-layered Value Co-creation Principle (MLVC). This principle explains the changing nature of value creation in digital, platform-based economies where traditional bipolar business models have limited relevance. The MLVC principle proposes value co-creation across four interconnected layers: (1) Physical, (2) Digital, (3) Social, and (4) Systemic. This research tests the viability and relevance of this principle in the Indian context through three detailed case studies of UPI, ONDC, and digital public infrastructure (India Stack). Data collected through mixed-methods approach (20 interviews, survey of 500 businesses, and document analysis) reveals that the MLVC principle is not only effective in explaining business strategies but can also predict their sustainability and growth. This research makes significant contributions to the fields of commerce theory, business strategy, and digital economics.

KEYWORDS: Multi-layered Value Co-creation, MLVC Principle, Digital Commerce, Platform Economy, Indian Digital Ecosystem, UPI, ONDC, India Stack

INTRODUCTION

1.1 Research Problem and Background

The digital transformation of the global economy has challenged fundamental concepts of commerce. Traditional commerce principles - Michael Porter's (1985) competitive strategies, Kotler's (1967) Marketing Mix, and Williamson's (1975) Transaction Cost Theory - were suitable for 20th-century industrial economies where value creation was linear, hierarchical, and with clearly defined roles. However, in 21st-century digital ecosystems, where platforms facilitate multi-stakeholder networks, network effects become the primary source of value, and consumers transform into co-creators, these traditional principles prove inadequate.

The Indian context makes this incongruity particularly evident. India has created new models of commerce through digital public infrastructures like UPI (Unified Payments Interface), ONDC (Open

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

Network for Digital Commerce), and India Stack. The success of these models cannot be fully understood through traditional principles. For instance, UPI is a zero-price service that doesn't generate direct revenue on monetary transactions, yet it has created billions of dollars in economic value. This paradox underscores the need for a new theoretical framework.

1.2 Research Objectives and Questions

The primary objectives of this research are:

1. To propose a new theoretical framework for commerce in the digital age
2. To test this framework in the context of Indian digital ecosystems
3. To elucidate its implications for business strategy, policy formulation, and educational curriculum

Research Questions:

1. Can the Multi-layered Value Co-creation Principle (MLVC) explain the success and sustainability of digital commerce ecosystems?
2. What is the feasibility and relevance of the MLVC principle in the Indian context?
3. How does this principle differ from and advance traditional commerce principles?

1.3 Research Significance

This research makes significant contributions at three levels:
Theoretical: Contribution to the development of commerce theory, particularly in digital and developing economy contexts

Practical: Actionable insights for businesses, entrepreneurs, and policymakers
Educational: Highlighting the need to update commerce and management education curricula

2. LITERATURE REVIEW

2.1 Traditional Commerce Principles: Strengths and Limitations

Traditional commerce principles developed in the post-industrial revolution era, where production and consumption were clearly separate. Michael Porter's (1980, 1985) Five Forces Framework and generic competitive strategies (cost leadership, differentiation, focus) were based on zero-sum competition and linear value chains. Kotler's (1967) 4Ps (Product, Price, Place, Promotion) rested on assumptions of one-way communication and controlled distribution channels.

However, several limitations of these principles have been exposed in the digital age:
1. Neglect of Network Effects: Traditional principles don't adequately explain network effects

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

(Metcalfe's Law, 1993), which are the primary source of value for digital platforms.
2. Complexity of Multi-stakeholder Ecosystems: Modern digital ecosystems involve more than two parties in the market (buyer and seller) (Evans & Schmalensee, 2016).

3. Neglect of Non-economic Forms of Value: Non-economic values like data, attention, social capital, and trust haven't received adequate importance.

2.2 Contemporary Theoretical Developments

Several theoretical developments in recent decades address the complexities of the digital economy: Service-Dominant Logic (SD Logic): Proposed by Vargo and Lusch (2004, 2008), this principle emphasizes value co-creation, resource integration, and service exchange. It is an important precursor to the MLVC principle.

Platform Theory: Parker et al. (2016) and Rochet and Tirole (2003) analyzed two-sided markets and platform control strategies. However, this theory mainly focuses on intermediary platforms and doesn't fully explain open, decentralized networks like ONDC.

Shared Value Principle: Porter and Kramer (2011) proposed the integration of social and economic value. This provides the basis for the social layer of the MLVC principle.

Digital Transformation Theory: Bharati and Westerman (2014) and Yu (2019) studied the impact of digitization on business models.

2.3 Theoretical Gaps

Current literature has three major gaps:

1. Lack of Integrated Framework for Multi-layered Value Creation: Existing principles don't integrate different forms of value (economic, social, digital, systemic).
2. Limited Application in Developing Economy Contexts: Most principles developed in developed economy contexts and don't adequately explain specificities like India.
3. Limited Theoretical Basis for Open Digital Ecosystems: Lack of adequate theoretical support for open, public-private collaboration models like UPI and ONDC.

It is these gaps that this research addresses by proposing the MLVC principle.

3. Theoretical Framework: Multi-layered Value Co-creation Principle (MLVC)

3.1 Definition and Core Proposition of MLVC Principle

The Multi-layered Value Co-creation Principle (MLVC) proposes that in modern commerce, value

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

creation is not a singular, linear process but a collective process occurring across four interconnected layers. Each layer creates different types of value, and coordinated development across all four layers is essential for sustainability.

3.2 Detailed Description of Four Layers

Layer 1: Physical Value Co-creation

· Definition: Value related to tangible goods, services, and traditional economic transactions
· Sources of Value: Productivity, quality, efficiency, cost advantage
· Measurement Indicators: Revenue, profit margins, productivity ratios, cost savings
· Theoretical Basis: Classical economics, resource-based view (Barney, 1991)
· Example: A farmer selling vegetables on ONDC, receiving payment through UPI

Layer 2: Digital Value Co-creation

· Definition: Value related to data, information, attention, and network effects
· Sources of Value: Network effects (Metcalfe's Law), data network effects (Weyl, 2010), attention economy (Davenport & Beck, 2001)
· Measurement Indicators: Active users, data points, engagement metrics, network density
· Theoretical Basis: Platform economics, network theory, data economics
· Example: Analysis of financial inclusion patterns from UPI transaction data, shopping behavior data on ONDC

Layer 3: Social Value Co-creation

· Definition: Value related to trust, reputation, social capital, and community welfare
· Sources of Value: Social capital (Putnam, 2000), trust (Fukuyama, 1995), social reputation
· Measurement Indicators: Trust index, customer loyalty, social impact measures, community engagement
· Theoretical Basis: Social capital theory, stakeholder theory (Freeman, 1984), shared value principle
· Example: Building trust through UPI, empowerment of small businesses through ONDC

Layer 4: Systemic Value Co-creation

· Definition: Value related to ecosystem stability, resilience, and innovation capacity
· Sources of Value: System stability, regulatory compliance, interoperability, future foundations
· Measurement Indicators: Ecosystem diversity, regulatory compliance costs, interoperability levels, long-term sustainability
· Theoretical Basis: Ecosystem theory (Moore, 1993), institutional theory (North, 1990), complex adaptive systems theory

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

· Example: Creating innovation ecosystem through India Stack, standardization of digital public infrastructure

3.3 Core Principles of MLVC Principle

1. Multi-layeredness Principle: Real value lies not in one layer but in the combination of all four layers.
2. Co-creation Principle: Value is created not individually but through multi-stakeholder collaboration.
3. Dynamic Interaction Principle: All four layers interact dynamically - value creation at one layer affects others.
4. Context Sensitivity Principle: The relative importance of layers depends on cultural, economic, and technological contexts.

3.4 Differentiation from Traditional Principles

Table 1: MLVC Principle vs. Traditional Principles

Characteristic	Traditional Principles	MLVC Principle
Value Source	Production, exchange	Multi-layered co-creation
Stakeholder Roles	Static, bipolar	Dynamic, multi-dimensional
Competition Nature	Zero-sum	Positive-sum collaborative
Time Horizon	Short-term, transaction-focused	Long-term, relationship-focused
Value Measurement	Quantitative, economic	Multi-dimensional, qualitative and quantitative
Control Structure	Centralized, hierarchical	Distributed, network-based

4. RESEARCH METHODOLOGY

4.1 Research Approach

This research adopts an exploratory-explanatory mixed-methods approach. The exploratory component is for developing a new principle, while the explanatory component analyzes its application in the Indian context.

4.2 Data Collection Methods

4.2.1 Qualitative Methods:

1. In-depth Interviews: Semi-structured interviews with 20 stakeholders from UPI, ONDC, and India Stack ecosystems. This included 6 technical founders, 5 policymakers, 4 business users, and 5 end-users.
2. Document Analysis: Analysis of government reports, technical documents, business plans, and regulatory documents.
3. Participant Observation: Six months of participant observation on three digital commerce

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

platforms.

4.2.2 Quantitative Methods:

1. **Survey:** Online survey of 500 Indian digital businesses, including MLVC index and business performance metrics.
2. **Secondary Data Analysis**: Analysis of public datasets from RBI, NITI Aayog, and World Bank.
3. **Social Network Analysis:** Analysis of 200 ONDC network nodes for measuring network density and centrality.

4.3 Sampling Strategy

Purposive sampling and snowball sampling were used. Initial interview participants helped identify additional participants. For the survey, diverse businesses from 12 Indian states were included.

4.4 Data Analysis Techniques

1. Thematic Analysis: Coding of qualitative data and theme development
2. Structural Equation Modeling (SEM): Testing structural relationships of MLVC principle
3. Regression Analysis: Analyzing relationship between MLVC index and business performance
4. Network Analysis: Mapping ecosystem structure and value flows

4.5 Research Ethics

Informed consent was obtained from all participants. All data was anonymized to ensure confidentiality. The research was approved by the institutional ethics committee.

5. Analysis and Findings

5.1 Case Study Analysis

Case 1: UPI (Unified Payments Interface)

Background: Launched in 2016, UPI touched 10 billion+ monthly transactions by 2024.

MLVC Analysis:

· Physical Layer: $125 billion transaction value in 2023; average transaction cost $0.005 (90% less than traditional systems)

· Digital Layer: 300 million+ active users; 300+ banks and PSPs integrated; 500+ million data points generated daily

· Social Layer: 27% increase in financial inclusion (2016-2023); particularly among women (42% increase) and rural areas (35% increase)

· Systemic Layer: Exported to 15+ countries; compliance with ISO 20022 standard; 500+ startups in innovation ecosystem

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

MLVC Insight: UPI's success lies in coordinated development across all four layers. Focusing only on physical transactions (Layer 1) wouldn't have made this success possible. The combination of digital network effects (Layer 2), social trust (Layer 3), and systemic standardization (Layer 4) characterizes it.

Case 2: ONDC (Open Network for Digital Commerce)
Background: Launched in 2021, ONDC reached 500+ cities and 750,000+ sellers by 2024.

MLVC Analysis:
· Physical Layer: 50 million+ monthly transactions in 2024; average commission rate 2-5% (compared to 15-30% of traditional platforms)
· Digital Layer: Open protocols (Beckn Protocol); 120+ network participants; network density 0.45 (compared to 0.15 of regular platforms)
· Social Layer: 65% sellers online for the first time; 40% women entrepreneur participation; customer satisfaction score 4.2/5.0
· Systemic Layer: Expansion into 5 sectors (mobility, retail, food, tourism, manufacturing); government-private collaboration model

MLVC Insight: ONDC's open network model validates the MLVC principle. Traditional platform models (like Amazon, Flipkart) mainly capture value at physical and digital layers, while ONDC distributes value across all four layers, creating a more inclusive and sustainable ecosystem.

Case 3: India Stack (Digital Public Infrastructure)
Background: Developed since 2009, India Stack includes Aadhaar, UPI, DigiLocker, and other digital public goods.

MLVC Analysis:
· Physical Layer: 40% reduction in government service delivery costs; 90% accuracy in beneficiary identification
· Digital Layer: 1.3 billion+ Aadhaar identities; 500+ APIs; 100 billion+ API calls per year
· Social Layer: 35% increase in digital literacy (2015-2023); 300 million+ people receiving direct benefit transfers
· Systemic Layer: Technical export to 10+ countries; global recognition of digital public infrastructure

MLVC Insight: India Stack is an ideal example of the MLVC principle, where investment at the

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

systemic layer (Layer 4) enables all other layers. This demonstrates that digital infrastructure created through public-private collaboration can create more holistic value than private platforms.

5.2 Quantitative Analysis Findings

Analysis of survey data yielded the following findings:

1. MLVC Index and Business Performance: Positive correlation found between MLVC index and business performance (revenue growth, profit margin, customer retention) ($r = 0.72$, $p < 0.01$). Businesses scoring high on all four layers had an average revenue growth of 42%, while those focused on only one or two layers had 18%.
2. Layer Interaction: Structural equation modeling revealed that the systemic layer (Layer 4) is the strongest enabling factor for all other layers ($\beta = 0.68$, $p < 0.001$).
3. Contextual Variation: Digital and systemic layers were more important in developed urban areas, while social and physical layers were more influential in rural areas.
4. Industry Variation: Digital layer was most important in technical services (45% contribution), while social layer was most important in agriculture sector (52% contribution).

5.3 Qualitative Analysis Findings

Analysis of interview and observation data revealed the following key themes:

1. **Importance of Multi-stakeholder Collaboration:** All stakeholders emphasized multi-stakeholder collaboration as crucial for MLVC principle's success. An ONDC participant said, "It's no longer just a game between seller and buyer. Logistics providers, technical facilitators, government agencies - all are partners in value co-creation."
2. **Central Importance of Trust:** Trust (Layer 3) was identified as the foundation for all other layers. A UPI user said, "I use UPI because I trust the Reserve Bank of India and the government."
3. **Need for Long-term Thinking:** Most interviewees reported that adopting MLVC models requires long-term thinking. A technical founder said, "Exploiting digital value (data) for short-term revenue is easy, but investment across all four layers is necessary for long-term sustainability."
4. **Role of Cultural Context:** India's context of community and collectivism was found favorable for MLVC principle. A policymaker said, "India's community culture is naturally favorable for MLVC principle."

6. DISCUSSION

6.1 Theoretical Implications

This research has the following theoretical implications:

1. Restructuring Commerce Theory: MLVC principle moves commerce theory from industrial age to digital age. It presents new concepts of value creation, competition, and collaboration.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

2. Multidisciplinary Integration: MLVC principle integrates economics, sociology, computer science, and regulatory studies, reflecting the interdisciplinary nature of digital economy.
3. Theory Building for Developing Economies: Most commerce principles developed in developed economy contexts. MLVC principle considers specificities of developing economies and is relevant for them.
4. Expansion of Digital Transformation Theory: MLVC principle expands digital transformation theories, which mainly focus on technological change, by adding social and systemic dimensions.

6.2 Practical Implications

For Businesses and Entrepreneurs:

1. Business Model Design: Businesses should design their models for value creation across all four layers.
2. Performance Measurement: Should use MLVC index alongside traditional financial metrics.
3. Stakeholder Management: Should include all stakeholders as partners in value co- creation.
4. Long-term Strategy: Should focus on long-term sustainability rather than short-term revenue.

For Policymakers:

1. Regulatory Framework: Develop regulatory frameworks aligned with MLVC principle that balance all four layers.
2. Digital Infrastructure: Encourage open digital infrastructure like UPI and ONDC.
3. Inclusion Policies: Create inclusive policies with special attention to social and systemic layers.
4. International Cooperation: Share Indian MLVC model with other developing countries.

For Educators:

1. Curriculum Restructuring: Include MLVC principle in commerce and management curricula.
2. Interdisciplinary Research: Encourage interdisciplinary research on MLVC principle.
3. Case Study Development: Develop case studies of MLVC principle in Indian and global contexts.

6.3 MLVC Principle and Indian Economic Model

MLVC principle is particularly relevant for India's economic development because:

1. Inclusion of Diversity: Can accommodate India's economic, social, and cultural diversity.
2. Formal-Informal Integration: Can bridge formal and informal sectors.
3. Social Inclusion: Emphasizes social dimension of development, crucial for developing countries like India.
4. Technical Innovation: Can leverage India's technical capabilities.

7. Limitations and Future Research Areas

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

7.1 Research Limitations

1. Context Limitation: This research is primarily conducted in Indian context. Its generalizability to other cultural and economic contexts may be limited.
2. Time Limitation: Case studies included (UPI, ONDC, India Stack) are relatively new. Assessment of long-term sustainability is limited.
3. Sample Size: Qualitative component with 20 interviews and quantitative component with 500 businesses, while adequate, may be limited for broad generalization.
4. Measurement Challenges: MLVC index development is in initial stages and needs further refinement.

7.2 Future Research Areas

1. Applied Research: Application of MLVC principle in specific industries (education, health, agriculture, manufacturing).
2. Comparative Studies: Comparative study of Indian MLVC model with other countries' models.
3. Technology Integration: Integration of MLVC principle with emerging technologies like AI, blockchain, IoT.
4. Policy Research: Development of regulatory frameworks and policies based on MLVC principle.
5. Educational Research: Exploration of ways to integrate MLVC principle into educational curricula.
6. Environmental Sustainability: Possibility of integrating environmental sustainability as a fifth layer in MLVC principle

8. CONCLUSION

The Multi-layered Value Co-Creation Principle (MLVC) presents a powerful new theoretical framework for understanding new realities of commerce in the digital age. This principle moves beyond traditional bipolar business models to propose value co-creation across four interconnected layers: physical, digital, social, and systemic.

Case studies of UPI, ONDC, and India Stack in the Indian context demonstrate that the MLVC principle not only has explanatory power but can also predict business success and sustainability. This research shows that businesses and ecosystems achieving coordinated development across all four layers are more successful and sustainable.

The most important insight of the MLVC principle is that economic value creation alone is insufficient for success in modern commerce. Businesses must also build social trust, digital network effects, and systemic stability. This multi-stakeholder, multi-layered approach is the key to sustainable commerce models in the digital age.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

In the Indian context, the MLVC principle is particularly relevant as it can accommodate the country's diversity, bridge formal and informal sectors, and integrate social inclusion with technical innovation. The success of UPI, ONDC, and India Stack is proof that India is not only developing new models of digital commerce but also creating new principles of commerce.

This research makes significant contributions to the fields of commerce theory, business strategy, and digital economics. Future research can further develop the MLVC principle, apply it in new contexts, and develop policies and educational programs based on it.

Finally, the MLVC principle is not just a theoretical concept but also a roadmap for building a better, more inclusive, and sustainable commerce system in the digital age. As the global economy becomes increasingly digital and interconnected, principles like MLVC will provide essential intellectual tools for understanding and navigating new realities of commerce.

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(Additional References: RBI Annual Reports, NITI Aayog Documents, UPI Technical Documents, ONDC Protocol Specifications, India Stack Architecture Documents)

Appendix

Appendix A: MLVC Index Calculation Method

MLVC Index = 0.25 × (Physical Index) + 0.25 × (Digital Index) + 0.30 × (Social Index) + 0.20 × (Systemic Index)

Each index is measured on a 0-100 scale, where 100 is the maximum possible score.

Appendix B: Research Interview Questionnaire

1. How is value created in your business/platform?
2. How do different stakeholders (customers, employees, partners, society) contribute to value creation?
3. How do you measure and manage non-economic forms of value (trust, reputation, data)?
4. How does your business contribute to long-term sustainability?
5. How has digital transformation changed your value creation model?

Appendix C: Survey Questionnaire (Brief)

1. Business Profile: Industry, size, location, age
2. Physical Layer Metrics: Revenue growth, profit margin, cost efficiency

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 582-594

3. Digital Layer Metrics: Digital presence, data usage, network effects
4. Social Layer Metrics: Customer satisfaction, employee engagement, community impact
5. Systemic Layer Metrics: Regulatory compliance, partner network, long-term planning
6. Overall Performance: Market share, competitiveness, innovation capacity

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