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**BRIDGING WORLDS : INTERDISCIPLINARY PERSPECTIVES IN
COMMERCE, CULTURE AND LANGUAGE**

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Bridging the Digital Frontier: Interdisciplinary Perspectives on Cyber Security Frameworks and Data Science in Global Commerce**Author: Rahulkumar Malubhai Prajapati****Assistant Professor, Department of Computer Science, Narsinhbhai Patel College of Computer Studies and Management (NPCCSM), Kadi****1. Introduction:****1.1 Overview of Global Digital Commerce:**

The landscape of international trade has undergone a seismic shift, transitioning from traditional physical exchanges to a hyper-connected digital ecosystem. This evolution, often referred to as the "digital era" of commerce, is characterized by the seamless flow of data, services, and capital across borders. Today, global commerce is no longer restricted by geographical proximity; instead, it operates through complex digital networks that facilitate instant transactions. This shift has democratized market access, allowing small-scale enterprises such as those in rural and economically backward areas like Santalpur and Radhanpur to participate in the global economy. However, this rapid digitization also means that economic stability is now inextricably linked to the robustness of the underlying technological infrastructure.

1.2 The Convergence of Tech and Trade:

In this modern business environment, Data Science and Cyber Security have emerged as the dual backbones of sustainable trade. Data Science provides the analytical power to interpret vast amounts of consumer information, allowing businesses to predict market trends, optimize supply chains, and personalize the customer experience through statistical reasoning and visualization. Simultaneously, Cyber Security acts as the essential shield that protects these digital assets. As commerce operates within intricate cultural and linguistic frameworks, technical security protocols such as advanced encryption and multi-factor authentication are required to maintain the trust that is vital for international relations and economic behaviour.

1.3 Problem Statement:

Despite the benefits of digital integration, the "Digital Frontier" remains highly volatile. There is a marked increase in vulnerabilities within cross-border data flows, where sensitive commercial and personal information is exposed to sophisticated cyber threats. Traditional security models often fail because they operate in isolation, ignoring the cultural and linguistic nuances that influence how users interact with technology. There is an urgent need for robust, interdisciplinary frameworks that bridge the gap between technical defines (Computer Science) and the socio-economic realities of global trade. Without this synergy, the risk of cybercrimes ranging from data breaches to financial fraud threatens to destabilize international commerce and hinder societal development.

1.4 Objectives of the Study:

The primary objective of this research is to evaluate the critical synergy between technical security frameworks and economic stability within global commerce. Specifically, the study aims to

analyse how Cyber Security Frameworks (CSF) can be adapted to secure interdisciplinary trade environments while exploring the role of Data Science in providing predictive insights and maintaining data privacy. Furthermore, the study seeks to propose a model that integrates technical expertise with the linguistic and cultural perspectives necessary for a holistic understanding of societal development, particularly in alignment with NEP 2020 goals for promoting interdisciplinary research.

2. Literature Review and Thrust Areas:

2.1 Current Trends in Cyber Security: Analysis of Cryptographic Protocols and Threat Detection:

The contemporary landscape of digital security has shifted from static perimeter defines to dynamic, intelligence-driven models. Current literature emphasizes the critical role of "Law and Cyber Crime" as a core research area, reflecting the increasing sophistication of global digital threats. Modern cryptographic protocols are no longer just about encryption; they involve multi-layered authentication and Zero Trust Architectures (ZTA) that assume every network request is a potential breach. Research in this thrust area focuses heavily on AI-driven threat detection, where machine learning algorithms identify anomalies in financial transactions and communication patterns in real-time. This proactive approach is essential for maintaining the integrity of global business communication, particularly as cyber threats become more cross-border in nature. The Knowledge Consortium of Gujarat (KCG) specifically promotes this level of advanced research for faculties to ensure that academic knowledge stays ahead of emerging digital crimes.

2.2 Data Science in Commerce: Role of Predictive Analytics and Big Data in Global Market Trends:

Data Science has become the primary engine driving "Commerce and Management" and "Globalization and International Trade" in the 21st century. The integration of "Data Interpretation, Statistical Reasoning & Visualization" allows businesses to transform raw transactional data into actionable market intelligence. Predictive analytics, a subset of big data research, enables corporations to forecast consumer demand and identify economic shifts with unprecedented accuracy. By leveraging historical data, researchers can model complex scenarios for international trade, optimizing supply chains and reducing financial risks. In the context of the seminar's goal to bridge worlds, data science serves as the technical bridge that connects local economic behaviour with global market realities, providing a scientific basis for understanding how commerce operates within different geographical and digital frontiers.

2.3 The Interdisciplinary Gap: Technical Expertise vs. Cultural and Linguistic Nuances:

A significant gap exists in current research where technical experts often overlook the "intricate cultural and linguistic frameworks" that govern international commerce. While computer science provides the tools for trade, "Literature, Culture and Language" provide the context in which those tools are used. For instance, the role of English remains pervasive in global business communication, yet traditional languages like Gujarati and Sanskrit continue to inform

contemporary cultural practices and economic behaviour. Technical frameworks must, therefore, be designed with a "holistic understanding of societal development". Recognizing that commerce is not just a series of data points but a cultural exchange allows for the development of more inclusive and effective digital tools. Bridging this gap is central to "NEP 2020-Aligned Pedagogy & Research," which encourages scholars from humanities and linguistics to work alongside computer scientists to uncover novel insights into the interplay between economic realities and cultural heritage.

3. Interdisciplinary Frameworks for Global Commerce:

The structural foundation of this research is built upon the "Bridging Worlds" philosophy, which posits that modern trade is not merely a financial transaction but an interdisciplinary convergence of commerce, culture, and language. Within the thrust area of "Computer Science, IT, Data Science and Cyber Security," an interdisciplinary framework serves as the architecture that allows economic realities to coexist with technological advancement. As commerce operates within intricate cultural and linguistic frameworks, the design of technical systems must reflect a holistic understanding of societal development. This section details the integration of advanced computational models with commercial requirements, ensuring that the "Digital Frontier" is both productive and secure.

3.1 Cyber Security Frameworks (CSF):

A comprehensive Cyber Security Framework (CSF) is essential for mitigating risks in a globalized world where "Law and Cyber Crime" present evolving challenges. An interdisciplinary CSF transcends traditional IT security by incorporating "Cognitive Behavioural Sciences" to understand human factors in security breaches. By aligning security protocols with international relations and human rights, businesses can ensure that their data protection strategies are ethically grounded and globally compliant. These frameworks provide a systematic approach for organizations to identify vulnerabilities and protect intellectual property, which is vital for the "Promotion of Research for Faculties" and the growth of institutional knowledge.

3.1.1 Preventive Measures: Firewalls, Encryption, and Multi-Factor Authentication:

Preventive measures represent the proactive shield in the "Bridging Worlds" seminar's vision of secure international trade. In the domain of "Computer Science and IT," firewalls serve as the primary perimeter defines, filtering digital traffic between the local network and the global internet to prevent unauthorized access. Modern firewalls utilize deep packet inspection to detect malicious signatures embedded in data packets, acting as a critical barrier against cyber-attacks that could disrupt "National and International Economics". For academic and commercial institutions alike, these tools are indispensable for maintaining the integrity of digital campuses and marketplaces. Encryption is the cornerstone of privacy in a world where English often dominates global business communication, yet sensitive data may involve diverse cultural identities. By employing cryptographic protocols, sensitive information is rendered unreadable to unauthorized parties, ensuring that "Culture and Language" data remains private during transmission. This is particularly

relevant when protecting research data or commercial secrets in "Globalization and International Trade". Furthermore, Multi-Factor Authentication (MFA) adds a necessary layer of verification by requiring users to provide multiple forms of evidence before accessing critical "Education and ICT" resources. MFA significantly reduces the risk of identity theft, which is a growing concern in the implementation of digital-first initiatives like those proposed in "NEP 2020 Policy Research".

3.1.2 Detective Measures: AI-Driven Anomaly Detection in Financial Transactions:

Detective measures provide the critical secondary layer of defines by identifying threats that have penetrated the initial preventive barriers. Within the specialized area of "Data Interpretation, Statistical Reasoning & Visualization," Artificial Intelligence (AI) has revolutionized how anomalies are identified in massive datasets. AI-driven systems analyse patterns in financial transactions to detect deviations from the norm, such as unusual spending behaviour or unauthorized access from foreign IP addresses. This application of "Computer Science and Data Science" is essential for securing "International Trade" and preventing financial fraud that can destabilize local economies.

By leveraging machine learning algorithms, these systems "bridge" the gap between raw data and actionable security intelligence. These algorithms are trained on historical data to understand "National and International Economics" trends, allowing them to flag suspicious activities in real-time. This detective capability is vital for a "holistic understanding of societal development," as it protects the financial assets of both individuals and large-scale institutions. For researchers, exploring these AI models aligns with "Promotion of Research" goals, as it pushes the boundaries of how "Statistical Reasoning" can be applied to solve complex security problems in a globalized commerce environment.

3.2 Data Science Applications:

Data Science provides the analytical lens through which the complex "Bridging Worlds" interconnections are understood. It involves the synthesis of "Computer Science, IT, Data Science and Cyber Security" to extract value from information. In an interdisciplinary context, Data Science acts as a catalyst for "Innovation, Start-ups, and Social Entrepreneurship Research," enabling evidence-based decision-making that respects cultural heritage while driving economic growth.

3.2.1 Statistical Reasoning in Trade: Data Visualization for Market Shifts:

"Statistical Reasoning & Visualization" are fundamental to interpreting the rapid shifts in the "Digital Frontier". Data visualization tools allow commercial leaders to transform abstract "Data Science" outputs into intuitive graphs and charts that reveal international market trends. By visualizing these shifts, businesses can adapt to changes in "Global Economics" more effectively. This technical capability ensures that commerce operates efficiently within its "intricate cultural and linguistic frameworks," as visual data often transcends language barriers, facilitating clearer communication between global trade partners.

3.2.2 Consumer Behaviour Analytics: Linguistics and Culture in Data Patterns:

The most profound application of Data Science in this seminar's context is the analysis of how "Linguistics and Culture" influence digital data patterns. Recognizing that "commerce operates within intricate cultural frameworks," consumer behaviour analytics uses "Data Science" to decode how traditional values inform modern economic behaviour. For example, the pervasive role of "English in global business" is analysed alongside how "traditional languages like Gujarati and Sanskrit inform contemporary cultural practices". By applying "Cognitive Behavioural Sciences," researchers can understand the "profound interconnections" between a consumer's cultural background and their digital footprint. This interdisciplinary approach provides "novel insights into the dynamic interplay between economic realities and cultural heritage," which is a core goal of this international seminar.

4. Case Studies and Regional Perspectives:**4.1 Implementation of NEP 2020 in Technical Research: Promoting Interdisciplinary Studies in Computer Science:**

The National Education Policy (NEP) 2020 serves as a transformative blueprint for higher education, emphasizing the breaking down of silos between distinct academic streams. In the field of Computer Science, this policy translates into a shift from purely technical training to an "Interdisciplinary Perspective" where technology is applied to solve societal, linguistic, and economic problems. Academic institutions are now encouraged to promote research that bridges "Computer Science, IT, Data Science" with "Social Sciences" and "Humanities". For a researcher in Computer Science, this means developing technical frameworks that are not just efficient but are also culturally and linguistically sensitive. By fostering "Promotion of Research for Faculties," the Education Department of Gujarat, through the Knowledge Consortium of Gujarat (KCG), aims to create a "holistic understanding of societal development". This case study highlights how the technical curriculum can integrate "NEP 2020-Aligned Pedagogy" to prepare students for a globalized world where commerce and technology operate within "intricate cultural frameworks".

4.2 The "Radhanpur to Global" Model: Rural Entrepreneurship and Secure Digital Tools:

The second case study focuses on the specific geographical and economic context of Radhanpur and its surrounding rural areas. The "Radhanpur to Global" model examines how rural entrepreneurship can be empowered by leveraging "secure digital tools". Despite being in an "economically and educationally backward area," the digital revolution allows local businesses to reach international markets effectively "Bridging Worlds". However, for this model to be sustainable, it must be supported by robust "Cyber Security Frameworks" that protect local entrepreneurs from "Cyber Crime". By implementing "ICT" in commerce, local start-ups can utilize "Data Science" for "Statistical Reasoning" to understand international market shifts. This model demonstrates that with the right technical infrastructure and "Innovation," rural regions can overcome geographical barriers and contribute to "Global Economics". The efforts of institutions like Shri Trikamjibhai Chatwani Arts & J.V. Gokal Trust Commerce College illustrate how

providing "training in computers and modern technology" to underprivileged students creates a direct path from local talent to global impact.

5. Challenges and Ethical Considerations:

5.1 Data Privacy vs. Transparency: Balancing Security with User Accessibility:

The advancement of "Computer Science, IT, Data Science and Cyber Security" presents a significant ethical dilemma in the tension between data privacy and system transparency. While robust "Cyber Security Frameworks" are essential to protect sensitive commercial and personal information, overly restrictive security protocols can inadvertently create barriers to "user accessibility," hindering the democratization of information. For academic institutions and commercial enterprises, the challenge lies in implementing encryption and authentication measures that do not impede the "Promotion of Research" or the seamless flow of international trade. Achieving a "holistic understanding of societal development" requires a balanced approach where technical defines mechanisms are transparent enough to foster user trust while remaining resilient enough to prevent unauthorized exploitation.

5.2 Cyber Crimes in International Relations: Legal Complexities of Cross-Border Data Breaches:

As commerce transcends national boundaries, the legal landscape surrounding "Law and Cyber Crime" becomes increasingly fragmented and complex. Cross-border data breaches often involve multiple jurisdictions, making it difficult to establish accountability and enforce "Human Rights and International Relations" standards. These "legal complexities" pose a threat to the stability of "Globalization and International Trade," as a breach in one region can have cascading economic effects across the globe. This interdisciplinary challenge necessitates a dialogue between legal scholars and technical experts to develop unified international frameworks that address "Cyber Crime" while respecting the sovereignty and linguistic diversity of the nations involved.

6. Conclusion and Future Scope:

6.1 Summary of Findings:

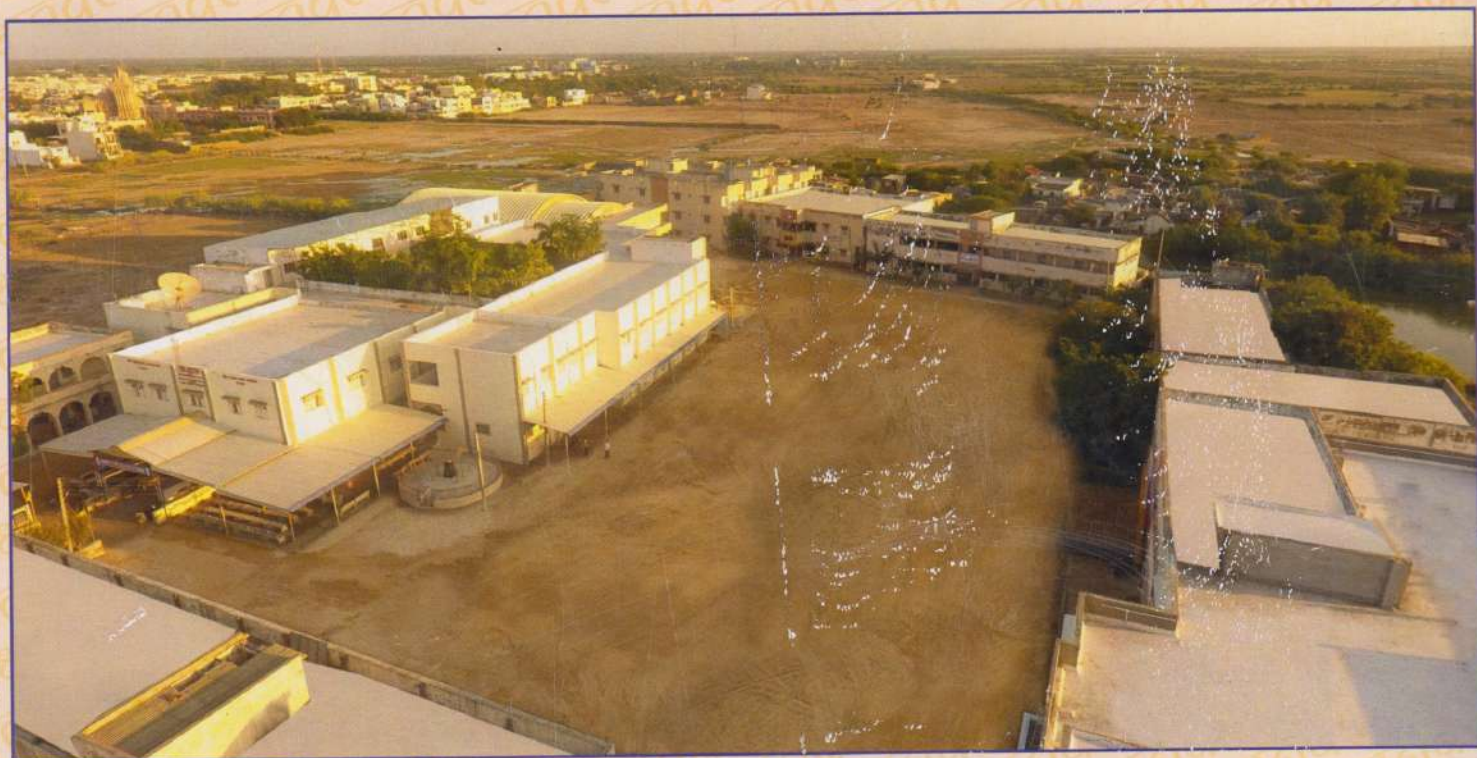
The research concludes that technology, specifically the integration of Cyber Security Frameworks and Data Science, serves as the vital bridge across the digital frontier of global commerce. These interdisciplinary tools enable secure, data-driven international trade while respecting the intricate cultural and linguistic frameworks inherent in global business communication. By synthesizing technical defines with an understanding of socio-economic realities, businesses can achieve sustainable stability and foster holistic societal development from local to global levels.

6.2 Future Directions:

The future of international trade will be increasingly defined by emerging technologies such as Blockchain and Quantum Computing. These advancements offer superior security and transparency, further bridging gaps in the global market. Future research must continue to align these technical innovations with NEP 2020 implementation studies to ensure that technical education remains interdisciplinary, inclusive, and culturally grounded for the modern workforce.

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:: VISION ::

To spread qualitatively equipped higher education along with vocational literary and humanitarian values through this institution. It also aims at keeping pace with the global challenges of the future building citizens who contribute in the motion of the creation of a secular nation and there by establish its distinctive identity.

:: MISSION ::

- To provide ample opportunities of the best education in the fields of literature and commerce along with the overall development of the intellectual, physical and mental units of the youths of such socially, educationally, economically, backward and boarder area.
- To inculcate professional commitment, highest moral values and implant such human values that will enable them to achieve the efficiency as an ideal citizen of the nation and to equip them to face the challenges of the future by providing structural facilities to achieve research targets through this institution.
- To empower girls education along with social, cultural and natural values and developing leadership qualities to care a distinctive personality in the society through the means of this institution.

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CERTIFICATE

This is to certify that Prof. / Dr. / Mr. / Mrs. / Ms. **RAHULKUMAR MALUBHAI PRAJAPATI**
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has actively participated and presented a research paper on

“ BRIDGING THE DIGITAL FRONTIER: INTERDISCIPLINARY PERSPECTIVES ON CYBER SECURITY FRAMEWORKS AND DATA SCIENCE IN GLOBAL COMMERCE ”

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His/Her active participation in the deliberation of the seminar is appreciated.

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