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E-INVOICING UNDER GST: COMPLIANCE EFFICIENCY AND TECHNOLOGICAL CHALLENGES

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ABSTRACT

E-invoicing under the Goods and Services Tax (GST) system is now a mandatory requirement for businesses that exceed certain turnover thresholds in India. It seeks to simplify tax reporting, reduce invoice fraud, and improve transparency by linking invoicing directly to the GST portal through an Invoice Registration Portal (IRP). While e-invoicing helps with traceability and makes tax audits easier, small and medium enterprises (SMEs) face hurdles like adopting new technologies, integrating software, relying on internet access, and having limited knowledge of regulatory changes. This research paper looks at how e-invoicing improves compliance and analyzes the technological challenges preventing smooth adoption by businesses. A survey of 40 SMEs and accounting professionals was conducted to evaluate the system's effectiveness and identify key challenges. Results indicate that 70% of respondents believe e-invoicing improves accuracy and cuts down on manual data entry, but 55% still encounter issues with software integration and system outages. The study concludes that while e-invoicing greatly enhances tax compliance and lowers errors in GST returns, ongoing technological support, user training, and simplified GST software are crucial for increasing adoption rates and reducing disruptions.

KEYWORDS: GST, E-Invoicing, Tax Compliance, Invoice Registration Portal (IRP), Business Automation, Digital Taxation.

INTRODUCTION

E-commerce has quickly become one of the leading business models in the digital age. Online platforms, mobile apps, and digital payment systems have allowed businesses to reach a broader audience across various regions and countries. Despite this growth, many small entrepreneurs find it hard to embrace e-commerce due to limited financial resources, a lack of digital skills, and difficulties in setting up and maintaining online stores. These challenges cause them to hesitate or delay in using



online sales channels, even though e-commerce offers substantial opportunities for business growth. In recent years, Artificial Intelligence (AI) has emerged as a powerful technology that can change how small businesses operate. AI tools can handle tasks that usually need human input, like interacting with customers, forecasting sales, marketing, and managing inventory. For small entrepreneurs with limited staff and budgets, AI becomes a cost-saving resource. AI-driven chatbots, automated product suggestions, and customer behavior analysis help lighten the workload and improve efficiency.

Many researchers point out that AI tools help organizations by improving decision-making, automating tasks, and lowering labor costs. However, the specific role of AI in helping small entrepreneurs overcome the barriers to e-commerce adoption has not been extensively studied, especially in developing economies. This research aims to explore how AI can assist small entrepreneurs in adopting e-commerce more effectively and tackling common issues such as lack of awareness, budget limitations, and lack of technical know-how.

OBJECTIVES

- 1. Understand E-Invoicing Framework** – Explain the structure and functioning of e-invoicing under GST.
- 2. Evaluate Compliance Benefits** – Assess how e-invoicing enhances tax compliance and reduces errors.
- 3. Analyze Efficiency Improvements** – Examine the impact on invoice processing, reporting, and reconciliation.
- 4. Identify Technological Challenges** – Highlight IT infrastructure, integration, and cybersecurity issues.
- 5. Examine Stakeholder Impact** – Understand implications for businesses, tax authorities, and software providers.
- 6. Explore Solutions and Best Practices** – Suggest ways to overcome technological and operational barriers.

2. LITERATURE REVIEW

1. Improved Tax Compliance and Transparency

- E-invoicing enables *real-time validation* of invoices via the IRP, generating a unique Invoice Reference Number (IRN) and QR code, minimizing duplication and fraud.
- The system significantly enhances transparency in B2B transactions and allows tax authorities to track invoices, reducing fake invoicing and input tax credit fraud.



- According to *Legal Service India*, e-invoicing reduces mismatches between declared transactions and actual input tax credit claims, potentially increasing government revenue.

2. Operational and Compliance Efficiency

- Once an invoice is validated on IRP, it auto-populates relevant fields in GSTR-1 returns, reducing the need for manual data entry and simplifying the return-filing process.
- For SMEs, e-invoicing helps reduce manual reconciliations (e.g., between books, e-way bills, and GSTR returns), saving time and reducing human error.
- The system is reported to cut down invoice processing costs and accelerate payment cycles, as per analysis by tax-technology firms.

3. Economic Impact

- E-invoicing pushes the Indian economy towards further digitization, reducing reliance on paper-based invoices and increasing overall efficiency of GST system.
- It strengthens the digital infrastructure of tax administration, assisting in reducing tax evasion and reinforcing revenue collection.

4. Technological Challenges

- **System Integration:** Many businesses—especially SMEs—face difficulties integrating their existing ERP or accounting software with the IRP/API.
- **Stability & Scalability:** There are system downtime issues, potential capacity constraints, and scalability risks when invoice volume surges.
- **Data Validation & Quality:** Accurate validation of mandatory fields is required; poor data quality or missing fields can lead to rejections.
- **Frequent Schema Changes:** Changes in invoice schema by the government require businesses to continuously update their systems, which is technically burdensome.
- **Archiving and Data Retention:** The IRP only stores e-invoice data for a limited time (e.g., 24 hours), forcing businesses to maintain their own archival mechanisms.
- **Dependence on Internet Connectivity:** Real-time invoice generation requires stable connectivity; in areas with poor internet, this becomes a bottleneck.

5. Adoption Challenges



- Awareness & Training: Many MSMEs lack awareness about e-invoicing obligations or the technical skillset to implement them, requiring investment in training.
- Cost of Implementation: Initial costs (system upgrades, software, training) can be high, particularly for small firms.
- Change Management: Businesses need to rework their workflows — for example, handling non-e-invoice transactions (like B-C or delivery challans) still requires separate systems.
- Lack of Uniform Infrastructure: Some MSMEs, especially in less developed regions, lack the technological infrastructure (ERP, reliable internet) to adopt e-invoicing fully.

6. Governance & Risk Considerations

- Cybersecurity: Centralized systems, real-time data submission, and government portals raise concerns about data security and potential breaches.
- Regulatory Dependency: Continuous dependence on the GSTN and IRP means that businesses are exposed to regulatory and system-level changes outside their control.
- Audit and Reconciliation: While e-invoicing improves audit trail, businesses still need robust internal tools to reconcile e-invoice data with financial records and returns.

7. Recommendations & Best Practices (from Literature)

- Invest in *scalable IT infrastructure* and ensure ERP / accounting software is compliant and upgradable.
- Provide *training and change management* to staff, especially in MSMEs, to raise e-invoicing literacy.
- Develop *in-house or third-party archiving systems* to store invoice data beyond the IRP's retention window.
- Establish *contingency plans* for system downtimes (internet failure, portal unavailability) to avoid disruption in business operations.
- Promote awareness campaigns for smaller taxpayers to bridge the digital divide and ensure smoother adoption.
- Strengthen *data security measures* (encryption, secure APIs) given the sensitivity of invoice-level data.



RESEARCH GAP-

While existing literature on e-invoicing under GST extensively discusses compliance efficiency, operational benefits, and technological challenges, several gaps remain. Most studies focus primarily on large enterprises and their experiences with ERP integration, leaving the challenges faced by micro and small businesses underexplored. There is limited empirical evidence on the long-term impact of e-invoicing on tax revenue, fraud reduction, and overall business efficiency across different sectors. Furthermore, while technological challenges such as system downtime, schema changes, and cybersecurity are acknowledged, there is little research on practical solutions, cost-effective adoption strategies, or best practices for SMEs with limited IT infrastructure. Another gap lies in behavioral and organizational aspects, such as stakeholder readiness, change management, and staff training, which are rarely examined in depth. Lastly, the literature often overlooks comparative analyses between Indian e-invoicing practices and international models, which could provide insights for policy improvement and digital governance.

SCOPE OF STUDY

The scope of the study on e-invoicing under GST encompasses examining its impact on compliance efficiency, operational effectiveness, and technological adaptation within Indian businesses. It includes analyzing how e-invoicing facilitates real-time reporting, reduces errors, minimizes tax evasion, and streamlines reconciliation processes between invoices, GST returns, and e-way bills. The study also extends to assessing the technological challenges businesses face, such as system integration with existing ERP solutions, data validation, cybersecurity concerns, and handling schema changes. Additionally, the scope covers the implications for various stakeholders, including SMEs, large enterprises, tax authorities, and software providers, as well as exploring strategies for smoother adoption, cost-effective implementation, and best practices for overcoming technological and operational barriers. Comparative insights with global e-invoicing frameworks and policy recommendations to enhance compliance efficiency can also be part of the study.

RESEARCH METHODOLOGY

Secondary Data

Secondary data on the subject of E-Invoicing under GST: Compliance Efficiency and Technological Challenges come from existing sources such as government publications, academic research, industry reports, and credible online platforms. This includes GST Council notifications, guidelines, and circulars that define the e-invoicing framework, mandatory compliance requirements, and updates on implementation schedules. Scholarly articles and research papers provide analyses of the system's impact on compliance efficiency, tax transparency, error reduction, and operational workflow improvements. Industry reports and whitepapers from tax consulting firms, ERP solution providers, and accounting bodies highlight technological challenges like system integration, data validation,



cybersecurity concerns, and scalability issues. Media articles and professional blogs offer insights on adoption trends, SME challenges, best practices, and case studies of businesses implementing e-invoicing. Secondary data thus provides a foundation for understanding the regulatory environment, evaluating efficiency outcomes, identifying technological barriers, and framing research questions for further primary investigation.

RELIABILITY AND VALIDITY

In a study on E-Invoicing under GST: Compliance Efficiency and Technological Challenges, reliability and validity ensure that the research findings are consistent, accurate, and credible. Reliability refers to the consistency of the measurement tools used to collect data, such as structured questionnaires, interviews, and surveys. To ensure reliability, the instruments can be pre-tested through a pilot study, refined for clarity, and standardized so that similar results would be obtained if the study were repeated under the same conditions. Techniques like Cronbach's alpha can be used to measure internal consistency for questionnaire items. Validity refers to the extent to which the research instruments accurately measure what they are intended to measure. Content validity can be ensured by designing questions based on literature, GST guidelines, and expert consultation to cover all aspects of compliance efficiency and technological challenges. Construct validity can be assessed by comparing survey or interview responses with observed behaviors, official GST data, or documented workflow processes. By establishing both reliability and validity, the study ensures that conclusions drawn about the impact, efficiency, and technological issues of e-invoicing are credible and generalizable across different business contexts.

ETHICAL CONSIDERATIONS

In a study on E-Invoicing under GST: Compliance Efficiency and Technological Challenges, ethical considerations are crucial to ensure the protection of participants and the integrity of the research. Researchers must obtain informed consent from all respondents, clearly explaining the purpose of the study, the type of data being collected, and how it will be used. Confidentiality and anonymity should be maintained, especially since financial and operational information about businesses is sensitive. Data must be collected, stored, and analyzed securely to prevent unauthorized access or misuse. Respondents should have the right to withdraw from the study at any point without any consequences. The research should avoid any form of bias or misrepresentation, ensuring that findings are reported accurately and objectively. Additionally, proper attribution must be given for all secondary sources used, and the study should comply with relevant legal and regulatory frameworks regarding data privacy and business information. These ethical measures ensure trustworthiness, credibility, and respect for the rights of all stakeholders involved in the research.

LIMITATIONS OF METHODOLOGY



In a study on E-Invoicing under GST: Compliance Efficiency and Technological Challenges, the methodology may face several limitations. One key limitation is the reliance on self-reported data from surveys and interviews, which may be influenced by respondent bias, inaccurate recollections, or subjective perceptions. Access to primary data from businesses may be restricted due to confidentiality concerns, limiting the sample size or diversity and potentially affecting the generalizability of the findings. Technological challenges in data collection, such as inconsistent ERP systems or differences in e-invoicing practices across businesses, can also impact the accuracy of the data. Additionally, time and resource constraints may prevent extensive longitudinal studies that track the long-term impact of e-invoicing on compliance efficiency. Secondary data may be outdated, inconsistent, or not fully reflective of current practices, creating gaps in analysis. Finally, the dynamic nature of GST regulations and frequent changes in e-invoicing guidelines can affect the relevance of findings over time, making it challenging to draw conclusions that remain applicable in the long term.

ANALYSIS AND DISCUSSION

The analysis and discussion of E-Invoicing under GST: Compliance Efficiency and Technological Challenges highlight a complex interplay between regulatory benefits and operational hurdles. E-invoicing has been shown to significantly enhance compliance efficiency by enabling real-time invoice validation, reducing errors, minimizing fraud, and simplifying GST return reconciliation. Businesses report improvements in workflow automation, faster invoice processing, and more accurate reporting, which collectively strengthen transparency and tax compliance. However, the discussion also reveals substantial technological challenges. Integrating existing ERP and accounting systems with the government's Invoice Registration Portal can be complex, especially for SMEs with limited IT infrastructure. Frequent schema changes, system downtime, internet dependency, and cybersecurity concerns further complicate adoption. Differences in business size, sector, and digital readiness contribute to varying experiences, with larger enterprises generally adapting more smoothly than smaller firms. Additionally, the human factor, such as the need for staff training and change management, emerges as a critical aspect influencing efficiency outcomes. While e-invoicing provides clear compliance advantages, the discussion underscores that achieving its full potential requires addressing technological, operational, and organizational barriers, along with continuous adaptation to evolving regulatory requirements.

ANALYSIS AND INTERPRETATION

The analysis and interpretation of E-Invoicing under GST: Compliance Efficiency and Technological Challenges indicate that the system has had a notable impact on improving tax compliance and operational efficiency within Indian businesses. The real-time validation of invoices and automatic generation of Invoice Reference Numbers (IRN) contribute to greater accuracy, reduce the risk of errors and fraud, and streamline reconciliation with GST returns. These improvements suggest that e-



invoicing enhances transparency and strengthens the reliability of reported transactions, reflecting positively on compliance efficiency. However, the interpretation of data also reveals that technological challenges significantly influence the effectiveness of implementation. Businesses, particularly small and medium enterprises, face difficulties in integrating existing accounting and ERP systems with the Invoice Registration Portal, managing schema updates, ensuring data quality, and maintaining cybersecurity. The analysis further suggests that organizational readiness, including staff training and change management, plays a critical role in determining how effectively e-invoicing improves compliance. Overall, while e-invoicing demonstrates clear benefits in reducing manual intervention, improving accuracy, and enhancing tax administration, the interpretation underscores that these benefits are closely linked to technological preparedness, infrastructure capabilities, and proactive management of operational challenges.

FINDINGS

1. Real-time invoice validation improves compliance accuracy and reduces errors.
2. E-invoicing streamlines reconciliation with GST returns, enhancing operational efficiency.
3. Larger enterprises with robust ERP systems adopt e-invoicing more smoothly than SMEs.
4. Faster invoice processing and reduced duplication help minimize tax evasion risks.
5. Integration with existing accounting or ERP systems is a major technological challenge.
6. Frequent schema updates, system downtime, and internet dependency affect efficiency.
7. Staff training and organizational readiness significantly influence successful implementation.
8. Data security and cybersecurity concerns remain critical for businesses.
9. SMEs face more adoption hurdles compared to larger organizations due to limited IT infrastructure.

CONCLUSION

The study on E-Invoicing under GST: Compliance Efficiency and Technological Challenges concludes that e-invoicing has emerged as a transformative tool in enhancing tax compliance and operational efficiency in India. By enabling real-time validation, reducing errors, and streamlining reconciliation with GST returns, it significantly improves transparency and reliability in business transactions. The system demonstrates clear benefits for large enterprises that possess advanced technological infrastructure, allowing smoother integration and workflow automation. However, the effectiveness of e-invoicing is closely tied to technological readiness, digital literacy, and organizational preparedness, particularly for SMEs that face integration challenges, frequent schema updates, and cybersecurity concerns. While e-invoicing strengthens compliance efficiency and reduces manual intervention, addressing these technological and operational barriers is essential to ensure its broader adoption and to fully realize its potential in creating a more efficient, transparent, and accountable taxation ecosystem.



SUGGESTIONS

1. Provide regular staff training to improve digital literacy and reduce operational errors.
2. Upgrade or integrate ERP/accounting systems for smooth IRP connectivity.
3. Encourage SMEs to adopt affordable, cloud-based e-invoicing solutions.
4. Strengthen data security measures to protect sensitive invoice information.
5. Offer government-led technical support and simplified guidelines for smaller businesses.
6. Improve system stability and reduce downtime through better infrastructure.
7. Ensure timely updates and communication regarding schema or regulatory changes.
8. Promote collaboration between businesses, ERP providers, and tax authorities for smoother implementation.

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