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 ISSN: 2582-6433

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 ISSN: 2582-6433

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 ISSN: 2582-6433

‘DIGITAL SIGNATURES – LEGAL RECOGNITION, APPLICABILITY ANDCHALLENGES UNDER THE INFORMATION TECHNOLOGY ACT, 2000’

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ABSTRACT

The digital age has transformed how we conduct business, communicate, and handle legal matters. Among the innovations, digital signatures have become essential for verifying the authenticity and integrity of electronic documents. Unlike traditional handwritten signatures, digital signatures use cryptographic techniques to securely sign documents electronically. This paper delves into what digital signatures are, how they differ from electronic signatures, and their legal recognition under the Information Technology Act, 2000.

Also, this paper outlines how digital signatures are created, issued, and validated, emphasizing their advantages over simpler electronic signatures. However, the implementation of digital signatures comes with its own set of challenges, including cross-border issues, security concerns,and the need for standardization. The paper also reviews relevant case laws that highlight the growing importance of digital signatures in India’s legal framework.

While digital signatures offer a secure and reliable method for handling electronic transactions, ongoing efforts are needed to address these challenges and ensure that our legal and technical systems keep up with advancements. By tackling these issues, India can strengthen its digital economy and make electronic transactions more trustworthy.

 ISSN: 2582-6433

SCOPE AND OBJECTIVE OF THE STUDY

- To understand what digital signatures are, how they differ from electronic signatures in accordance with the Information Technology Act, 2000.
- To study how the digital signatures are created, who can issue digital signature certificate and their validity under the legal framework of India.
- To study the procedure for issuance of a digital signature certificate and legal provisions concerning digital signatures under Information Technology Act, 2000.
- To highlight the Judicial Interpretation.

1. Introduction

The digital revolution has fundamentally transformed the way we conduct business, communicate, and engage in legal transactions. Among the many technological advancements, digital signatures have emerged as a critical tool for ensuring the authenticity, integrity, and non- repudiation of electronic documents and communications. A digital signature is a cryptographic technique that provides a secure and verifiable way to sign documents electronically, thus replacing traditional handwritten signatures. This technology has been increasingly adopted across various sectors, including finance, healthcare, legal services, and government operations.

Despite the apparent benefits, the implementation of digital signatures is not without challenges. These challenges range from technical issues, such as ensuring interoperability and security, to legal and regulatory hurdles, such as cross-border recognition and compliance with varying national standards. As businesses and governments continue to adopt digital signatures, it is crucial to understand the legal frameworks that govern their use and the obstacles that may impede their effective implementation.

1.1 What is a Digital Signature?[1]

A signature is more than just a mark; it's a personal expression of one's identity. In the legal world and in everyday transactions, a signature carries a lot of weight. When you sign a document, it's your way of saying that you've read and understood everything in it, checked the details, and agreed to it with confidence.

[1] Subodh Asthana, All You Want to Know about Digital & Electronic Signature - iPleaders, Key Highlights (June 21, 2019), https://blog.ipleaders.in/digital-electronic-signature/.

 ISSN: 2582-6433

In contract law, a signature is essential because it signals that you've accepted an offer. As technology has advanced, the way we sign things has also changed. With the rise of online transactions and emails, there's also a higher risk of data being compromised. That's why online signatures have become increasingly important, so they help keep things secure in our digital world.

1.2 Difference Between Digital Signatures and Electronic Signatures:[2]

An electronic signature[3] is more about showing agreement to a document without necessarily confirming the accuracy of its content. It could be as simple as attaching an image to indicate that a party consents to the document. However, electronic signatures are more vulnerable to tampering and can be misused more easily than digital signatures. They are harder to verify in terms of time and location, and there are instances where someone else could affix the signature without it being traced.

On the other hand, digital signatures offer stronger protection and are much harder to tamper with. If any changes are made to a document and it's returned to the original signer, the digital signature will show as invalid. Unlike electronic signatures, digital signatures use a unique passkey that is shared only between the signer and the original recipient. They also provide a timestamp, which is crucial for legal disputes, as it helps prove the document's authenticity in court. Digital signatures clearly identify the individuals involved, offering a level of certainty that electronic signatures do not.

1.3 Definition of Digital Signature and Electronic Signature as stated under Information Technology Act, 2000:

- **Sec 2 (ta) of Information Technology Act 2000 defines electronic signature as:[4]** electronicsignature means authentication of any electronic record by a subscriber by means of the electronic technique specified in the Second Schedule and includes digital signature.

  In simple words, an electronic signature covers not just digital signatures, but also other electronic methods outlined in the Act. In simple terms, it means that a person is

[2] Archana Balasubramanian, Digital Signature And Electronic Signature - Legal Framework, IT and Internet (June 24, 2021), https://www.mondaq.com/india/it-and-internet/1083500/digital-signature-and-electronic-signature-legal- framework.
[3] Webtel Electrosoft Pvt. Ltd., Https://Webtel.In https://webtel.in/Blog/e-signature-laws-in-india/210.
[4] Information Technology Act, 2000, No. 21 of 2000 (India), § 2(1)(ta)

 ISSN: 2582-6433

authenticating an electronic record using electronic tools. By adopting the concept of 'electronic signature,' the Act is flexible with technology, recognizing both the digital signature method, which relies on cryptography, and other types of electronic signatures that use different technologies.

- **According to section 2(1)(p) of the Information Technology Act, 2000 digital signature means**[5] the authentication of any electronic record by a person who has subscribed for the digital signature in accordance with the procedure mentioned under section 3 of the said act.

1.4 Comparative table between Digital Signature and Electronic Signature:[6]

Feature	Digital Signature	Electronic Signature
Definition	It has been defined under Section 2(1)(p) of the Information Technology Act, 2000.	It has been defined under Section 2(1)(ta) of the Information Technology Act, 2000.
Authenticity	It has more authenticity as compared to theelectronic signature.	It is less authentic as compared to the digitalsignature.
Duration	It is valid up to a maximum of three years.	It has no expiration or validity period.
Security	It is more secure than electronic signatures.	It is less secure as compared to the digital signature.
Verification	It has a certificate-based digital10 verification.	It is verified through the signer's identity.

2. Validity of Digital Signature

The Information Technology Act, 2000 defines a digital signature as the authentication of an electronic record by a subscriber through an electronic method or procedure in line with section 3[7]. This act includes provisions to ensure the security and authenticity of electronically filed documents by using digital signatures. Section 5[8] of the Act grants legal validity to digital signatures based on asymmetric cryptography. Each digital signature

[5] Information Technology Act, 2000, No. 21 of 2000 (India), § 2(1)(p)
[6] India Filings, https://www.indiafilings.com/learn/electronic-signature/.
[7] Information Technology Act, 2000, No. 21 of 2000 (India), § 3
[8] Information Technology Act, 2000, No. 21 of 2000 (India), § 5

 ISSN: 2582-6433

functions through a Digital Signature Certificate, which includes a unique pair of private and public keys representing an individual's identity. Certification Agencies, designated by the Controller of Certifying Authority(CCA), are authorized under Section 35[9] of the IT Act, 2000 to issue these Digital Signature Certificates (DSC). Also, they are legally admissible in a court as stated in the provisions of the said Act.

2.1 How Digital Signatures are created?[10]

Digital signatures use a process called asymmetric cryptography, or public-key cryptography. In this process, two keys are created: a private key that only the person who is the signature himself knows, and a public key that can be shared with others. The digital signature itself is produced byapplying a special mathematical formula to both the content of the document and the signer's private key.

2.2 Who issues Digital Signatures?

Digital signatures are usually provided by a trusted third party known as a Certificate Authority (CA). These organizations confirm the identity of individuals or companies requesting digital signatures and issue digital certificates, which include the public key and identifying details.[11]

According to Section 24(1) of the Information Technology Act, 2000[12], no one can issue a Digital Signature Certificate unless they have been licensed to do so by the Controller.

Following Certified Authorities have been granted a license to issue DSC:[13]

- National Informatics Center (NIC)
- IDRBT Certifying Authority
- SafeScrypt CA Services, Sify Communications Ltd.
- (n) Code Solutions
- E-MUDHRA
- CDAC
- NSDL

[9] Information Technology Act, 2000, No. 21 of 2000 (India), § 35
[10] Mitesh Boral, Law of Digital Signatures in India, (Mar. 18, 2024), https://www.linkedin.com/pulse/law-digital-signatures-india-vijay-pal-dalmia-2a4fc/.
[11] legal Service India, Digital Signature Certificate, https://www.legalserviceindia.com/articles/article+8.htm.
[12] Information Technology Act, 2000, No. 21 of 2000 (India), § 24(1)
[13] https://www.mca.gov.in/MinistryV2/certifyingauthorities.html.

 ISSN: 2582-6433

- Capricorn
- Pantasign
- IDSIGN
- Verasys
- XtraTrust
- Care4Sign
- SignX
- ProDigiSign

2.3 Does any International Agency issue Digital Signature Certificate?[14]

There is no single global agency in charge of issuing digital signatures. Instead, international standards and guidelines, like those from the International Organization for Standardization (ISO), offer frameworks for implementing and ensuring compatibility of digital signature systems across various countries and regions.

2.4 On which documents is a digital signature invalid?[15]

There are certain documents where a physical signature is required through a notarial process and must be registered with the Registrar to be legally valid. According to Section 1(4) of the Information Technology Act, 2000, the Act does not cover:

- Negotiable instruments, except cheques
- Powers of Attorney
- Trusts
- Wills and other testamentary documents
- Contracts for the sale of real estate or immovable property

2.5 What is the time taken to issue a Digital Signature Certificate and what is the validity period of a Digital Signature Certificate?[16]

The certifying authorities may take around 2-3 days in issuing a DSC and the validity period of aDSC is between 1 or 2 years.

[14] (Apr. 9, 2024), https://ijarsct.co.in/Paper17031.pdf.
[15] Digital Signatory Validity in India, (Mar. 31, 2021), https://www.khuranaandkhurana.com/2021/03/31/validity-of- digital-signatures-in-india/.
[16] legal Service India, Digital Signature Certificate, https://www.legalserviceindia.com/articles/article+8.htm.

 ISSN: 2582-6433

2.6 Use of Digital Signature:[17]

When a digital signature is created, it's linked to the digital document or message. To verify it, the recipient uses the signer's public key to decrypt the signature and compare it to a value calculated from the original document. If the two values matches, the signature is deemed valid, confirming that the document hasn't been tampered with and was signed by the person holding the private key.

Examples

- **Personal Use:** Individuals have the freedom to use a digital signature for personal matters, without the need to be physically present at a specific location.
- **Business:** Professions like architecture, construction, and engineering often require signing tenders, market procurements, or bids. Digital signatures provide a convenient way to give consent in these situations.
- **GST Return Filing:** When filing GST and e-filing, individuals are required to use digital signatures.
- **Income Tax Filing:** Some businesses need to file taxes across India, and digital signatures make this process much more efficient.
- **ROC E-filing:** Filing with the Registrar of Companies and submitting various documents have made digital signatures a preferred choice for many.

3. Procedure for issuance of a Digital Signature Certificate:

According to Section 35 of information Technology Act, 2000[18], Certifying authority to issue [electronic signature] Certificate. Are:

1) Any person may make an application to the Certifying Authority for the issue of a [electronic signature] Certificate in such form as may be prescribed by the Central Government.
2) Every such application shall be accompanied by such fee not exceeding twenty-five thousand rupees as may be prescribed by the Central Government, to be paid to the Certifying Authority: Provided that while prescribing fees under sub-section (2) different fees may be prescribed for different classes of applicants.
3) Every such application shall be accompanied by a certification practice statement or

[17] Subodh Asthana, All You Want to Know about Digital & Electronic Signature - iPleaders, Key highlights (June 21, 2019), https://blog.ipleaders.in/digital-electronic-signature/.
[18] Information Technology Act, 2000, No. 21 of 2000 (India), § 35

 ISSN: 2582-6433

where there is no such statement, a statement containing such particulars, as may be specified by regulations.

4) On receipt of an application under sub-section (1), the Certifying Authority may, after consideration of the certification practice statement or the other statement under sub-section (3) and after making such enquiries as it may deem fit, grant the [electronic signature] Certificate or for reasons to be recorded in writing, reject the application:

[Provided] that no application shall be rejected unless the applicant has been given a reasonableopportunity of showing cause against the proposed rejection.

According to Section 23 of information Technology Act, 2000,[19]:

The Certifying Authority shall, for issuing the Digital Signature Certificates, while complying with the provisions of section 35 of the Act, also comply with the following, namely:-

1) The Digital Signature Certificate shall be issued only after a Digital Signature Certificate application in the form provided by the Certifying Authority has been submitted by the subscriber to the Certifying Authority and the same has been approved by it: Provided that the application Form contains, inter alia, the particulars given in the modal Form given in Schedule-IV of the said Act.
2) No interim Digital Signature Certificates can be issued, and the Certifying Authority must generate a Digital Signature Certificate only after receiving a valid request for either a new certificate or its renewal. The certificate should include information or references necessary to locate repositories that will list its suspension or revocation if applicable. The method of identity verification for the certificate must be detailed in the Certification Practice Statement and approved by the Controller during the licensing process. If a new Digital Signature Certificate is issued based on a valid existing one, andthe original is later suspended or revoked, the Certifying Authority must investigate whether the new certificate also needs to be suspended or revoked. Subscribers must be given a chance to review the certificate's contents before accepting it, and once accepted, the Certifying Authority must publish a signed copy in a repository. If any information affecting the certificate's validity arises, the Certifying Authority must notify the subscriber immediately. Additionally, all Digital Signature Certificates must

[19] Information Technology Act, 2000, No. 21 of 2000 (India), § 23

 ISSN: 2582-6433

have a designated expiration date.

3.1 Classes of DSC: There are mainly four classes of Digital Signature Certificate[20]

Class 0 Certificates are simply used for demonstration, helping to test and understand how digital signature certificates work across different types of applications.

Class 1 Certificates are provided to individuals or private subscribers and verify that the user's name and email address are uniquely identified within the Certifying Authority's database.

Class 2 Certificates are available for both business professionals and private users, ensuring thatthe subscriber's information in the application does not contradict data from reputable consumer databases.

Class 3 Certificates are offered to both individuals and organizations, providing a higher level of assurance, particularly for e-commerce purposes. These certificates require individuals to appear in person before the Certifying Authorities for issuance.

3.2 Legal Provisions Concerning Digital Signatures in India[21]:

i. **Recognition of Digital Signatures:**

Section 5 of the IT Act grants legal recognition to digital signatures. It states that when a law requires information or documents to be authenticated by a signature, this requirement is considered fulfilled if a digital signature is used, provided it follows the prescribed procedures.

ii. **Authentication of Digital Signatures:**

Under Section 15 of the IT Act, the authority responsible for authenticating a digital signature must ensure certain conditions are met before proceeding. Specifically, the prospective subscriber must have generated the key pair necessary for both creating and verifying the signature. Additionally, the subscriber must have control over the use of their private key, ensuring that only they can use it to create the digital signature.

iii. **Legal Consequences of Digital Signatures:**

Section 13 of the IT Act specifies that a digital signature is considered secure if it meets several criteria. It must be created during the validity period of a legitimate Digital Signature Certificate and verified using the public key listed in the sender's certificate. The digital signature must be unique to the subscriber who affixed it and should clearly

[20] (Nov. 1, 2018), https://www.ijlmh.com/wp-content/uploads/2019/03/Critical-Analysis-of-Digital-Signature-Laws- in-India.pdf.
[21] https://lawbhoomi.com/legal-recognition-of-digital-signature-in-india/.

 ISSN: 2582-6433

indicate the subscriber's approval of the associated information. Furthermore, it must be linked to the information in such a way that any changes to the information will invalidate the digital signature, ensuring the integrity of the document.

iv. **Representations Made by a Certifying Authority (CA) Upon Issuance of a DigitalSignature Certificate (DSC)**

Section 36 of the Information Technology Act, 2000, ensures the reliability of Digital Signature Certificates (DSCs). When issuing a DSC, the Certifying Authority (CA) makes representations regarding its compliance with the Act, the subscriber's acceptance, key possession, functional key pair, accuracy of information, and absence of material facts. These representations provide a framework for protecting the interests of both the subscriber and those who rely on the DSC.

v. **Suspension and Revocation of DSCs:**

A Digital Signature Certificate (DSC) can be suspended by the Certifying Authority (CA)under Section 37 of the IT Act if the subscriber or someone acting on their behalf requests the suspension, or if the CA believes that suspending the certificate is in the public interest.

Under Section 38 of the IT Act, a DSC may be revoked by the CA (Certifying Authority)in several circumstances: if the subscriber or their representative requests revocation, if the subscriber dies or becomes insolvent, if the subscriber (in the case of a firm or company) is dissolved or wound up, if any material fact represented in the DSC isfound to be concealed or false, if the requirements for issuing the DSC were not met, or ifthe CA's (Certifying Authority) private key or security system has been compromised.

While the section 37 and 38 deals with suspension and revocation of DSCs, section 39 of the IT Act states that when a DSC is suspended or revoked under section 37 and 38 of thesaid Act as the case may be, the Certifying Authority shall publish a notice of such revocation or suspension.

4 Issues and Challenges faced by digital signatures

Despite the existence of legal provisions that is stated in this paper, the use of digital signatures is not without challenges. One of the key issues is the jurisdictional complexity that arises in cross-border transactions. Determining the applicable law can be difficult, especially when parties are in different jurisdictions with varying legal requirements. There are still many issues that are of a concern, as stated below:

 ISSN: 2582-6433

- **Security and Privacy Concerns**

  The security and privacy of digital signatures is a critical concern. The protection of private keys, which are essential for the creation and verification of digital signatures, is paramount. Legal frameworks must address issues related to key management and compromise. Furthermore, the collection and processing of personal information associated with digital signatures raises privacy concerns. Data protection laws must be adequately implemented to safeguard individuals' privacy rights.

- **Interoperability and Standardization**

  Ensuring interoperability between different digital signature systems and platforms is essential for their widespread adoption. Standardization efforts can help promote compatibility and facilitate cross-border transactions. Legal frameworks should encourage the development of standards and guidelines for the creation and use of digital signatures.

- **Enforcement and Dispute Resolution**

  The enforceability of digital signatures in legal proceedings is another important consideration. Legal frameworks must address the admissibility of digital evidence and establish procedures for resolving disputes involving digital signatures. International cooperation and dispute resolution mechanisms can be helpful in addressing cross-border disputes.

- **Consumer Protection**

  Protecting consumers from fraud and forgery associated with digital signatures is a critical objective. Legal frameworks should include provisions to safeguard consumers' rights and interests. Education and awareness campaigns can also help consumers understand the benefits and risks of using digital signatures.

Relevant Case Laws

a) In the case of **Trimex International FZE Ltd. vs. Vedanta Aluminum Ltd. and Ors. (2010)[22],** the Delhi High Court reinforced the growing importance of digital signatures in the digital age, particularly within electronic transactions. The court affirmed that when digital signatures are used in compliance with the Information Technology Act, 2000, they carry the same legal weight as traditional handwritten signatures. This ruling highlighted the critical role digital signatures play in ensuring the authenticity, integrity,

[22] Trimex International Fze Ltd. v. Vedanta Aluminum Ltd. (2010)

 ISSN: 2582-6433

and security of electronic documents, marking a significant step in the acceptance and validation of electronic transactions in India's legal framework.

b) A landmark judgment in the realm of digital signatures is **the State of Maharashtra v. Dr. Praful B. Desai[23] (2003)** case. In this case, the Supreme Court of India affirmed the validity of digital signatures and electronic records under the Information Technology Act, 2000. Thecourt highlighted the crucial role of digital signatures in enabling secure electronic transactions and recognized them as legally valid methods of authentication. This judgment was instrumental in shaping the legal foundation for electronic commerce in India, setting a precedent for the acceptance of digital signatures in legal proceedings.

5. Conclusion

The legal recognition of digital signatures in India under the Information Technology Act, 2000, has paved the way for their widespread adoption and use in electronic transactions. Digital signatures offer a reliable and secure means to ensure the integrity, authenticity, and non- repudiation of electronic records. As digital transactions continue to grow in importance, the roleof digital signatures will only become more critical.

However, to fully realize the benefits of digital signatures, it is essential to address the challengesassociated with their secure generation and use. Measures must be taken to prevent the misuse ofdigital signatures, such as unauthorized access to private keys and the creation of forged signatures. Additionally, ongoing efforts are needed to ensure that legal frameworks and technical standards keep pace with technological advancements, particularly in areas like blockchain and quantum computing. By addressing these challenges and promoting the secure and responsible use of digital signatures, India can further strengthen its digital economy and enhance the trust and reliability of electronic transactions.

[23] State of Maharashtra v. Dr. Praful B. Desai (2003)