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Smart Contracts, Old Laws: Navigating Pakistan's Regulatory Landscape

Muhammad Fahd Amin[1, *]
1 School of Law, Quaid-i-Azam University, Islamabad
[*]Corresponding author: mfahdamin@qau.edu.pk

Abstract

This study examines the legal limitations and challenges with respect to using smart contracts within the legal system of Pakistan. In particular, it focuses on specific legislations dealing with contractual relations in Pakistan and its application to smart contracts. Employing the theoretical lens of law and technology, this study seeks to evaluate whether the current laws of Pakistan are adequate for recognizing complex blockchain smart contracts. This study adopts both doctrinal and comparative methodology to draw lessons from other jurisdictions on this particular issue. The article proposes certain legislative and policy changes to address the regulatory gaps in relation to legal recognition of smart contracts in Pakistan.

Keywords: Smart contracts, blockchain technology, self-execution, digital ledgers, specific performance, law and technology, traditional contracts, regulatory gaps
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1. INTRODUCTION

The spectacular breakthroughs of the modern technology have caused fundamental changes in all facets of life. The advancement in technology has ushered in a new era for contracts, too. The concept of 'smart contracts' is not as unique as some think. Many automated transactions in our daily life (like purchasing commodities out of a vending machine) employ smart contracts. However, the introduction of block-chain technology resulted in a major shift in the way smart contracts work.

A smart contract is basically "a computerized transaction protocol that executes the terms of contract" (Szabo, 1997). The prime distinction between a smart contract and a traditional contract is that the former relies on a self-executing agreement that does not require any intermediary for contractual performance. The supporters of smart contracts regard efficiency as the prime advantage of executing smart contracts. This efficiency is due to the fact that smart contracts are automated, reduce operational costs, offer standardization and save time (Ferreira, 2021). Furthermore, some experts believe that traditional contracts suffer from certain limitations including inconsistent judicial interpretations of contractual terms, swelled legal costs and wastage of time (Sklaroff, 2018). Thus, the technology enthusiasts and entrepreneurs present smart contracts as to remedy the ills associated with the traditional

contracts. However, this new technology-based contract regime is not without criticism. According to some scholars, smart contracts would require the support of traditional contract for the purposes of enforcement of legal obligations (Frankenreiter, 2019). This raises the question whether smart contract satisfy all the elements of a traditional contract. In particular, does the current contract law in Pakistan consider smart contracts as valid contracts? These are important queries as they pertain to determining legality of such contracts.

Blockchain is a decentralized database that records and stores information in a transparent and safe manner (Tavares Borges & Rodrigues Leite, 2024). Blockchain technology possesses the ability to store and time-stamp infinite transactions. These transactions cannot be tampered with or changed because inputs on blockchain cannot be altered (Cadogan, 2023). Hence, blockchain technology comprises of a decentralized digital ledger that registers across multiple computers in such a manner that registered transaction cannot be altered retroactively (Murray et al., 2021). As opposed to traditional databases which are characterized by control of a single entity, blockchains are supported by a network of nodes (computers) guaranteeing that no single person has control over the whole chain (Tavares Borges & Rodrigues Leite, 2024). Modern smart contracts are based on blockchain technology. They run on distributed networks (like Ethereum, Solana) which demonstrates that no single entity controls execution of contracts. Developers create smart contract in the form of codes that define rules and regulations this contract is theme in blockchain where it exists is an immutable code. A smart contract once triggered conditions encoded in the contract are satisfied. Lastly, the transaction in a smart contract is validated by blockchain network of nodes. This whole process demonstrates that smart contracts foster expediency and are concluded without the need for intermediaries.

Though smart contracts are seen as an expeditious and cost-effective replacement of the traditional contracts, there has also been a scathing critique on the legality and efficiency of these modern contractual instruments. The first concern is about the legality and validity of a smart contract. Unlike a traditional contract, a smart contract is an automated self-executing contract that does not require intermediaries. In most jurisdictions, a contract must satisfy certain conditions such as offer and acceptance, free consent, consideration and capacity. Since smart contracts operate on blockchain, they do not fulfill all of these essentials that poses a challenge for them. Since smart contracts are self-executory, they are more akin to a gentlemen's agreement than a legally enforceable contract (Werbach & Cornell, 2017). In context of this article, the requirements of a valid contract are mentioned in the Contract Act 1872 which is Pakistan's legislation that governs the subject of contracts. An analysis of this law suggests that the design of a smart contract is not in line with the regulatory framework of Pakistan. However, another legislation the Electronic Transactions Ordinance, 2002 does provide validity to the electronic transactions. The emergence of smart contracts raises a fundamental question: Are Pakistan's existing contract laws adequate for legal recognition

and enforcement of block-chain based smart contracts? With regard to this important question, this study focusses on examining whether the existing legal framework of Pakistan can accommodate smart contracts and what type of legislative measures may be required to remove uncertainty in such contracts. It also delves into a comparative analysis of some other common law jurisdictions to assess how these jurisdictions are coping with the challenges inherent in smart contracts.

2. THEORETICAL FRAMEWORK

This study is based on theoretical lens of law and technology theory to examine the scope and limitations of enforceability of smart contracts in Pakistani legal system. The premise of this theory is that change in technology has an important impact on legal rules and thus this nexus between technology and rules must have a separate theoretical framework (Moses, 2007). The introduction of new technologies often renders certain legal rules obsolete, so there is a need to appreciate the effect of technology over law. Employing Bernstein's (2007) advocacy for a general theory of law and technology and Cockfield and Pridmore's (2007) synthetic approach of law and technology, this study's framework analyzes blockchain based smart contracts and Pakistan's formal legal framework.

The reason for using a general theory of law and technology is because Bernstein (2007) argues that technology-specific theoretical frameworks fail to take into account broad societal limitations. Therefore, a general theory of law and technology is a more realistic theoretical lens to conduct this study. The advantage of using this theoretical framework is that the limitations of a legal system vis-à-vis new technologies could only be thoroughly analyzed by acknowledging that rules need to adapt to changes in technological innovations.

3. RESEARCH METHODOLOGY

This study draws on qualitative research methodology, combining doctrinal analysis, comparative legal analysis and normative analysis to evaluate existing laws and enforceability of smart contracts in Pakistan. Relevant statutes such as Contract Act, 1872, Specific Relief Act, 1877 and Electronic Transactions Ordinance, 2002 are analyzed to examine their application to the blockchain based smart contracts. Along with these primary sources the study has secondary sources, such as articles and comparative legal frameworks from other jurisdictions.

Furthermore, the study is based on objective approach. Primary sources, such as national and international statutes are selected and used due to their relevance in understanding the legal recognition and enforcement of smart contracts. While, secondary sources, such as journal articles and policy reports used in this study provide conceptual grounding and comparative analysis of developments on smart contracts. The analysis is primarily based on developments from 2013-2024, highlighting the period in which blockchain based smart contracts received regulatory attention.

As this research design is doctrinal in nature. It relies on non-human data, including legal texts and relevant scholarly literature. It does not involve human participants, interviews or empirical data collection.

The methodology is based on assessing the critique on legality of smart contracts and challenges in their enforcement. This methodology is employed to propose context-specific regulatory solutions for Pakistan's legal framework vis-à-vis smart contracts.

4. LITERATURE REVIEW

Cadogan (2023) argues that as smart contracts have certain technical features which may lead to the inference that they do not meet the necessary conditions for a legally binding contract between parties. Smart contracts do not employ human language and is based on technical code language that is not comprehensible to ordinary people due to which it is unlikely that this technical language represents the true contractual intentions of contracting parties (Cadogan, 2023). In most jurisdictions, the consensus of parties on the same terms is considered as an essential precondition of a valid contract; the absence of such consensus due to technical coded language is often deemed as a limitation of smart contracts.

In a vast majority of commonwealth countries, a contract can only be concluded by someone who has attained the age of majority. The Pakistani contract law also prescribes this requirement as a prerequisite for entering into a contract (Contract Act, 1872, s.11). According to Giancaspro (2017), as the identity of parties is often unknown in smart contracts, there is a potential risk that a party who is major may inadvertently contract with a minor who is cloaked behind the anonymity of a blockchain. The legal status of such contracts will be difficult to be determined. The obscurity of blockchain can give rise to such unintended transactions.

While describing limitation of smart contracts, Frankenreiter (2019) contends that blockchain technology could be used to illegal transactions such as money laundering and drug trafficking. Similar to many other jurisdictions, the contract law of Pakistan treats agreements based on unlawful consideration or object as void (Contract Act, 1872, s.24). This essentially employs that it is extremely difficult to ensure that consideration or object of the agreement is not unlawful in blockchain technology.

Enforcement of smart contracts is another daunting challenge. In any traditional contract, parties rely on certain institutions to enforce the terms of a contract. This is not the case in a smart contract. Werbach (2018) maintain that the execution of a legally binding contract can be automated but its enforcement requires human intervention. The parties in a contract could revise its terms or it could be set aside by a court at a later stage (Werbach, 2018). Conversely, a smart contract gives the whole enforcement control to a decentralized digital ledger. Once a smart contract is initiated, it cannot be altered or revised. Thus, stakeholders lack flexibility in a smart contract which makes the whole arrangement less efficient (Sklaroff, 2017). Sometimes, this lack of flexibility in modifying terms of a contract, results in inconvenience

and higher transaction costs for the parties. Furthermore, the absence of centralized intermediaries often gives rise to questions of enforceability, allocation of liability and jurisdiction (Raskin, 2017). In addition to that, the existing business models and regulatory frameworks tend to consider blockchain as a disruptive technology which could lead to obstacles in adoption of smart contracts in numerous industries (Swan, 2015).

While identifying the limitations of smart contracts, Borges and Leite (2020) claim that regulatory uncertainty is a huge obstacle for smart contracts, as there is a great variance in legal frameworks of different countries which often lead to inconsistent application of law. Furthermore, like any other digital platform, smart contracts are susceptible to potential cyber-attacks such as phishing attacks on wallets, smart contract bugs and hacks attempts which can shake the trust of parties in this new digital regime (Atzei et al., 2017).

Meraj (2024) suggests that the rules mentioned in contract law of Pakistan should be applied to a smart contract. By means of automatic execution in a smart contract in form of computerized code, smart contracts would eliminate the possibility of deliberate evasion of terms, disputes pertaining to factual circumstances and disputes regarding interpretation (Meraj, 2024). This suggestion may seem a bit out of place given the fact that it is not easy to simply apply the regulatory code of traditional contracts to smart contracts. The view that contracts executed via computer code contribute to reducing contractual disputes is flawed because the terms of contracts are in form of a technical code could only be interpreted by computer experts.

Some cryptocurrency experts have identified interpretation and dispute resolution as major challenges in implementation of smart contracts. It has also been suggested by some experts that legal professionals will have to develop understanding about blockchain coding to deal with smart contracts (Fenwick et al., 2017). Studies like these suggest that smart contracts are specialized contracts which should not be seen like traditional contracts.

Despite abundance of literature on smart contracts and their limitation, there are significant research gaps in context developing countries like Pakistan. Much of the existing scholarship has been on the interaction of smart contracts with the legal frameworks of technological advanced countries like the United Kingdom and European Union. Though this scholarship provides valuable insights and guidance, it does not take into account the peculiar challenges of developing countries where legal and institutional frameworks have not matured in response to technological innovations.

This study emphasizes on the impact of smart contracts on the domestic legal framework of Pakistan. Through doctrinal and comparative research methodology, this study offers a critical legal analysis that can contribute to a wider conversation on how existing laws could deal with smart contracts in developing countries like Pakistan.

5. LEGAL FRAMEWORK GOVERNING CONTRACTS IN PAKISTAN

The general law dealing with contracts in Pakistan is Contract Act, 1872, a colonial era statute that is still applicable today. This statute contains detailed provisions regarding formation, execution and enforcement of contracts. The requirements of Contract Act, 1872 applies to both traditionally written contracts and electronic contracts. Another special dealing with enforcing specific performance of contracts is Specific Relief Act, 1877. It lays down conditions in which a party can seek specific enforcement of contractual terms. The Electronic Transactions Ordinance, 2002 gives legal validity to electronic documents, signatures and transactions. Before diving into the specific challenges pertaining to smart contracts, it would be prudent to understand the legal requirements of a valid contract in Pakistan.

5.1 Contract Act, 1872

The Contract Act 1872 is a general law that governs contractual relationships in Pakistan. This law defines contract as "agreement enforceable by law" (Contract Act, 1872, s.2 (h)). This implies that not every agreement transforms into a contract. For an agreement to be enforced by law, certain characteristics must be present in it. Under this statute, a valid contract requires free consent, competence of parties, lawful consideration and object and an agreement not declared to be void (Contract Act, 1872, s.10). These requirements are similar to the requirements mentioned in other common law jurisdictions. English and Pakistani contract laws share core elements—offer and acceptance, intent to create legal relations, consideration, certainty and free consent (Andrews, 2011).

It is important to understand that any agreement which lacks these essential elements will not be enforceable. The assessment as to whether smart contracts fulfill these essentials will be discussed later. It must be understood that this 19th century legislation was enacted at a time when contracts were dependent on human intention and manual performance.

5.2 Specific Relief Act, 1877

The primary legislation that governs certain specific reliefs (like specific performance and injunctions) in civil suits is Specific Relief Act, 1877. This is another legislation which was made during British colonial era and still is employed by litigants to settle their civil claims.

According to Specific Relief Act, specific performance of contract may be enforced when: a) act is in nature of trust b) there is no standard to assess actual damages c) monetary compensation in form of damages is inadequate d) compensation cannot be recovered (Specific Relief Act, 1877 s. 12). The application of concept of specific performance to smart contracts is an interesting proposition. Given the technical character of smart contracts, can such contracts be specifically enforced if there is some problem in their enforcement.

5.3 Electronic Transactions Ordinance, 2002

With the rise of electronic-commerce industry, Pakistan introduced Electronic Transactions Ordinance in 2002. As opposed to the usual norm of relying on paper documents and ink-based signatures, this particular legislation was meant to streamline and validate transactions in digital form (Rafiq et al., 2023). Under the aegis of Government of Pakistan's IT Policy in 2000, an IT Law Forum comprising of country's prominent legal experts having expertise in information technology drafted this law for Pakistan. The two-fold purpose of this law can be seen in its Preamble which states: (1) "to recognize and facilitate documents, records, information, communications and transactions in electronic form, and (2) to provide for the accreditation of certification service providers" (Electronic Transactions Ordinance, 2002, Preamble). This demonstrates that this law recognizes transactions that take place on digital platforms.

The Electronic Transactions Ordinance, 2002 unequivocally recognizes and validates all documents, records, information, communication and transaction that are in electronic forms (Electronic Transactions Ordinance, 2002, s.3). By looking at this particular provision, some may think that it may facilitate legal recognition of smart contracts, however, it would be a highly presumptive approach. The question as to whether smart contracts can be covered under the framework of Electronic Transactions Ordinance, 2002 will be discussed in the next section.

6. APPLICABILITY OF PAKISTANI LEGAL FRAMEWORK TO SMART CONTRACTS

A glance at the existing laws vis-à-vis contractual relations makes it evident that there are regulatory gaps due to which smart contracts do not come within the ambit of these laws. As law and technology theory posits that the impact of change of technology on existing rules often demands new legislative and policy interventions. It is argued by the advocates of this theory that change in technology often gives rise to legal issues (Moses, 2007). Two of the statutes were enacted in the 19th century—a period way before the IT revolution. Even the modern Electronic Transactions Ordinance, 2002 predates the creation of blockchain smart contracts. However, to get a more holistic picture as to the challenges involved in regulation of smart contracts, it would be prudent to discuss the relevant laws one by one.

6.1 Smart Contracts and Contract Act 1872

As mentioned earlier, Contract Act 1872 was enacted to regulate traditionally written contracts with the help of human intermediaries. The emergence of blockchain smart contracts has seriously challenged notions related to traditional contracts. In this regard, this technological disruption has completely changed the paradigm surrounding creation and enforcement of

contracts.

Under the contract law of Pakistan, it is an essential requirement for a valid contract that parties to a contract must have attained the age of majority. Any contract concluded by minor is not enforceable under the present regulatory framework. Smart contracts lack this subjective element of legal capacity (Madir, 2018). Since these contracts are self-executory, they may be deployed by anyone having knowledge about the platform. This raises serious questions on the validity of smart contracts in the legal system.

The traditional contract law of Pakistan requires that an agreement only becomes a valid contract if its consideration and object are lawful (Contract Act, 1872, s.10). However, blockchain technology could be used for unlawful purposes. There is a view that money launderers find smart contracts a convenient tool to engage in illicit funds transfer (Sharif, 2024). Given the opaque nature of the distributed ledger on which smart contracts are based, it seems quite difficult to regulate each and every transaction on the platform.

6.2 Smart Contracts and Specific Relief Act, 1877

Specific Relief Act, 1877 provides a remedial framework for enforcing performance of contracts. This law lays down specific equitable reliefs that can be obtained in civil proceedings. Primarily, a court may grant relief of specific performance of contract where damages are not an adequate remedy (Specific Relief Act, 1877, s.12). This premise has significant relevance with such smart contracts which involve unique or high value digital assets (examples include non-fungible tokens and a time sensitive automated service).

The main query which arises in this context is whether smart contracts require specific performance? A vast majority of studies assert that the unique feature of smart contracts is that the formation and execution of these contracts is completely automated (Cieplack & Leefatt, 2017). With a self-executing computer code, a smart contract presumes specific performance and does not allow parties to breach the contract (Kun, 2021). This implies that there is a fundamental diversion between the specific performance provided in Specific Relief Act, 1877 and self-executing nature of smart contracts. The statute in question deals with ensuring performance of a contract made by humans in a language that is comprehensible to everyone; conversely, the coded language employed in smart contracts does not require intermediaries like courts and legal professionals for execution. This unique immutable nature of smart contracts renders the traditional notion of specific performance redundant.

6.3 Smart Contracts and Electronic Transactions Ordinance, 2002

As mentioned earlier, the prime purpose of Electronic Transactions Ordinance, 2002 is to recognize and validate digital documents, transactions and signatures (Electronic Transactions Ordinance, 2002, s.3). Mainly, this legislation was adopted to foster electronic commerce in the country by

authenticating electronic transactions. The law was passed in response to UN Model Law on Electronic Commerce. Other countries like Singapore and Hong Kong also enacted electronic transactions laws to facilitate electronic commerce (Senq, 2008).

This context of the Electronic Transactions Ordinance, 2002 makes it abundantly clear that this legislation was not meant to accommodate complex blockchain smart contracts rather it was only meant to streamline and expedite processing of online documents and transactions. It would be reasonable to allege that the legislation operates within a limited sphere and any attempt to accommodate smart contracts within its framework would defeat the purpose for which this law was enacted.

7. COMPARATIVE LEGAL PERSPECTIVES ON SMART CONTRACTS

7.1 The United Kingdom

The United Kingdom Law Commission's advice to government demonstrates that smart contracts must align with the UK's broad legal framework on contracts. The Law Commission's findings are based on following observations:

- **a.** Smart contracts meet all the legal requirements necessary for creating contracts. Offer and acceptance happens through deployment of code, consideration, in form of cryptocurrency is readily identifiable; intent to create legal relations can be deduced from actions of parties like using computer code (Law Commission, 2021).
- **b.** As much of the English contract law is based on common law, the courts can flexibly interpret the code of smart contracts using existing principles in contract (Law Commission, 2021).
- **c.** Simple smart contracts (such as bank payments) do not present a formidable legal challenge as such automation is already quite common. As far as complex contracts are concerned, they could be dealt with by applying existing principles (Law Commission, 2021).
- **d.** Smart contracts should not be used in deeds that require specific legal formalities like witnesses and writing (Law Commission, 2021).

The critics believe that the Law Commission did not appreciate the nuanced differences between a traditional contract and a smart contract. As far as interpretation of smart contracts is concerned, the code should itself be seen as law, thus leaving no room for interpretation. The Law Commission takes exception to this line of thinking and maintains that just like terms of a traditional contract, the code of a smart contract can be interpreted. Drawing such parallels is not realistic as unlike traditional contracts, smart contracts execute coded instructions in deterministic manner.

7.2 The European Union

The European Union has emerged as a global leader in drafting

comprehensive legislation on use of data and data protection. The European Commission views blockchain as a strategic technology that has potential to make Europe home to platforms, applications and tech companies (European Commission, 2023). The EU is perhaps the only jurisdiction that has defined a smart contract in its legislative framework in the following words, "smart contract means a computer program used for the automated execution of an agreement or part thereof, using a sequence of electronic data records and ensuring their integrity and the accuracy of their chronological ordering" (Data Act, 2024, art.2 (39). The EU Data Act is an all-encompassing legislation that also contains ample details on regulation of smart contracts.

As per the Data Act, the blockchain smart contracts must fulfill the following requirements:

- **a.** Smart contracts must be robust against errors with access control mechanism. (EU Data Act, 2024, art.36)
- **b.** Smart contracts must incorporate termination mechanisms (e.g., kill switch) to stop execution (EU Data Act, 2024, art.36)
- **c.** The vendors of smart contracts must ensure that in case of termination, the past data is properly archived (EU Data Act, 2024, art.36).
- **d.** For protection of smart contracts, there must be rigorous access control mechanisms (EU Data Act, 2024, art.36).
- **e.** The smart contract terms must be consistent with data-sharing agreement to ensure verifiable execution (EU Data Act, 2024, art.36).

The EU Data Act demonstrates a strong legislative intervention to regulate smart contracts. In terms of regulation of data, the European Union is way ahead of many other advanced jurisdictions.

8. WAY FORWARD FOR PAKISTAN

The main premise of law and technology theoretical framework is that legal response to technological change has an immense impact on important values and interest of a society (Cockfield, 2003). This theoretical framework has the advantage of encouraging anticipatory legislative and judicial interventions to address the legal lags with respect to emerging technologies. The old laws governing contracts in Pakistan do not cover blockchain smart contracts. It is also equally true that the socio-economic conditions of Pakistan are different from those of industrialized countries. Therefore, Pakistan's regulatory response vis-à-vis smart contracts must be based on its own legal culture while incorporating useful and practical insights form international best practices. The following policy initiatives could help Pakistan navigate the ways to address regulatory challenges vis-à-vis smart contracts:

- **a.** There is an immediate need for revising existing legal framework including the Contract Act, 1872 and Electronic Transactions Ordinance, 2002. Instead of having a special law for smart contracts, these two legislations could be amended to include smart contracts as valid contracts. Contract Act, 1872 should

acknowledge the validity of smart contracts. While Electronic Transactions Ordinance, should define terms like smart contract, automated transactions and blockchain based agreements.

b. As smart contracts often involve dealing with complex computer coding, it would be important to build capacity of legal fraternity including judges and practitioners. The Federal Judicial Academy could initiate trainings aimed at creating greater sensitization about legal tech issues like smart contracts.

c. To build expertise in this particular field, the law schools and Bar Councils could offer specific courses on smart contracts, blockchain regulation and impact of technology on law.

d. As Pakistan is a common law country, encouraging strategic public interest litigation could lead to precedents that define the legal validity of smart contracts and dispute resolution in automated transactions.

e. Pakistan could also benefit from experiences of other nations that have taken legislative and policy measures on smart contracts. This international collaboration could help in developing common legal standards for blockchain based smart contracts.

f. The Law and Justice Commission of Pakistan could seek feedback from the tech industry specialists and develop model guidelines for smart contracts. These guidelines may cover dispute settlement procedures, jurisdictional issues and human override options in smart contracts.

9. CONCLUSION

This study has assessed the legal implications of smart contracts in Pakistan through doctrinal and comparative lens. The overall analysis showed that the present regulatory framework of Pakistan is not ready to address the challenges posed by smart contracts. The country lacks legal and institutional readiness to deal with issues such as enforceability and dispute resolution pertaining to smart contracts. A comparative analysis of other jurisdiction reveals that numerous countries are proactively making the necessary legislative and policy shifts to deal with the challenge of smart contracts. Pakistan can adapt its institutional framework by drawing lessons from these jurisdictions. However, bridging gap between the technological innovations and static legal framework requires more than just ephemeral legislative reviews. Pakistan needs to adopt a holistic policy change towards legal adaptability, building expertise and anticipatory digital governance.

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