

The integration of Artificial Intelligence in Islamic crowdfunding: A technological lever for financing Algerian Start-ups – Study of opportunities and Sharia compliance risks

دمج الذكاء الاصطناعي في التمويل الجماعي الإسلامي :
رافعة تكنولوجية لتمويل الشركات الناشئة الجزائرية -
دراسة الفرص ومخاطر الامتثال الشرعي

Imen Hiba ZIANI¹

¹ (École Supérieure de Gestion et d'Économie Numérique "ESGEN"/High School of
Management and Digital Economy "HSMDE",
Management and Economy Smart Solutions Laboratory "MESSLA"), iziani@esgen.edu.dz
Received: 2026-04-06 Accepted: 2026-06-27

Abstract:

This work looks into combining artificial intelligence with crowdfunding guided by Islamic rules to tackle funding shortages for new businesses in Algeria. Start-ups may drive economic change there, yet banks frequently step back because such ventures carry big uncertainties. Instead of relying only on old systems, machine learning might sharpen religious compliance checks, judge borrower reliability more accurately, while also smoothing daily operations online. Still, blending code with faith-based criteria risks creating unseen gaps, where tech decisions clash quietly with spiritual standards, and hidden biases could grow without careful oversight. A mix of expertise, spanning theology, finance, and computer science, becomes essential not as an afterthought but as protection against misalignment. When tools learn fast but values stay fixed, balance depends less on speed than direction; trust forms slowly when ethics anchor progress.

Keywords : Artificial intelligence, Islamic crowdfunding, Start-ups financing, Algeria, Sharia compliance

Jel Classification Codes : G20, G21

ملخص :

يتناول هذا العمل دمج الذكاء الاصطناعي مع التمويل الجماعي القائم على الضوابط الشرعية الإسلامية، وذلك بهدف معالجة إشكالية نقص التمويل التي تواجه المشاريع الناشئة في الجزائر. ففي الوقت الذي تُعدُّ فيه الشركات الناشئة محركاً محتملاً للتحويل الاقتصادي، غالباً ما تتحوط البنوك من تمويلها نظراً لما تنطوي عليه من درجات عالية من عدم اليقين. وعوضاً عن الاعتماد على الأنظمة التقليدية فقط، يمكن لتقنيات تعلم الآلة أن تُسهل في تعزيز آليات الامتثال للضوابط الشرعية، ورفع دقة تقييم الجدارة الائتمانية للمقترضين، إلى جانب تسهيل العمليات اليومية عبر المنصات الرقمية. بيد أن مزج الخوارزميات بالمعايير المستمدة من أحكام الشريعة قد يُفضي إلى فجوات غير منظورة، حيث تتصادم القرارات التقنية مع المبادئ الشرعية بصورة صامتة، كما قد تنشأ تحيزات خفية في غياب الرقابة الدقيقة. لذلك، يصبح توظيف خبرات متعددة التخصصات تجمع بين الفقه والمالية وعلوم الحاسوب أمراً جوهرياً لا من باب الترف الفكري، بل بوصفه ضماناً لتفادي أي انحراف عن المقاصد المنشودة.

وحين تتسم أدوات الذكاء الاصطناعي بسرعة التعلم بينما تظل القيم ثابتة، فإن تحقيق التوازن يرتفع أكثر بسلامة التوجيه منه بسرعة الأداء، فالثقة لا تُبنى إلا ببطء حين تكون الأخلاق هي الركيزة التي يقوم عليها التقدم.

كلمات مفتاحية: الذكاء الاصطناعي، التمويل الجماعي الإسلامي، تمويل الشركات الناشئة، الجزائر، الامتثال الشرعي.

تصنيف JEL: G20, G21

1 INTRODUCTION

Artificial Intelligence (AI) is currently catalyzing a paradigm shift within the global financial sector, and Islamic finance is no exception. By automating Sharia compliance, optimizing risk management, and personalizing financial services, AI facilitates an ethical framework that strictly adheres to the prohibition of *riba* (usury), *gharar* (uncertainty), and *maysir* (speculation). In Algeria, while banking digitalization is steadily progressing, the integration of AI within Islamic financial structures is still in its nascent stages, yet it holds transformative potential for the national economy.

Algerian start-ups are increasingly recognized as vital engines for economic diversification and growth. However, these ventures face a critical "funding gap." Traditional banking institutions often view start-ups as high-risk due to a lack of tangible collateral and documented credit histories, leading to high rejection rates. Consequently, an overwhelming 81.8% of Algerian entrepreneurs are forced to rely solely on personal savings or informal family support, a strategy that severely limits the scale of innovation. Furthermore, the interest-based nature of conventional loans creates a moral and religious tension for many founders, further discouraging the use of traditional credit.

In response to these systemic frictions, Islamic FinTech, specifically Sharia-compliant crowdfunding, emerges as a viable alternative. By utilizing risk-sharing models such as *Mudaraba* and *Musharaka*, this approach aligns financial practices with community values. The integration of AI acts as a "governance-transforming force" in this ecosystem. Machine learning algorithms can parse vast, non-traditional datasets (digital footprints and market signals) to assess borrower reliability, thereby opening credit access to those overlooked by classic metrics. Simultaneously, the use of blockchain-backed smart contracts can eliminate "Sharia waste", operational inefficiencies and bureaucratic delays that often plague Islamic financial agreements.

Despite these opportunities, the "black box" nature of complex algorithms presents significant challenges for Sharia compliance. Algorithmic opacity can obscure the reasoning behind financial decisions, making it difficult for Sharia Supervisory Boards to verify alignment with ethical and religious standards. If left unmonitored, these automated systems risk creating a "symbolic compliance" where the outward appearance of adherence masks underlying ethical gaps or hidden biases.

This research seeks to address the central question:

What are the stakes and challenges of integrating artificial intelligence into Islamic finance?

Specifically, this study explores how AI can contribute to monitoring Sharia compliance in real-time, the benefits and disadvantages of such technologies within the Algerian banking context, and the necessity of "hybrid governance" models that combine the expertise of Sharia scholars with data scientists to ensure that technological progress remains anchored in ethical principles.

1- Algerian start ups face funding challenges

Starting fresh, Algeria now sees young businesses as key drivers for growth without draining resources. Although programs such as the "Graduate Start-ups" policy, officially Decree 1275, have launched, raising funds beyond personal circles stays difficult. Because standard banking options carry steep costs labeled *riba* and demand complicated collateral setups, many creators turn instead to savings or support from family. Rather than seek traditional credit, entrepreneurs lean on internal reserves when getting ventures off the ground.

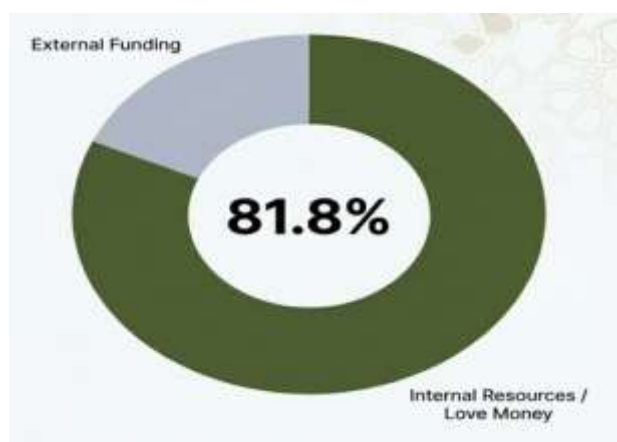
Fueled by demand for ethical finance, Islamic FinTech reshapes access through models like *Mudaraba* and *Musharaka*, structures built on shared outcomes rather than fixed returns. Where banking records fall short, artificial intelligence steps in, parsing vast datasets to assess credibility using non-traditional signals.

Starting fresh, Algeria now backs young businesses as key players in growing its economy affordably. Instead of relying on old patterns built around resource dependency, officials are betting on innovation. One tool in this shift came in 2022, Decree 1275, labeled "Graduate – Start-ups," emerged to spark entrepreneurial drive among students. Rather than waiting for large investments, graduates receive support to launch their own ventures early. Behind these moves lies a clear goal: reduce reliance on oil-driven income by nurturing homegrown talent.

Not everyone agrees it will work, yet momentum continues building through policy changes aimed at universities.

Even so, growing numbers of startups do little to ease their struggle for outside funding. A full 81.8% turn first to personal savings. Behind such figures lies deep uncertainty about banks or investors. Control matters more than scale, many believe. Family cash and friend-backed support fill gaps institutions leave open. Trust runs low where capital is concerned. Self-reliance becomes strategy by default.

Algerian founders financing approach



Source: Boukhelf (2023).

Despite their central role, traditional banks in Algeria struggle with the uncertainties tied to start-ups ventures. Because of this gap, entrepreneurs tend to look elsewhere instead of seeking support through standard loan channels

Interest rates seen as *riba* create tension within religious communities, discouraging business expansion under Islamic guidelines.

Young businesses often lack physical assets, making it hard to meet bank demands. Yet strict rules mean lenders require solid proof of repayment ability. Without property or savings, new ventures struggle to qualify. Even so, financial institutions insist on documented track records. So applicants without prior borrowing history face automatic rejection. Still, these conditions reflect risk control practices common across traditional banking.

Lengthy evaluation phases slow down decisions. Because of fixed bureaucratic steps, new businesses struggle more when seeking loans. As a result, access becomes harder under standard banking models.

Within this setting, Islamic FinTech steps forward, particularly through Sharia-compliant crowdfunding, as a key response to the shortfall ignored by traditional financing. Rather than relying on debt, structures such as Mudaraba and Musharaka operate differently: they spread both gains and setbacks among participants. Such approaches resonate deeply with Algeria's long-standing traditions of shared support. By unlocking funds once held back due to religious restrictions on interest, these tools bring movement to stagnant capital. Profit flows become possible without compromising belief, breathing new energy into local enterprise. Unexpected pathways open when faith-guided finance meets innovation.

Table 1: Comparative analysis of financial friction points and FinTech solutions

Feature	Conventional Algerian banking	AI-enabled Islamic crowdfunding
Ethical basis	Interest-based (Riba)	Risk-sharing (Musharaka/Mudaraba)
Access requirement	Tangible collateral & credit history	Digital Credit Profiling (Alternative data)
Efficiency	Long review periods & bureaucracy	Real-time execution via Smart Contracts
Risk management	Collateral-focused security	AI-driven predictive analytics

Source: Adapted from Boukhelf (2023) and Benarbia (2025).

From the start, artificial intelligence powers a shift in how digital credit works. Instead of traditional methods, machine learning guides evaluations through pattern recognition. Predictive analytics come into play by anticipating borrower behavior using historical data. With these tools, systems adjust risk assessments dynamically. Decision processes evolve as algorithms detect subtle trends. In turn, lending becomes more responsive to individual profiles. Behind the scenes, models continuously refine their judgments

Starting with non-traditional information sources, artificial intelligence builds detailed borrower assessments for new businesses without standard records. Instead of relying on past loans or revenue statements, systems analyze patterns across digital activity, transaction behavior, and market signals. These models detect reliability through indirect markers often overlooked by conventional lenders. By shifting away from classic metrics, they open access where old methods fall short. Some rely solely on invoices, while others examine supply chain roles or social engagement trends. Each approach adjusts dynamically based on fresh inputs rather than fixed criteria.

Using smart tools built on blockchain and AI, credit checks become quicker, clearer, yet far less prone to risk compared to old-style human evaluation. While once slow and hidden, these digital methods now deliver results with speed, leaving paperwork behind without sacrificing accuracy. Instead of waiting days, decisions happen in moments, driven by code, not clerks. Because automation takes over repetitive tasks, errors drop while trust grows among lenders and borrowers alike.

Thanks to better risk forecasts, artificial intelligence helps cut gaps in available knowledge. With sharper assessment tools, lenders following Islamic principles reach more borrowers. These improvements support long-term stability in lending decisions.

Ultimately, weaving artificial intelligence into Islamic finance creates a practical tool, one that sidesteps outdated structures in Algeria's conventional banks. This shift opens space, ethical, functional, for new ideas to gain support without compromising principles. Efficiency emerges not through speed alone, but by aligning purpose with practice.

2- Theoretical framework: Islamic finance and technological innovation

Forbidden by design, interest, known as *riba*, joins excessive ambiguity and reckless gambling under Islam's financial restrictions. Shunning standard models that chase profit alone, these systems anchor progress in *Maqasid al-Shariah*, a framework rooted in fairness. Transparency matters, yes, but so does collective well-being. Guided by purpose rather than gain, each development answers first to ethical intent. Outcomes reflect not just numbers, but human impact.

Far from just being a gadget, AI reshapes how rules are applied. Within crowdfunding, oversight evolves, no longer delayed until after launch, instead woven throughout a project's life. Ethical standards become part of the code itself, guided by smart systems that act early and often. Decisions gain structure without waiting for outcomes first.

Starting from ethical principles, this study connects faith-based rules with changes brought by digital tools. Looking into artificial intelligence's role in new business funding requires examining Islamic financial guidelines, alongside the ways tech reshapes decision-making structures.

2-1- Essential guidelines along with broader aims (Maqasid al-Shariah)

Rooted in moral principles, Islamic finance goes beyond avoiding certain transactions. Instead of focusing only on rules, it builds decisions around fairness and responsibility, shaped by law, guided by ethics

Despite common financial goals, Islamic finance draws clear boundaries around certain practices. Riba, often understood as interest, finds no place within its framework. Contracts burdened with too much uncertainty, known as gharar, are set aside without exception. Maysir, resembling gambling or pure speculation, is similarly rejected outright. Performance matters less than adherence to ethical structure. Transparency becomes a requirement, not an option. Every transaction ties to tangible assets. Risk moves between parties rather than falling on one side alone. Profit motives never override foundational principles.

Starting from core principles, innovation within finance ought to reflect the broader aims of Islamic jurisprudence. Rooted in fairness, collective well-being, and avoiding damage, these goals shape what counts as legitimate progress. Rather than focusing only on profit growth, economic actions are measured by their real societal impact. This shifts compliance beyond mere rule-following into a space shaped by moral responsibility. Seen this way, adherence becomes less about forms and more about purposeful conduct.

2-2- AI as a "Governance-transforming force"

Shifting toward Artificial Intelligence changes the way Shariah compliance works. Instead of waiting, oversight now adapts before issues arise. Periodic checks by Shariah Supervisory Boards happen after contracts form under older models. With new tools, evaluation begins earlier in design phases. Decisions gain support through automated pattern detection. Oversight bodies still guide outcomes, though timing shifts forward. Reviews once followed launches; today they anticipate them.

Because algorithms keep running while constantly adapting, this framework struggles to keep up in settings shaped by artificial intelligence. Seen this way, AI shifts how authority works, pushing regulation to follow ongoing cycles instead of fixed stages. Embedding Islamic principles begins at creation, continues through rollout, yet remains visible during active tracking too.

Figure 2: Transition from traditional to AI-driven Sharia governance.



Source: Adapted from Tedjani & Keddi (2025).

2-3- Removing inefficiencies labeled as “Sharia waste” by using automated systems

Within this model, cutting down what's called "Sharia waste" matters most, not because it sounds urgent, but because stalled processes or rule breaks in Islamic agreements tend to slow things without notice. This type of drag often goes unseen until output dips.

Sharia waste must be strictly defined as a major operational inefficiency where contractual non-compliance or bureaucratic friction results in stagnant capital and significant opportunity costs for the ecosystem

Processing delays occur frequently since Islamic financial agreements, such as Murabaha or Musharaka, demand exact terms alongside several approval stages. Though structured, these procedures involve intricate steps that stretch timelines unexpectedly. Each phase must align strictly with religious and institutional rules, slowing momentum further. Since verification spans multiple parties, completion takes longer than standard arrangements. Precision, while necessary, introduces time costs across every checkpoint.

Real-time compliance emerges when technology meets Sharia principles, smart contracts enable instant execution, provided automated screening confirms adherence at each stage. Because checks happen continuously, errors slipping through manual reviews grow less likely. Transactions proceed without delay if rules are met, cutting losses tied to missteps. Efficiency rises where systems align correctly, avoiding setbacks caused by mismatched terms. Oversight becomes seamless, not because it's complex, but because it runs consistently beneath the surface.

2-4- Hybrid governance meets explainable Artificial Intelligence

Despite growing reliance on automation, worries persist over how opaque algorithmic processes can be. For institutions to stay credible, scholars suggest grounding practices in a clear theoretical model

When artificial intelligence offers clear reasoning, religious oversight groups can check how choices are made. Because transparency matters, leaders verify whether results, like rating someone's financial trustworthiness, include forbidden aspects such as unfair favoritism or guesswork. Decisions unfold step by step, so ethical review becomes possible. If a system hides its steps, doubt remains; clarity removes room for hidden issues. Oversight bodies need visibility, not just conclusions but pathways, to confirm alignment with principles.

Working across fields reshapes how institutions are built, here, experts in Islamic law team up with analysts and oversight professionals. These collaborations keep tech aligned with religious ethics, yet fast enough for today's emerging businesses. Speed meets principle when diverse specialists share responsibility.

Ultimately, weaving artificial intelligence into Islamic finance shifts focus from mere appearances to a framework where moral values shape real outcomes. When ethics become part of how systems operate, digital fundraising guided by AI offers clear, reliable support tailored for emerging business builders in Algeria.

3- Analyzing AI and FinTech in Sharia compliance automation

Facing modern challenges, these tools tackle inefficiencies in contract execution. While automation streamlines processes, transparency builds trust across parties. Where traditional systems lag, digital verification fills gaps reliably. Through decentralized records, compliance becomes easier to track. As transactions grow more intricate, smart contracts respond with precision. With every step logged securely, disputes find resolution faster

Start-ups might face initial checks through automated tools designed to assess alignment with Islamic guidelines. Compliance often depends on avoiding industries like gambling or alcohol production. Financial metrics receive scrutiny under these digital evaluations too, some systems flag unsuitable cases quickly. Rules around permissible activities shape how algorithms operate during screening phases. Efficiency emerges not from speed alone, but from consistent rule application across proposals. Decisions derive from preset criteria embedded within software frameworks. Filtering happens before human review even begins in some setups. Religious standards guide the structure of computational assessments indirectly. Predefined boundaries

limit what kinds of ventures pass without further inquiry. Technology shifts oversight tasks, though final judgments may still involve experts later.

Beginning with blockchain, smart contracts let artificial intelligence manage Musharaka or Sukuk deals automatically. These systems enforce rules instantly, cutting delays caused by manual steps. Errors tied to people drop sharply when processes run on coded logic. Compliance happens continuously, not just during reviews. Religious standards are maintained without relying on constant oversight. Efficiency rises because actions trigger only when conditions are met. Unlike traditional methods, adjustments occur in sync with live data. Rules embedded in code help avoid deviations considered non-compliant. Oversight becomes more predictable, less reactive. Technology supports accuracy while respecting financial principles.

Starting with risk awareness, artificial intelligence sharpens how lenders evaluate applicants while narrowing knowledge gaps. This shift enables faith-based financial providers to reach overlooked groups without compromising long-term stability. Progress unfolds gradually when systems learn faster than people expect.

When AI meets blockchain, new paths open for simplifying Islamic finance operations. Since these financial instruments rely entirely on contractual terms and strict adherence to Sharia principles, processes tend to slow down, weighed by layers of oversight. Automation steps in where manual review once dominated, streamlining checks that used to take days. By embedding regulatory logic into code, systems reduce errors while maintaining alignment with religious guidelines. Efficiency rises when repetitive tasks get reassigned to intelligent algorithms. Risk patterns become easier to spot as data flows through decentralized networks. Each advancement shifts focus from paperwork toward precision. Trust gains strength not through promises but traceable actions. Innovations reshape old bottlenecks without altering foundational values. What emerges is not disruption, but refinement.

3-1- Automated Sharia screening and ethical filtering

Starting with tools like machine learning and natural language processing, automation now handles early steps in finance. These technologies shape how tasks unfold before human review begins. Early phases of the financial process see growing support from artificial intelligence systems. Tasks once manual shift toward smart software assistance gradually. Finance operations evolve as digital methods take on repetitive work first.

Algorithms might screen startup ventures based on religious guidelines, using financial metrics to ensure alignment. Instead of human review, automated systems examine balance sheets and profit structures closely. Compliance often hinges on avoiding industries deemed harmful, like alcohol production or betting platforms. Investment bans apply equally to tobacco firms and arms manufacturers. Through ratio analysis, digital tools flag unsuitable opportunities early. Religious consistency becomes measurable when software blocks shares tied to unethical sectors. Screening happens continuously, reducing reliance on manual audits. Financial health gets assessed alongside moral criteria in real time. Startups must meet both economic thresholds and doctrinal standards simultaneously. Technology enables precision where traditional oversight may lag behind. Verification now occurs without delays typical in older evaluation methods. Rules-based engines enforce boundaries that reflect long-standing ethical positions. Monitoring adapts quickly as new data enters the system. Filtering works quietly beneath user interactions, shaping outcomes invisibly. Checks run constantly, ensuring adherence never slips unnoticed.

Quality checks under Sharia now connect straight to daily operations through automated systems. Because they rely on Explainable AI, members of Sharia boards are able to examine how decisions emerge step by step. Such visibility supports clearer oversight. The method holds steady alongside Islamic juristic principles without drifting. Clarity in algorithm behavior becomes possible, alignment follows naturally.

3-2- Blockchain and smart contracts: Eliminating "Sharia Waste"

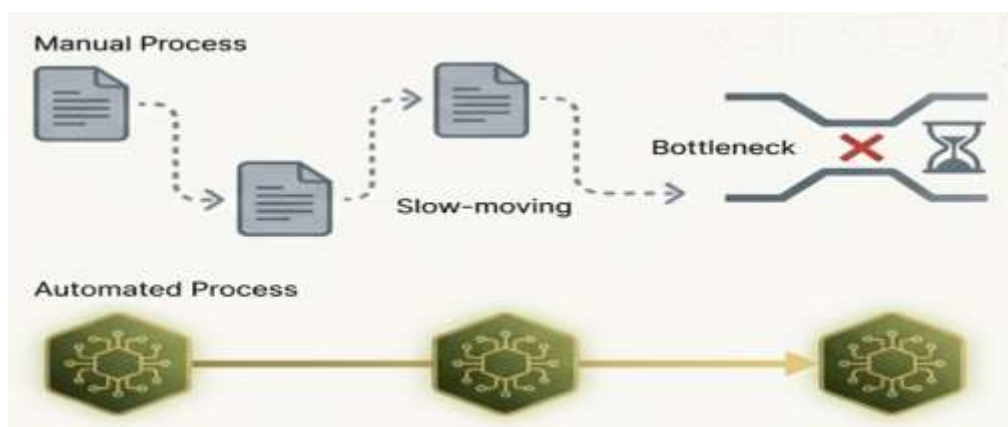
Blockchain helps cut down on what's known as "Sharia waste," which refers to lost resources, operational hiccups, and damaged trust caused by contract missteps or slow processes. Though often overlooked, these gaps can ripple through systems. Where rules aren't followed promptly, setbacks follow, delays pile up, effort drains away. One missed step might trigger wider strain across transactions. With clearer tracking, such slippage finds less room to grow.

When conditions are satisfied, smart contracts activate themselves, these digital tools carry out agreed actions without people stepping in. For partnerships like Musharaka or investment certificates such as Sukuk, timing lines up instantly, cutting delays. Rules apply the moment triggers occur, so oversight becomes unnecessary. Because middlemen fade out, expenses drop naturally. Trust shifts from institutions to coded logic, running in the background.

A single version of events appears across all records, thanks to how information spreads on blockchain networks. Because changes cannot be undone once logged, tracking who did what

becomes straightforward. For Smart Sukuks, this means tokenized shares move clearly from one party to another without hidden steps. Payments follow set paths built into the system, reducing delays. Smaller firms benefit since entry barriers drop when processes run openly. Security builds naturally, not by extra layers but by design.

Figure 3: Operational mechanism for reducing procedural waste.



Source: Tedjani & Keddi (2025).

3-3- Risk detection and reduction of information asymmetry

What happens when machines help small businesses get loans? In Algeria, many new companies struggle to borrow money through regular banks. Artificial intelligence steps in where old systems fail. Instead of relying only on credit history, smart algorithms consider different factors. This shift opens doors for entrepreneurs previously ignored. As a result, funding reaches corners it never touched before. Hidden potential starts finding support not tied to tradition.

Starting with digital footprints, credit evaluations powered by artificial intelligence sort through non-traditional data at scale, helping startups gain access despite missing standard records. Because lenders see clearer pictures, gaps in understanding shrink sharply between founders and funders.

With sharper oversight on rule violations and better identification of deceptive practices, AI-backed tools boost the effectiveness of Sharia audits. Because of this, financial organizations can broaden credit access to overlooked groups without compromising steady returns or organizational strength. Improved alert mechanisms mean fewer surprises in performance, even when expanding into riskier markets.

Ultimately, blending tech with Sharia norms cuts unnecessary steps, keeping processes running clearly. If managed well, such systems push Islamic finance past mere appearances into a space where effectiveness and faith alignment merge naturally.

4- Algeria's terrain seen through observation

Though recognition of FinTech stands at 54% among participants, real-world use of digital tools remains limited in Algerian Islamic financial institutions like Al Baraka and BADR. Despite visible interest, integration of advanced tech solutions has barely begun across these field-tested cases.

A gap between technology and religious norms emerges as one obstacle, while bureaucratic resistance slows change. Another issue lies in outdated digital frameworks, online transactions lack reliability needed for AI-based fundraising tools. System upgrades remain essential yet delayed by structural inertia.

Not knowing enough about Islamic finance leaves many Algerian business founders unprepared, education could change that. Some miss key ideas simply because learning opportunities are scarce. When guidance is missing, new financial tools stay unused. Without clear understanding, potential stays hidden. Training might quietly fix what confusion has blocked.

A wave of confidence sweeps through Algeria's finance sector, yet real progress lags behind ideas. Although new businesses are seen as key drivers of growth, the systems supporting them are still finding their footing. One sees ambition outpacing infrastructure. Where digital knowledge grows fast, practical rollout moves slowly. Even with strong belief in innovation, much of the framework stays unfinished. Progress feels close, but not quite arrived.

4-1- The awareness-adoption gap

More than half of those surveyed at Al Baraka Bank and BADR Bank emphasize the value of understanding FinTech, based on real-world observations. Though interest is clear, progress toward integrating intelligent systems remains limited, placing both banks near the beginning of technological transformation.

Excitement about what lies ahead runs high, rated on average 4.6 out of 5 by those working in banking. Though expectations differ slightly, most see room for growth. Because confidence remains strong, forward-looking views dominate discussions. While risks exist, they seem

outweighed by potential gains. Despite uncertainties, sentiment leans heavily toward opportunity.

Beyond recognition of the issue, progress in product development stays narrow, many offerings stick to long-standing formats, though a few digital steps appear here and there. Still, real change lags behind understanding.

Table 2: FinTech perception and implementation in Algerian Islamic banks

Metric	Findings / Values
FinTech awareness support	54% of bank professionals
Future professional optimism	4.6 / 5 (Mean Score)
Current implementation stage	"Early Stages" of smart technology use
Founder knowledge gap	45.5% lack info on Islamic finance modes

Source: Benhadjar & Hassani (2025).

4-2- Structural challenges: The "Tech-Sharia disconnect" and administrative rigidities

Despite identified potential, obstacles hinder smooth adoption of artificial intelligence within Islamic financial systems across Algeria. Some challenges stem from regulatory uncertainty, which complicates alignment with religious principles. A lack of technical expertise slows development in key areas. Infrastructure gaps further limit progress, especially in rural regions. Resistance to change appears among traditional institutions reluctant to shift established practices. Data privacy concerns add complexity to implementation efforts. Cultural perceptions about technology also shape acceptance levels unevenly. These factors combine to delay meaningful convergence between innovation and faith-based finance

A study conducted at Al Salam Bank Algeria identifies a unique form of operational loss called "Sharia waste." Such inefficiency stems primarily from contractual non-compliance. Instead of alignment, gaps emerge between technology setups and religious guidelines. Because digital tools lack deep coordination with Sharia supervision, errors occur more frequently. Precision tends to slip, timing issues arise, ultimately fueling avoidable setbacks.

Despite rigid hierarchies, some organizations struggle to adapt due to deeply rooted resistance toward change. Decision-making remains centralized, limiting collaborative input across levels. Slow approval workflows hinder progress, especially when assessing intricate Islamic finance agreements such as Murabaha or Istisnaa. Over time, these delays foster inertia within management structures. Institutional routines prioritize procedure over responsiveness, reinforcing a static operational model.

Despite progress, digital infrastructure in Algeria remains underdeveloped, especially in fiber optic coverage and reliable internet access. High-speed connections are uneven, while homegrown cloud services lag behind global standards. Payment systems pose another hurdle; electronic transactions face structural weaknesses. Virtual currencies cannot be used at all due to government restrictions. These gaps make it difficult for AI-powered fundraising platforms to take root. Without stronger connectivity and financial tools, innovation struggles to advance.

Table 3: Identified hurdles to AI-driven financial innovation

Category	Specific identified barriers
Digital infrastructure	Lack of local cloud providers, slow internet, and fiber optic deficits.
Administrative culture	Rigid bureaucracy and resistance to participatory decision-making.
Legal framework	Delays in Crowdfunding regulation and electronic signature adoption.
Knowledge/Cognitive	51.5% of entrepreneurs have not considered Islamic finance.

Source: Adapted from Benarbia (2025) and Boukhelf (2023).

4-3- The founder awareness gap and educational needs

One major challenge slowing growth in these new models lies in how startup-leaders often miss key expertise. Founders diving into untested systems might not grasp necessary details early on. Without solid understanding, progress tends to stall unexpectedly. Gaps in practical skills surface just when momentum matters most. Knowledge shortfalls show up plainly during critical development phases. Learning curves become barriers if support structures stay weak. Experience gaps weigh heavier when innovation pushes forward too fast

A fifth less than half of those surveyed lack basic awareness about how Islamic finance operates, particularly its startup funding models. About half of business founders never viewed it as something worth exploring for their ventures. One person in every two simply overlooked this path entirely when planning new initiatives.

Faith-based concerns often shape financial choices. Some entrepreneurs steer clear of conventional banking because charging interest conflicts with religious beliefs. Instead, turning to Sharia-compliant options seems logical, yet hurdles remain. These alternatives may demand physical collateral, creating difficulty for those without assets. Lengthy processing times add another layer of challenge. What appears simpler at first glance turns out to carry its own complications.

Because grasp of Islamic legal principles remains limited, mistakes in drafting contracts happen again and again. These recurring issues damage client confidence while raising chances of regulatory breaches. Ongoing learning initiatives are emerging as a key response, offering structured workshops paired with shared case reviews across institutions. Without such efforts, inconsistencies tend to persist unchecked.

4-4- A future vision for Algeria

Despite such hurdles, studies indicate progress could emerge when investment flows into Algeria's quantum technologies.

- Hybrid governance architectures: Integrating Sharia scholars with data scientists to oversee AI lifecycles.
- Funds backed by FinTech step in where small businesses often struggle, offering targeted help so local firms can build their own Islamic financial technology tools. Support arrives not through broad programs but focused initiatives meant to spark innovation within domestic markets. Instead of relying on foreign systems, companies gain resources to shape digital solutions aligned with religious principles. Assistance flows toward startups willing to blend tradition with modern tech needs.
- Fundamental updates to a country's information networks make seamless online exchanges possible. Replacing outdated technology ensures money moves quickly through digital channels. Where old systems once slowed progress, new platforms now support steady financial flows. Efficiency grows when communication tools evolve alongside transaction methods. Progress appears most where upgrades meet everyday needs. Smooth operations depend on reliable connections beneath the surface.
- Focused on real needs, those of workers inside banks and business founders alike, Algeria might shift away from mere appearances of adherence. A system emerges where daily efficiency blends naturally with faith-based principles, not forced apart but held together by

design. What once felt like separate paths now moves in step, shaped by practical understanding rather than rigid formality.

5- Risks and governance challenges AI in Islamic finance brings risks

Hidden processes inside algorithms can hide how choices are made. Because of this, religious panels might struggle to explain rulings using traditional Islamic principles. When systems do not reveal their steps, aligning them with faith-based guidelines becomes complicated. Understanding the path to a result matters just as much as the result itself. Without clear insight, trust in automated decisions weakens. Religious oversight needs transparency to function properly.

Operational losses sometimes emerge when contracts fail to align with religious guidelines, this mismatch creates what some call "Sharia waste". Though not always visible at first, such gaps often reveal themselves through delays or rejected transactions. Where rules are overlooked, friction follows. Instead of smooth execution, processes stall under scrutiny. Missteps in design or application open doors to avoidable setbacks. When compliance lags, consequences accumulate quietly. Over time, small oversights drain efficiency. Contracts shaped without proper alignment tend to unravel in practice. Errors creep in where oversight is thin. The result? A slow leak of resources, masked as routine difficulty.

Achieving real gains from artificial intelligence hinges on how well it is governed. If oversight lacks collaboration across fields, such as Islamic jurisprudence, computing expertise, and policy design, the result may be little more than surface-level adherence. Without meaningful integration of these perspectives, efforts could amount to procedural gestures rather than substantive progress.

A shift toward artificial intelligence in Islamic finance brings gains, yet opens doors to fresh complications. Efficiency rises sharply, though ethical questions emerge just as fast. Recent research highlights tensions between automation and religious principles. Operational hiccups appear where tradition meets technology. Studies conducted in real-world settings point to strain on core values. Risks pile up quietly beneath surface-level improvements. One benefit arrives paired with unintended consequences. Each advance demands scrutiny through a faith-based lens. Observations from experts suggest growing unease within institutions. Balancing innovation with doctrine proves harder than expected.

5-1- Algorithmic opacity: The "Black Box" problem

Fundamental questions about knowledge arise when opaque systems like deep learning influence Islamic legal decisions. While these complex models operate without transparency, their role complicates how certainty is established within Sharia frameworks. Because understanding relies on traceable reasoning, hidden processes disrupt traditional validation methods. When conclusions emerge without clear pathways, confidence in religious interpretation weakens. Thus, unseen mechanisms in tools such as generative AI interfere with long-standing assumptions about justified belief.

Because Sharia boards must review financial agreements for religious compliance, clarity in how choices are made matters greatly. If the process behind decisions lacks transparency, scholars may struggle to support conclusions using traditional Islamic jurisprudence. Without clear insight, human oversight risks shifting toward automated systems by default. Understanding each step helps maintain accountability within faith-based frameworks.

Sharia adherence rests on moral standards rather than measurable outcomes, setting it apart from standard financial evaluation. Because opacity in algorithmic reasoning can introduce unfairness, alignment with Islamic principles becomes uncertain. Where traditional systems prioritize results, religious conformity demands clarity of intent and process. If machine learning decisions lack interpretability, they risk clashing with bans on unjust enrichment. Unclear mechanisms within probabilistic models might mirror practices forbidden under Sharia law. Ethical consistency matters more than efficiency in faith-based finance frameworks. When inner workings evade scrutiny, the boundary between acceptable and excessive ambiguity blurs. Transparency in design serves as a safeguard against hidden forms of exploitation. Rather than focusing solely on output, religious guidelines emphasize how conclusions are reached. Hidden assumptions in code could unintentionally support conditions labeled unjust. Compliance hinges not on success but on whether methods honor foundational beliefs. Systems that obscure cause and effect may conflict with doctrines opposing deception.

Because machines make choices, people want to see how those choices happen. Some scientists push for systems that show their thinking clearly. This transparency helps religious groups check whether loan ratings or money suggestions follow Islamic principles. Clear models let these boards verify alignment with broader ethical goals in finance. When the process opens up, trust grows without assuming anything.

5-2- Sharia waste: Inefficiency and non-compliance

From real-world observations, take Al Salam Bank Algeria, for example, a unique kind of inefficiency emerges, labeled "Sharia waste".

Sharia waste happens when agreements are not followed exactly as required by Islamic law. Such gaps lead to measurable inefficiencies during execution. When terms drift from religious guidelines, practical losses occur. Deviation introduces friction into operations. Failure to apply contract rules properly results in tangible setbacks. Not sticking closely enough to doctrine weakens outcomes. Implementation shortfalls reflect real-world consequences.

Waste often stems from gaps between technology systems and religious compliance frameworks. When digital upgrades fail to align with Sharia governance, problems emerge. A misstep during contract processing, say, timing or documentation flaws, might void an agreement entirely. That failure brings monetary cost along with weakened client confidence. Broken trust piles up just like unused data. Oversight mismatches feed inefficiency silently. Transactions collapse not because of intent but structure. Compliance hiccups leave behind more than rework, they damage relationships. Digital tools advance faster than ethical checks adapt. What looks efficient on screen may falter under doctrinal review. Errors slip through when teams operate in separate lanes. The gap isn't always visible until something fails.

Apart from affecting balance sheets, misuse of Sharia principles triggers damage to public standing, slipping trust among key observers gradually weakens a bank's right to operate. Though numbers may hold steady, perception shifts erode confidence behind the scenes.

5-3- Governance quality: Substantive vs. Symbolic compliance

A shift toward better outcomes often follows how rules shape decision making within organizations using artificial intelligence. Governance determines whether advantages outweigh drawbacks in practice.

A false sense of alignment might take hold if supervision stays weak, technology could seem to follow Islamic principles while quietly skipping real ethical checks. Oversight gaps may let appearances replace accountability, making adherence look genuine even when it is not. Appearances alone cannot carry the weight of true compliance, especially when scrutiny fades behind polished interfaces. Systems might claim conformity without earning it through consistent moral review. Superficial adjustments often mask deeper shortcomings in practice.

Scholarship points to hybrid architectures as a response. A move gains support, not toward isolated oversight, but shared responsibility across fields. Oversight stretches beyond initial setup; it covers development, choices about data, and checks after systems go live. Instead of siloed roles, collaboration links Sharia experts with analysts and risk specialists. This joint effort follows AI continuously, adapting as conditions change. Integration becomes the anchor, balancing ethical guidance with technical precision throughout.

Most older supervision methods depend on occasional manual audits plus delayed evaluations, these approaches now fall short. Instead of waiting, compliance must flow through artificial intelligence structures from the start. Live digital platforms that include Islamic law rules help catch issues early. Accuracy improves when guidance is built into operations as they happen. Oversight works better when it moves at the speed of technology.

Ultimately, handling these challenges well means Algeria can no longer see AI just as a tool. Governance needs to shift, shaping it instead through social and ethical lenses rooted in Sharia-aligned institutions. Such structures must emphasize fairness, oversight, not leaving decisions entirely to machines.

6- Recommendations

To make AI work well within Algeria's Islamic crowdfunding space, what follows has been suggested:

6-1- Set up financial tech assistance pools

Most Algerian start-ups depend heavily, 81.8 percent, on their own money, showing how banks and lenders avoid backing ventures seen as too risky. A lack of accessible external capital leaves founders turning inward for funds, exposing weak support from conventional finance channels when innovation is involved.

A shift toward focused financial backing could steer Algeria into new territory, dedicated funding mechanisms might emerge alongside the current Algerian Startup Fund, tailored solely for advancing Islamic FinTech integration. Instead of broad schemes, niche pools of capital may spark momentum by addressing religious-compliant tech needs directly. While the ASF exists, it does not fully cover this unique intersection of faith-based finance and digital innovation. A separate stream of support could fill that gap effectively. Direction matters more than volume when deploying resources here. Specificity in financing allows alignment with both regulatory

frameworks and market demand. Without precise instruments, progress risks stalling despite available funds.

Funding innovation cycles often begin with costly early stages, support here enables work on viability assessments, moves into building test versions, sometimes leveraging tools such as WordPress to check real-world response, while also covering specific engineering needs tied to Sharia-aligned applications [540, Case Study].

A push for home-built systems might come through monetary rewards that spark local platform growth, lessening reliance on overseas funding networks while nudging regional academic innovators into motion, just as recent government plans suggest.

6-2- Develop hybrid governance architectures

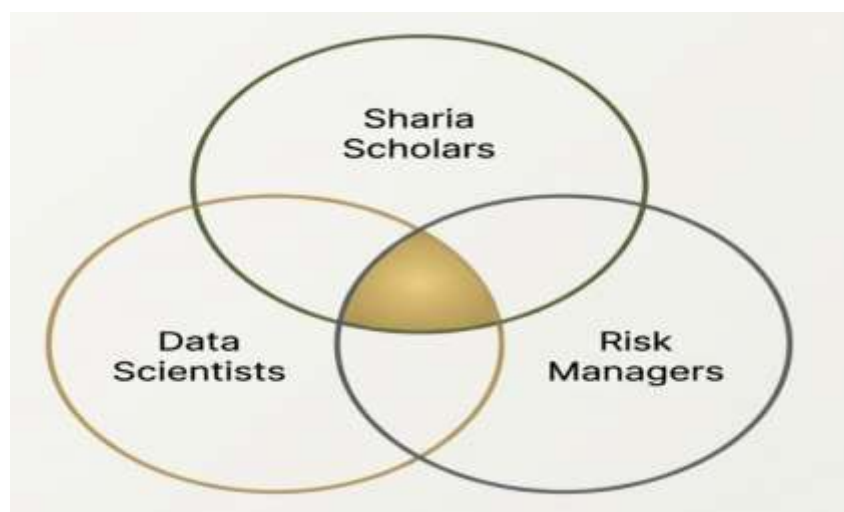
Faced with constant operation and adaptive learning, artificial intelligence challenges old methods of religious oversight built on delayed checks and after-the-fact consent.

Bringing together different fields often works best when religious specialists join forces with those who understand code, law, and uncertainty. Such collaboration helps shape artificial intelligence systems around moral values rooted in Islam right from their earliest stages. Working across boundaries allows ethics to travel along with technology into real-world settings.

Moral oversight across phases gains strength when Sharia councils shape algorithms from start to finish, ethical choices then remain human-led. Rather than handing decisions to code, guidance weaves through each stage. Design reflects values early, reducing reliance on automated outcomes later. Judgment stays anchored in principle, not just process.

Despite growing reliance on algorithms, ethical finance demands clarity. When artificial intelligence guides lending choices or investment suggestions, religious oversight cannot rely on opaque systems. Instead, governance must require transparent models, ones that reveal how conclusions are reached. Because Sharia experts need to assess fairness, they must see inside the machine's reasoning. Only then can rulings verify alignment with core principles: avoiding uncertainty, preventing injustice. Clear logic trails let supervisors check whether digital decisions honor traditional boundaries.

Figure 4: Interdisciplinary synergy model for ethical AI oversight.



Source: Tedjan & Keddi (2025).

6-3- Modernize regulatory frameworks

Right now, Algeria's laws still struggle to match the mindset behind startups and online money platforms. Though built on tradition, the framework hasn't evolved enough to support fast-moving digital finance models. Where innovation moves quickly, regulations often lag behind. A gap remains between how new tech-driven businesses operate and what existing rules allow. This mismatch creates uncertainty for entrepreneurs entering digital markets.

Crowdfunding oversight needs clear direction. The COSOB, among others, should wrap up detailed regulations soon. How people give money online requires defined boundaries. Being called a "contributory investment advisor" ought to have precise meaning under law. Internet-based public funding demands specific guidelines. Rules must reflect real usage, not assumptions. Legal clarity comes from consistent application. Frameworks work best when they adapt quickly. Decisions now shape future access. Oversight gains strength through transparency. Guidelines matter most when enforceable. Structure follows function in regulatory design. Clarity often begins with definition.

When technology moves faster than religious supervision, new rules are needed. Governance frameworks must evolve alongside artificial intelligence in banking systems rooted in Islamic principles. Oversight bodies risk falling behind unless guidelines adapt quickly. Customized compliance models can close gaps between innovation and ethical review. Standards shaped around Sharia requirements help maintain alignment with doctrinal integrity. Without targeted policies, mismatches emerge between digital tools and faith-based scrutiny.

Where law falls behind technology, progress stalls. Updating rules to recognizedigital agreements clears roadblocks in Islamic finance. Outdated processesslow deals; smart contracts speed them up. When systems adapt, time once lostin paperwork finds better use. Rules written for paper fail in a world running oncode. Change begins by treating electronic marks as valid proof. Efficiencygrows where legal frameworks catch up. Without adjustment, old methods choke new solutions. Recognition of digital consent removes friction. Progresswaits not for permission but for alignment.

6-4- Strengthen digital infrastructure

Ahead of broader uptake, tech systems lag behind in Algeria's financial sector, half of banking staff recognize digital tools yet cite outdated setups. Equipmentgaps stand in the way, even when knowledge exists.

Without fast internet, AI systems struggle to operate smoothly. Building strongdigital pathways demands upgrades to cable networks. Reliable connectionsdepend on steady progress in data capacity. For seamless performance,expanding broadband access becomes essential. Progress hinges on consistentadvances in communication infrastructure.

A missing piece? Reliable local cloud infrastructure alongside functional digital payment networks. Without these, building trustworthy crowdfunding solutionsbecomes a steep challenge. Hard to protect data properly when foundationaltech is weak. Security risks rise where homegrown services lack strength.Payment flaws further complicate trust. Platforms struggle to gain footingunder such conditions. Stability matters more than often acknowledged.

Starting with technology upgrades, Algeria might adopt RegTech tools thatallow continuous oversight of financial activity. Instead of delayed reviews, instant audits could become routine through automated systems. With strongersafeguards built into platforms, personal and transactional information staysbetter protected. As a result, users may feel more confident about how servicesalign with both technical standards and faith-based principles. Over time, suchmeasures support a trustworthy digital finance environment shaped byresponsiveness and care.

With these steps in place, progress in Algeria may shift from mere appearancesto a form of Islamic banking that adapts quickly, acts responsibly, yet staysfirmly tied to moral conduct, where how well it works cannot be separatedfrom how right it is.

Conclusion:

A boost in tech-driven Islamic fundraising could support Algeria's emerging businesses. Though faster processes and clearer transactions come with it, progress hinges less on speed than on aligning innovation with faith-based values. Shifting norms require flexible religious oversight that evolves without losing core principles.

- A new tech-driven push to fund Algeria's economic growth now centers on start-ups seen as efficient engines for progress. Still, a major hurdle remains, most entrepreneurs finance their ventures alone, with eight out of ten depending entirely on personal resources. Meanwhile, standard banking channels stay mostly unused because interest-based lending clashes with local norms, collateral demands feel unreachable, and confidence in established institutions runs low.

Now imagine a different path: artificial intelligence shaping Islamic crowdfunding in fresh ways. Through shared-risk tools such as Musharaka and Mudaraba, money flows match community beliefs more closely. Locked assets gain movement here, feeding cash supply while lifting those driven by homegrown campus-led ambition.

- By combining AI with blockchain, operations gain clarity and run more smoothly. Where outdated systems once slowed progress, these tools now offer a clearer path forward. One technology learns patterns, while the other secures records immutably. Together, they reshape how Islamic finance manages trust and speed. Past hurdles in verification and delays begin to fade. Institutions find stronger footing when data flows openly yet safely. This shift does not overhaul principles but strengthens execution. Reliability grows where gaps used to exist.

Because of delays or failure to follow rules, Islamic contracts sometimes become void, AI steps in here. It cuts out what some call "Sharia waste," trimming inefficiencies quietly built into processes. Errors drop when systems check steps before completion. Operations gain accuracy not through speed but consistency. Contracts stay valid because checks happen early. Losses tied to missteps fade as digital oversight grows. Compliance becomes routine rather than rushed.

Through tools like Smart Contracts and automated screening aligned with Islamic principles, agreement checks happen instantly. This cuts delays along with expenses tied to oversight. Execution flows without waiting, thanks to built-in digital rules. Verification runs continuously,

removing long waits typical in manual reviews. Costs drop when systems handle tasks once managed by people.

A fresh wave of access emerges when algorithms analyze patterns to build digital credit profiles. These insights help lenders evaluate young companies without collateral or past loans. So, unconventional ventures gain ground where old systems once hesitated. Risk assessment shifts beyond paperwork into behavior-based signals. As a result, more founders enter the financial landscape who were previously overlooked. Opportunity spreads quietly through data trails left behind.

- Much depends on how carefully values are woven into design. Though artificial intelligence can process vast data, its judgments reflect human choices behind the code. Without clear boundaries, speed in deployment often outpaces reflection. Critical warnings emerge when systems act before ethics catch up

Hidden processes inside algorithms can hide how choices are made. When systems act like sealed boxes, religious reviewers struggle to trace rulings back to Islamic principles. Decisions emerge without clear paths for scholars to follow. Logic gets buried beneath layers machines alone understand. Oversight becomes harder when reasoning is not visible. Interpretation by experts faces barriers they cannot easily cross. Understanding fades where transparency should stand.

A performance without depth might emerge when AI is adopted, showing outward agreement while inner ethical reasoning stays absent. Compliance could turn into theater, with mechanisms mimicking responsibility yet failing genuine oversight. Appearances may satisfy rules, though underlying decisions remain ethically hollow. Systems might follow forms, even as real accountability evaporates behind polished interfaces.

Should people lean too heavily on generative AI, space for personal ethical judgment could shrink. When machines shape decisions, the weight of human insight in interpreting Sharia might fade. Authority built through study and reflection risks becoming secondary to algorithmic output. Thoughtful religious discourse may lose depth if shaped by patterns rather than principles. Real engagement with tradition requires more than generated responses. Without active participation, understanding grows passive. Moral responsibility shifts when answers come preformed. Critical thinking gives way when convenience takes over. A diminished role for scholars alters how guidance is formed. Interpretation guided by code lacks lived experience. Meaning emerges differently when humans step back.

- Success in this evolving financial framework hinges on moving beyond conventional methods, where approvals follow creation, to an ongoing system that monitors every phase. This shift means supervision evolves alongside products, adapting at each stage of development rather than waiting until after launch.

A blend of expertise shapes stronger system designs. Governance that brings together Islamic jurisprudence with technical insight allows moral guidelines to become part of coding logic. When theologians collaborate with analysts and oversight professionals, values are woven into algorithms early. This joint effort ensures decisions within automated systems reflect both religious standards and modern financial scrutiny. Integration happens not through policy alone but by building ethics into the architecture itself.

Boards need clarity on how decisions are made. Using explainable AI helps reveal the reasoning behind outcomes. Because of this, leaders can check whether rules are followed. In Islamic finance, avoiding unclear risks matters a lot. When systems show their logic, fairness becomes easier to verify. Hidden processes might hide unfairness, transparency reduces that risk. Oversight improves when algorithms do not operate like black boxes. Ensuring alignment with ethical limits shapes better governance.

Outcomes shaped by Maqasid demand governance rooted in the broader aims of Islamic law. Justice takes priority when systems serve people, not just returns. Welfare emerges where protections exist for those involved. Profit alone can not guide decisions, higher purposes can. Safeguarding interests becomes central when principles lead. The focus shifts only if equity remains fixed.

Putting it together, if Algeria wants real momentum in startup funding, thinking of AI only as machinery misses the point. Governance of Islamic crowdfunding powered by AI needs attention as a mix of society, values, and rules. Fast digital change works best when paired with flexible oversight that learns and adjusts. Startups then grow in an environment where doing things well means matching efficiency with fairness. Economic variety strengthens alongside societal gains, not ahead of them.

Resources:

Books and theses

- Boukhelf, M. (2023). Essai d'analyse de la problématique du financement des start-ups en Algérie (Master's thesis). Mouloud Mammeri University of Tizi-Ouzou, Algeria.
- Ries, E. (2011). The Lean Start-up: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. Crown Business.
- Thiel, P., & Blake, M. (2016). Zero to One: Notes on Startups, or How to Build the Future. Currency.
- Vernimmen, P. (1988). Finance d'entreprise : Analyse et gestion. Dalloz.

Scientific journal articles

- Benarbia, R. (2025). The legal framework for start-ups in Algeria. Russian Law Journal, 13(1), 929-932.
- Benhadjar, I., & Hassani, A. E. (2025). Islamic Fintech technologies in the era of digital transformation: A future vision for Algeria, A Field Study at BADR Bank and Al BARAKA Bank. Algerian Scientific Journal Platform.
- Djekidel, Y., Doua, M., & Rais, M. (2021). La startup en Algérie : Caractéristiques et Obligations. Revue d'excellence pour la recherche en économie et en gestion, 5(1), 417-427.
- Jaouhari, L., & Bouhadi, S. (2025). L'innovation financière (Fintech) au sein des banques participatives marocaines : Impact sur l'accès au financement des PME. Recherches et Applications en Finance Islamique, 9(2), 119-138.
- Sirine, S., & Bentayeb, H. (2021). Le crowdfunding : un outil de financement pour les startups en Algérie. Études Économiques, 21(2), 448-461.
- Tedjani, M. E., & Keddi, A. (2025). Lean Banking: An Approach to Improve Service Quality in Islamic Banks in the Era of the Digital Revolution, Case Study: Al Salam Bank Algeria. Forum For Economic Studies and Research Journal, 9(1), 374-393.
- Zaid, H., & Derrardja, N. (2023). Le Rôle de la Finance Islamique dans le Développement des Startups. Journal of Economic Integration, 11(1), 360-370.

Regulatory texts and official reports

-Government of Algeria. (2006). Law No. 06-11 of June 24, 2006, relating to venture capital companies. Official Journal, No. 42.

-Government of Algeria. (2020). Executive Decree No. 20-254 of September 15, 2020, establishing the national committee for labeling "start-ups," "innovative projects," and "incubators." Official Journal, No. 55.

-Government of Algeria. (2020). Regulation No. 2020-02 of March 15, 2020, defining banking operations related to Islamic finance. Bank of Algeria.

-Government of Algeria. (2021). Executive Decree No. 21-170 of April 28, 2021, setting the procedures for granting tax advantages to "start-ups." Official Journal, No. 33.

Digital sources

-Algeria Press Service. (2023, January 19). Start-up: over 5000 start-ups identified.

<https://www.aps.dz/economie/150427-start-up-plus-de-5000-start-up-recensees>.

-National Start-up Portal. Startup Label and Ecosystem.

<https://startup.dz/>.