DISTRIBUTED LEDGER TECHNOLOGY
IN THE
NIGERIAN CAPITAL MARKET

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Table of Contents

FOREWORD

The covid pandemic of 2020 acerbated the advance of the virtual world as the physical world shut down. As the virtual advanced, all aspects of commercial activity reawakened to a keen sense of urgency to refresh and remodel processes and service delivery. Transcending regional and physical barriers with the help of technology has become almost unrestricted and concepts of democratised investing have become more popular. With a smart device, potential investors can access a dizzying range of markets and options. Data has become more important as a commodity as has AML and KYC compliance considerations as consumers are increasingly more reliant on technology dependent verifications for the safety of their transactions and daily activity.

Distributed Ledger Technology ["DLT"] has continued to expand the possibilities and there is consensus that the application of this technology is limited only to collective imagination. Nigerians have been quick to respond to this opportunity to access foreign currency denominated investment instruments in the crypto world. Nigeria as a country has gradually become a top player, not necessarily by volume but by number in bitcoin and other crypto investing.

At Sophus Consulting Limited, we intend to curate the progressive preparedness of the capital market community in Nigeria for the advent of crypto investing. We ask the question *'how is the Nigerian capital market preparing to organise, regulate and exploit the trend of growing interest in crypto investing?'* Our approach was to firstly use a live study to track regulator support, operator focus and investor requirements. In keeping this study open, we shall periodically update reports to stakeholders.

For this first report, we conducted a survey among capital market operators and followed up with short interviews for clarification. While all responses to the survey questions are unaltered by us, the comments and deductions are entirely the opinion of Sophus Consulting Limited and does not reflect the official position of any party mentioned in this report. We also recognise that in a highly competitive financial market such as Nigeria, some information may have financial or other implication to respondents and as a result have ensured absolute anonymity for all respondents unless permissioned by such respondent.

Our gratitude goes to all respondents who contributed to this report and all who after reading this report, may make available any further insights and opinions.

BACKGROUND

Satoshi Nakamoto in 2008 first propounded the possibility of a Distributed ledger technology ["DLT"] which would provide a peer-to-peer version of electronic cash. The digital system would cryptographically record transactions and safely store information that cannot be changed unilaterally without a consensus of multiple verifiers. The aspect of multipoint verification is what democratises transactions and ensures a new level of integrity to transactions by removing direct counterparty risk.

Proponents of this technology have always believed that this approach simplifies operations and eases the flow of transactions across borders, regions and time.

Opponents of the technology have always pointed to the anonymity afforded by such a system and the increased possibility of success for nefarious activity. Particularly opposed initially, were regulators and governments who anticipated the effect of reducing control and barriers. Potential clients also indicated a mistrust of a system where regulated intermediaries are absent.

SAMPLING AND BIAS

On the back of the very detailed report from the World Economic Forum in 2021, Sophus formed a survey questionnaire to capture the Nigerian experience that was circulated to capital market stakeholders. The survey remains live and continues to track past and changes in attitude towards DLT. This report will continually be updated with information from the survey as we become aware of any changes.

Our first sampling was taken from regulators, reporting accountants, Market operators, Securities Exchanges, Custodians, Asset Managers, Stockbrokers, Capital Market Solicitors and investing clients (retail and institutional). Settlement Banks and the Central Bank of Nigeria were excluded from this first phase of review as the purpose of this report was to initially highlight the attitude and expectations of the user community and not the service providers to the industry.

We received responses from the full spectrum of work experience i.e. from interns to Board Chairpersons. We believe the breath of the sample rather than the number of respondents lends credence to the opinion expressed herein. In all, we collated responses from over 80 respondents in this first report.

OBJECTIVES

This report will provide insight into 2 basic questions

A) Are stakeholders in the Nigerian capital market ["NCM"] anticipating or actively engaging in the transition to digitalisation?

B) Do stakeholders see themselves (or others) as the drivers of digital transformation of the Nigerian capital Market?

We draw conclusions from the responses to the survey answers received and, in some instances, have interviewed respondents for clarification and quality control. Inferences drawn from this report will also provide useful content in developing a Digitalisation Master Plan and indeed might form a platform for healthy competition while developing the industry infastructure.

Readers should expect to be better acquainted with the level of activity in the Nigerian space and more importantly, re-examine the relevance of digitalisation to their business.

Limitations of this report

i. Non-investment digital products are not included: these are instruments outside the coverage of the Investment and Securities Act 2007 such as digital currencies, SME crowdfunding, cryptocurrencies, non-fungible tokens (NFTs) or decentralized finance (DeFi) applications.

ii. This is not a recommendation of any one product or service as a solution. Readers are encouraged to do their own research before taking a decision.

SUMMARISED INSIGHTS OF SURVEY

Detailed survey review

A Regarding the Nigerian Capital Market structure

- 80% of respondents agreed that market forces supported by regulation creates a compelling case for digitalisation.
- Rulemaking in collaboration with operators is therefore expected to continue

REGULATION REMAINS A RELEVANT CHANGE AGENT

- A consensus that digitalisation would have to be an industry revolution rather than an individual effort sets the tone and platform for collective building and interoperability.
- No respondent considered DLT to be a passing trend that will run out of steam.
- Intermediaries should be prepared will alter processes and interactions to remain relevant

AND ATTITUDE IS POSITIVE

- Most obvious benefit perceived is speed of transactions
- Reliability and risk management were not considered to be high ranking benefits of DLT.
- Multiple use cases for DLT were identified by respondents. The only limit will be user imagination

WILL SOLVE MULTIPLE PROBLEMS

B Transformational Drivers and Challenges

- Intermediaries are expected to be the main drivers of digitalisation. This is despite the common belief that DLT has the potential to reduce client interaction.
- No intermediary confirmed that they had indeed commenced any form of transition.
- Exchanges are expected to be empowered to create niche products, with the proactive support of SEC.

OPERATORS AND REGULATORS ARE DRIVERS

DRIVEN BY COMPETITION

- Most operators are happy to lead market trends in DLT partly due to their awareness of use cases
- Others believe digitalisation should be a combined industry wide initiative and prefer to work alongside the rest of the industry in a comprehensive program.

- The body of knowledge about DLT applications and variants growing at an increasing momentum.
- Over 60% of our respondents claimed to have average or above average knowledge of DTL.
- Further testing by Sophus indicates that this large percentage might be more of a misestimation of the level of activity and quantum of information available.

CONTINUOUS LEARNING IS REQUIRED

THE CHALLENGE OF LEGACY

- Over 65% of our respondents anticipate that dealing with legacy systems would either be too risky, complex or costly.
- Socialisation and careful planning is also required to assist acceptance among old/ entrenched employees.

- A comprehensive program would encourage a greater level of interoperability between operators, Set universally agreed risk management measures and coordinate the priorities of different regulatory bodies.
- 32% of respondents were unaware of any group or party that is leading initiatives
- All agreed that operators and drivers need to be better coordinated

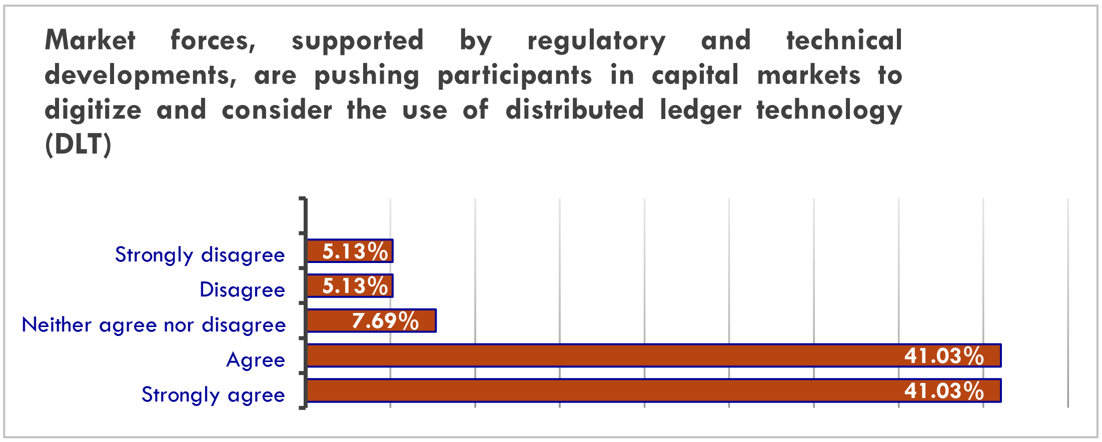
NEED FOR CLEAR LEADERSHIP

DETAILED SURVEY REVIEW

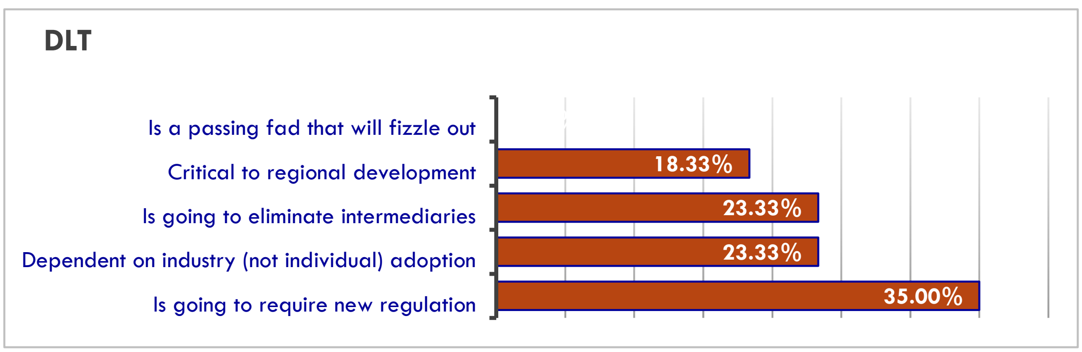
A REGARDING THE NIGERIAN CAPITAL MARKET STRUCTURE

The first two questions highlight the positive reception and indeed eagerness of operators in the NCM to get involved in developing a new market.

1. Regulation remains a relevant change agent



2. And attitude is positive



A significant 80% of respondents agree firmly that market forces with the support of the regulator, the Securities and Exchange Commission ["SEC"] is creating a compelling case for digitalisation. In May 2022, SEC passed the Rules on registration of virtual assets. We assume that respondents who affirmed that regulation is necessary are suggesting additional rules are required as at August 2022.

Around the rest of the world, Regulators continue creating enabling environments through pilot projects, sandboxes and guidelines.

The UK for example has actively engaged stakeholders in developing a framework and after its call for evidence on DLT through its regulatory sandbox which enabled the issuance of equities, bonds and structured products on blockchain.

The Swiss Financial Market Supervisory Authority (FINMA) approved the commencement of operations of the SIX Digital Exchange (SDX) in September 2021; quickly followed by the Hong Kong governments approved the construction of a digital green bond platform in November 2021.

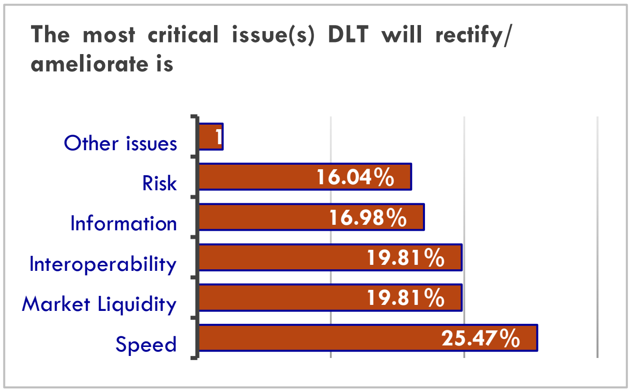
Development continues across the globe in Singapore, Luxembourg and the Caribbean.

We found the consensus that digitalisation would have to be an industry revolution rather than an individual effort rather comforting as this sets the tone and platform for collective building and interoperability. Equally assuring was the fact that no respondent considered DLT to be a passing trend that will run out of steam.

Equally ranked was the belief that DLT will remove some intermediaries from operation. Some respondents considered the report on Geography of Cryptocurrency 2021, which ranked Nigeria 6th out of 157 countries reported upon and reflect that this level of activity and significance was attained without direct intermediaries.

While this survey is not directed at studying the growth of crypto currency trading in Nigeria, we draw inference from the crypto currency industry and conclude that digitalisation of the NCM will alter processes and interactions with intermediaries. We expect intermediaries will be most relevant in areas of AML and KYC compliance and not in trading or advisory services.

3. Will solve multiple problems



Responders were evenly split in their perception of the benefits DLT will bring to the NCM – with speed being the most obvious appreciation (25.47%).

While DLT stores information and enables settlement within near real-time we are of the opinion that storage of large data might still be a problem and retrieval might still be slow.

DTCC's Managing Director, Mike McClain noted in a recent interview that shortened settlement cycles could have significantly lowered margin requirements for clearing agency members and reduced both pro-cyclical margin and liquidity demands. That in turn would strengthen US markets and temper market volatility.

Considering that DLT is reputed not to have a central point of failure, we had expected that reliability and risk management (16.04%) would have ranked higher in respondents' expectation.

Transparency of information again received a relatively balanced representation since information is transparent and totally immutable.

Our survey limited to a choice between 5 use cases or benefits. At the point of interview, we received constructive feedback that many other use cases exist which include:
Real Estate, Artists, Media & Advertising, Supply Chain Management, Detecting counterfeits, Mobility, Health Services, Energy, Data management, Identity Management, Elections and Shareholder Voting, Taxes, Pension management, NGOs and Non-Profit Organizations, Compliance and legislative controls.

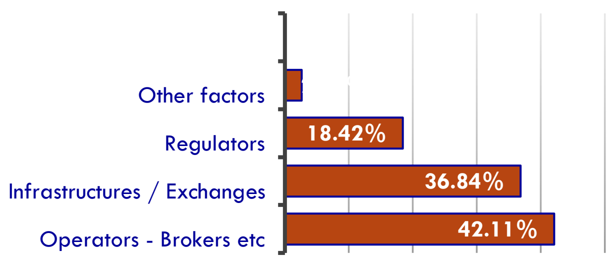
We conclude that DLT is only limited by the imagination of the user.

B TRANSFORMATIONAL DRIVERS AND CHALLENGES

In the second segment of the survey, we were looking for some insight into who were likely to be the leaders of digital transformation. We believe this will be finetuned further in subsequent surveys to identify common characteristics (age, profession, industry etc).

4. Operators and regulators are drivers

Main drivers in digitalisation of the capital market are



42% of our sample population believed intermediaries (brokers, registrars and asset managers) will be the main drivers of digitalisation.

We found this rather interesting as it is commonly expected that DLT has the potential to reduce client (issuer and investor) reliance on intermediaries.

Algorithms have already enabled Robo-advisory services for portfolio management. This has to a certain extent led to a standardisation of service and portfolios, reduction in trading and access fees and providing 24/7 accessibility. Robo-advisory also frees up human brokers to pay more attention to the more specialise / bespoke portfolios. The same could apply to digitalisation – ease of completing transactions, the opportunity to build goodwill with clients by reducing transaction costs and settlement speed. all create a compelling story for intermediaries to embrace digitalisation.

In our follow up interviews, we were unable to confirm that any intermediary had indeed commenced any form of transition.

The second highest category were the infrastructures and exchanges at 37%. For the exchanges, digitalisation creates an opportunity to create a new asset class. In a multi-exchange jurisdiction like Nigeria, it also provides a niche product that may distinguish one exchange from another.

In June 2021, NASD OTC Securities Exchange commenced a pilot run with a pilot team of brokers, settlement banks and custodians to simulate market activity. By November 2021, the exchange had concluded all tests and applied to the regulator for a no-objection to operate the digital market. Nigeria's SEC in response has been quite proactive in working with operators in all innovation. We believe this is in part responsible for 18% of our sample perceiving the regulator to be a main driver of digitalisation.

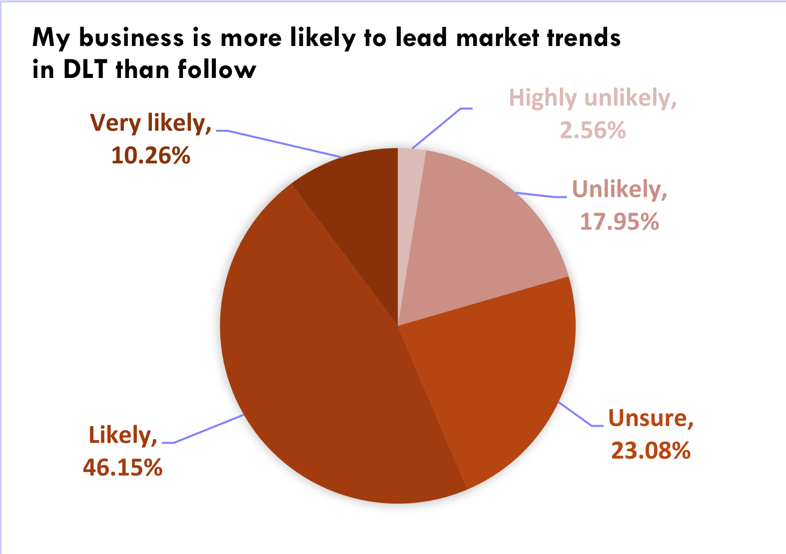
The SEC created and released a framework for trading virtual assets in February 2022. This has effectively removed a significant barrier to widespread adoption of digitalisation of the capital market.

Our respondents placed investors, investment banks and issuers in the other category at 2.4%. They were seen not as direct drivers but beneficiaries and supporters of digitalisation. An increasingly digitalised world would provide the comfort of increased transparency and smoother more secure transactions.

Below we capture the strategic interests of each stakeholder group in digitalisation:

Interest	Lower cost structure	New Asset Class	Improve processes	Transparency	Multi jurisdictional	Liquidity	Business preservation
Regulator							
Infrastructure							
Issuers							
Inv. banks							
Brokers							
Registrars							
Asset manager							
Exchanges							
Investors							

5. Driven by competition



56% of our sample expressed an average to high likelihood that they would rather lead market trends in DLT rather than follow the field. 23% of respondents were not sure if their company would want to be a leader in the DTL space.

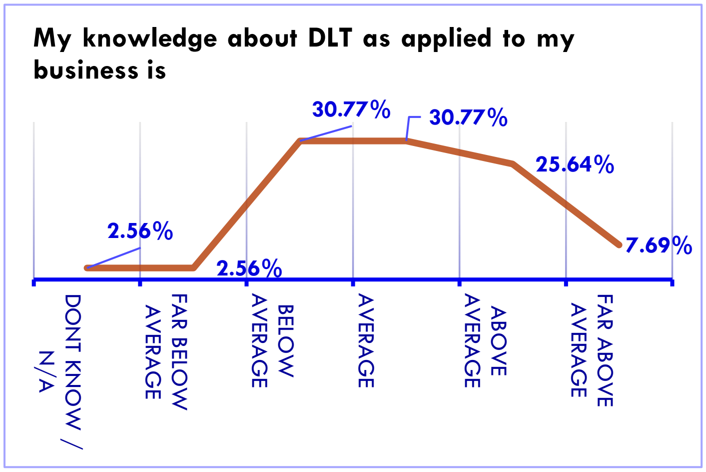
Considering our sample was restricted to capital market operators, we believe the result above reflects a focussed awareness of use cases. As companies become more aware of the possibilities that can be released from DLT for the capital market, a first move advantage would be a powerful and compelling reason to seek to lead the field.

Most respondents anticipate tokenisation of financial securities (i.e., debt, real estate or illiquid assets) would be the fastest growing area and real estate developers have already started reviewing their options in this light.

Further engagement with some of the respondents in the highly unlikely group (2.5%) revealed a rather interesting perspective.

Some respondents in that category consider that digitalisation will commence only as an industry wide initiative. They would rather save time and R&D effort by working alongside the rest of the industry when a comprehensive program commences.

6. Continuous learning is required



62% of our respondents scored themselves with having average and above average knowledge of DLT.

This is an encouraging number, but we note an astonishing array of information about developments in the virtual technology space.

Derived products range across use cases and tools such as decentralized finance (DeFi), non-fungible tokens (NFTs), Metaverse, Web3, securitised tokens, tokenised securities and central bank digital currencies (CBDCs).

We therefore consider responses to this awareness self-assessment a bit less indicative of the true knowledge base and more indicative of awareness of some aspects of one or more specific blockchain-based activity.

As a further test to establish a (non-scientific) margin of error in the average category (30.77%) we inquired about the difference between DLT and Blockchain. Many responded that they were the same!

Below however are the launched and active types of DLT- the last of which came onstream in 2019.

Types of DLT

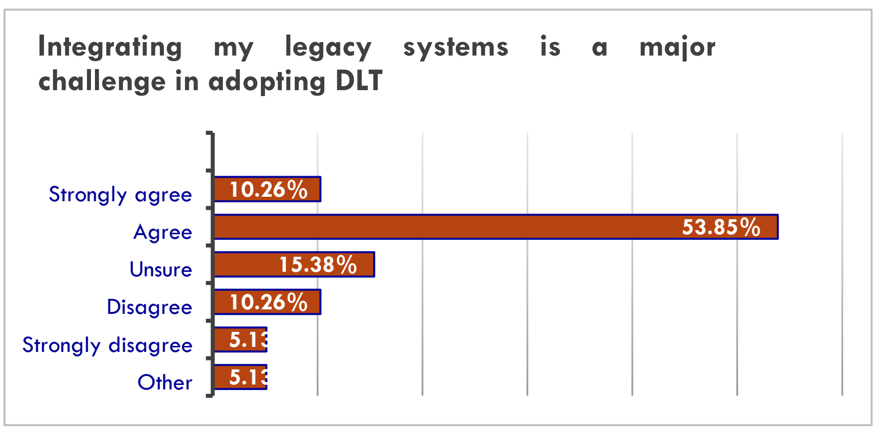
- Blockchain
  - e.g. Bitcoin
- Hashgraph
  - e.g. Swirlds
- Directed Acyclic Graph
  - e.g. Tangle
- Holochain
  - e.g. Holochain
- Tempo
  - e.g. Cerebus

The critical deduction from this response is however the general interest in acquiring more information. CEOs especially are encouraged to acquire more knowledge as this will greatly impact decision making.

Sophus recommends that interested stakeholders in the capital market should pay attention to any of the many podcasts, networking events, workshops and online articles for reference. It may also be useful to sign up to our upcoming newsletters that will digest some of the developments within and outside Nigeria. We also find articles by Coinbase, Blockstation and Fireblock to be particularly informative about developments round the world.

For much deeper study, the open lecture series Blockchain and Money by Prof Gary Gensler the Chairman of the US SEC for the Sloan School of Management is particularly rewarding.

7. The challenge of legacy



Over 65% agreed that the challenge of dealing with legacy systems would either be too risky, complex or costly.

This is consistent with the MIT Technology Review report that determined that 62% of respondents to its survey considered integration with legacy systems to be a major hinderance to moving to a multi-cloud environment.

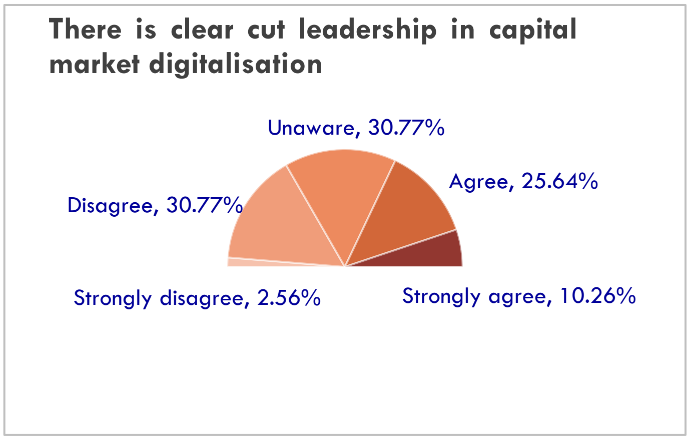
We also agree that transitioning will have to be carefully evaluated, planned out, and managed.

There is also the added challenge of

acceptability of the new technology by old/ entrenched employees. Proper socialisation, finding the right talent and avoiding sacrificing standards and procedures will prove critical to a successful transition.

DTCC's Managing Director, Mike McClain stated in an interview that even though his current infrastructure supports T+1 and limited T+0 settlement cycles, market behaviour, legacy infrastructure and operational processes at client firms make it difficult to accelerate further without a lengthy coordinated industry effort.

8. Need for Clear leadership



33% of respondents were unaware that there was any group or party that was entrusted with leading initiatives in the transition of the NCM.

30% did not agree that there was any leadership while 37% believe there is some form of leadership.

It is commonly believed that a comprehensive program would yield advantages to the digitalisation of the capital market. It would ensure a greater level of interoperability between operators, set universally agreed risk management measures and coordinate the priorities of different regulatory bodies.

Those who believed there is leadership point to the SEC and its recently issued guidelines on digital assets that forms the base of all activity in that space. They also acknowledge that the revised Capital market Master plan – the 10-year agenda for the NCM has recently been revised to accommodate digital assets and virtualisation. This information has however not been adequately circulated to all stakeholders in the market for it to have the required reassurance effect.

Reconciling this to our previous survey question conclusion that operators see themselves as more pertinent drivers than regulators, operators need to form a plan to coordinate all activity.

Numerous associations, groups and parties are at work to develop their individual constituencies. Over a 2-week period in July 2022 for example, there were numerous independent webinars/ seminars and conferences held in the Lagos area alone. In addition, there is a ground swell of tech entrepreneurs each striving to individually wade through the plethora of (sometimes conflicting) regulation. We believe a more cohesive approach would yield more efficient and complementary results.

While there is no consensus on what digital transformation looks like at the national (capital market) level, Malaysia set up a Digital Economy Corporation - a national strategic initiative by the Malaysian Government to encourage and attract companies, talents and investment while enabling Malaysian businesses and Rakyat to play a leading part in the global digital revolution and digital economy. This has happened in other jurisdictions such as UK.

CONCLUSIONS

CRITICAL POINTS FOR THE NIGERIAN CAPITAL MARKET

DLT is in rapid growth mode and is set to revolutionise all investment activity. Based on our survey, we believe the NCM should consider some deliberate action to retain its leadership in the new capital market with the added advantage of reducing (or eliminating) some efficiencies in the system.

Issue	Suggestions
Relevant Regulation	Define an operating framework for crypto investing Finetune rules and align with CBN and other regulators
Harnessing the positive attitude	Inaugurate a market facing coordinating committee to harness the collective intellect of the community. This should include members of the capital market committee
Will solve multiple problems	Steering committee can document and define all use cases. Encourage personal research
Operators and regulators are drivers	Encourage use of sandbox and pilot runs. Current development has stalled and may stifle further innovation
Driven by competition	Cohesive efforts must be made to organise regulate and exploit technology Operators must equip themselves with current and relevant AML and KYC compliance measures
Continuous learning is essential	Institutionalise training among operators Self learning from podcasts, networking events, workshops and online articles is also recommended
The challenge of legacy	Encourage risk, cost and benefit sharing among CMOs. Infastructure platforms to be prioritised over duplication
Clear leadership is required	Inaugurate a steering committee derived from CMC but led by operators

FURTHER STUDY

Our survey has provided interesting insight into the state of readiness of the NCM. We however believe we can focus on any of a wide range.

- Our curiosity is raised for example to the experience of other jurisdictions in Africa.
- We also believe it would be necessary to curate the efforts of the many different groups within the market to remove duplication of effort and more interoperability
- It would ultimately be useful to the market to develop an operating framework that is relevant to all levels of the capital market strata.

We shall however leave the core survey that provided data for this report open. This will allow us glean more robust insight into the requirements and expectations of the market soon. Interested readers can access and take the core survey on our website www.sophusng.com
Readers can also subscribe for updates at www.Sophusng.com

REMARKS

If you wish to share this article or its contents with your colleagues or your social networks kindly drop us a line before doing so.
We look forward to interacting with all market participants; should you have any comments, critiques or endorsements to this article, we would like to hear from you. Kindly send an email to info@sophusng.com or on our comments segment of our website and we shall respond accordingly.

Furthermore, feel free to contact Sophus Consultants Limited should you wish to review your strategy, readiness or form a plan.

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