

African Digital Asset Framework

Peoples-driven Standards for Distributed Pan-African Economies

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ABBREVIATIONS

3IR	Third Industrial Revolution
4IR	Fourth Industrial Revolution
AU	African Union
ADAF	African Digital Asset Framework
AfCFTA	The African Continental Free Trade Area
AIIB	Asian Infrastructure Investment Bank
BRI	Belt and Road Initiative
BRICS	Brazil, Russia, India, China and South Africa
CARICOM	Caribbean Community
CSME	Caribbean Single Market Economy
DPA	Distributed Pan African Economies
DLTs	Distributed Ledger Technologies
EBP	European Blockchain Partnership
EBSI	European Blockchain Services Infrastructure
Foundation	African Digital Asset Foundation
NDB	New Development Bank
P2P	Peer-to-Peer
PRC	People's Republic of China
RTA	Regional Trade Agreement
SADM	Single African Digital Market
SDM	Single Digital Markets
TPP	Trans-Pacific Partnership
TTIP	Transatlantic Trade and Investment Partnership
UNSDGS	United Nations Sustainable Development Goals
USD	United States Dollars
WTO	World Trade Organization

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Peoples-Driven Standards for Distributed Pan-African Economies

Abstract

Open source standards for digital assets and distributed ledgers can support the growth of distributed Pan-African economies. Securely digitized assets remove barriers between *peoples* to securely access and transfer items of value like currency, identities, land titles and votes anywhere around the world. These digital assets carry unprecedented opportunities to create digital trade networks for commerce throughout the continent and among its diaspora. The potential for these Pan-African economies will depend on the standards, policies and frameworks that govern these new technologies. There is a need for a constantly evolving and accessible platform for communities of *peoples* to create standards for digital assets that support the growth of distributed Pan-African economies⁴. We propose the African Digital Asset Framework, the first open source platform to create transnational standards for digital assets and distributed ledger technologies. ADAF is an open repository of standards that encourage self-regulation for how digital assets and distributed ledger technologies are created, used, transacted and managed by policymakers, consumers, entrepreneurs and civil society. Standards can be presented, discussed, edited, and implemented with the goal of encouraging digital asset ownership and value exchange in line with Pan-African sustainable development objectives. The project exists to complement regional economic integration tools for trade and commerce within the continent and among its diaspora⁵.

Introduction

Pan- Africanism is an ideology born to economically and socially unite all *peoples* of Africa, regardless of origin. At its core, Pan-African thought is "a belief that African peoples, both on the continent and in the diaspora, share not merely a common history, but a common destiny"⁶. These ideologies laid the foundation for the African Union (“AU”) and its objectives to create economic prosperity for all *peoples* of Africa around the world.

It is within this context that this paper proposes a project called the African Digital Asset Framework (“ADAF”), the first *open source*⁷ software platform to create transnational standards for digital assets and distributed ledger technologies (“DLTs”) in line with Pan-African development objectives. Digital assets are creating a secure way for *peoples*⁸ to trade across borders in peer-to-peer (“P2P”) driven economies. The continent’s rapid industrialization and digitized economy present a unique opportunity to remove barriers to commerce within the continent and between its diaspora. The platform will act as an open repository of technological and regulatory standards to encourage the responsible creation, use, exchange and management of digital economies by *peoples*, consumers, civil society, entrepreneurs, and policymakers. Standards can be presented, discussed, supported, edited, and implemented in line with

sustainable development objectives of the African Union and similar regional organizations. Standards can be created and used by *peoples*, customized by states and built to facilitate Pan-African trade.

ADAF exists to support the growth of DLTs and digital assets that forge regional and cross-border trade networks between *peoples* of Africa and its diaspora. This paper refers to these networks as a distributed Pan-African economy (“**DPA**”). The opportunity for DPAs is described throughout this paper alongside the need for an open source platform like ADAF for *peoples* to create and maintain Pan-African standards for DLTs and digital assets. DLTs facilitate the secure exchange of digital assets across borders. They ease barriers to cross border trade and can build digital bridges for economic, intellectual, social and cultural exchange between the *peoples* of Africa in the diaspora. Secure and digital cross-border trade opens unprecedented technological opportunities for Pan-African commerce. These technologies are rapidly evolving and exist across national borders. There is a need for accessible and constantly updated standards for *peoples* to drive the creation of transnational standards for digital economies.

Executive Summary

The paper is presented in three major sections summarized below:

1) Section 1: Digital Trade Networks

- a) DPAs can be built with regional tools for economic integration under the constitutive documents of the AU. The tools for digital trade networks within the continent and between its diaspora already exist and are in line with trade patterns in the global political economy. This section presents three patterns that demonstrate DPAs’ opportunity to build digitized trade networks between *peoples* of Africa. The continent’s rising regional trade networks are growing alongside mainstream advances in distributed ledger technologies.
 - i) **Regional Trade** - Regional trade blocs are growing. Delays in the World Trade Organization’s (“**WTO**”) latest multilateral trade negotiations are encouraging the growth of regional trade blocs⁹;
 - ii) **Africa’s Role in Global Trade** - The African continent is leading regional trade in the 21st century with a membership in its first Mega-RTA alongside Brazil, Russia, India, China and South Africa (“**BRICS**”), the signing of its own regional trade area agreement and its project for a Pan-African digital trade network; and
 - iii) **DPAs as Digital Trade Networks** - Digital single markets will be built with DLTs and digital assets. They can facilitate trade between *peoples* in DPAs for Pan-African sustainable development. DPAs can lean on the AU’s constitutive tools for regional integration to create digital trade networks.

2) Section 2: Distributed Pan-African Economies

a) This section describes the three building blocks of DPAs. The African continent is in a unique time in its history; it is experiencing the simultaneous effects of both a Third Industrial Revolution (“**3IR**”)¹⁰ and Fourth Industrial Revolution (“**4IR**”). Digitized trade networks and DLTs will encourage further regional integration and ease the financial, technological and regulatory barriers to trade. DPAs are digital trade networks and can build bridges between an already active diaspora market. DLTs and digital assets can build bridges for DPAs and digital trade networks and will need open sourced standards to create them:

- i) **Economic engine** - The continent can act as an economic engine for DPAs in a digital world. The effects of a 3IR, increased regional trade, Belt Road Initiative (“**BRI**”), and air, maritime and road transportation infrastructure are awakening intra-continental trade. Alongside her industrialization, the continent’s digital economy is poised to extend the benefits of intra-continental trade and leapfrog in the 4IR with its growing mobile usage and population growth;
- ii) **Digital bridges** - DLTs and digital assets can create digital bridges for an already active diaspora to engage in trade and commerce within the continent and between its communities. DLTs and digital assets are the foundation of the 4IR and will accelerate intra-continental trade, unlock capital and build peer-to-peer (“**P2P**”) economies. DPAs will be characterized by digital assets, DLTs and P2P trade. There is an opportunity for cross-border and *peoples*-driven standards that harmonize transnational digital asset standards for Pan-African development;
- iii) **Peoples-driven standards** - DPAs will depend on the technological and regulatory standards that create and sustain DLTs and digital assets. These standards need to encourage compatibility across borders for P2P trade and are built with open source software:
 - (1) DLTs and digital assets present novel regulatory challenges to policymakers and their regulations need to be supplemented by customizable soft law and self-regulation;
 - (2) These novel issues are an opportunity to calibrate transnational approaches with open source standards in line with Pan-African development objectives;
 - (3) Open source communities are people-driven and can emulate principles for the rule of law including access, accountability, equality, equity, integrity, participation and transparency in line with DPAs;
 - (4) Open sourced standards are accessible, constantly updated, encourage, self-regulation, protect consumers and create transparent community-driven standards for the digital economy; and

- (5) Open regulatory and technological standards can complement existing policy approaches.

3) Section 3: The African Digital Asset Framework

- a) This section introduces the ADAF project and its components under development: including how and why it works, opportunities and weaknesses and a brief description of a use case:
- i) **Project** - the descriptions, standards, sectors and the organization's role and values are defined;
 - ii) **Process** - process for submitting and creating a standard and descriptions of the platform and development plans;
 - iii) **Improvements** - strength and weaknesses of the project;
 - iv) **Open Standards for DPAs** - summarizes the relationship between ADAF and DPAs;
 - v) **Pan-African Digital Identity** - we propose a call to action to the community to pilot standards for digital assets and present a potential use case for digital identity standards for Pan-African development.

Section 1: Digital Trade Networks

Trade is increasingly borderless. This section presents a trend and opportunity in the international political economy: a clear shift from multilateral trade institutions to regional digital trade networks, referred to as single digital markets (“SDMs”). Regional organizations like the AU and European Union (“EU”) are creating SDMs to connect their states’ economies with technology platforms. SDMs are the next evolution of regional trade between people and countries because they use technologies to ease cross-border delivery of products and services in line with principles of free trade economics. At the heart of SDMs and these digital trade networks will be the secure transfer of digitized economic value over the Internet.

DLTs are the technological infrastructure for digital exchange of value and will be a core component of SDMs. These technologies allow *peoples* to create secure digitized assets like identities, currencies, land titles and financial instruments that can seamlessly transfer across borders. Trade within the continent and between its diaspora can grow in this digital age with its own SDM. In a digital age, a Pan-African SDM can be built for trade between any *peoples* across borders, including the continent and its diaspora. The tools for a Pan-African SDM already exist, but need to be complemented by open sourced standards for DLTs and digital assets. These standards should be built alongside those tools for Pan-African regional integration under the AU and other similar groups.

The continent’s influence in global trade networks is growing. The AU recently signed one of the world’s largest regional trade agreements, the African Continental Free Trade Area Agreement (“AfCFTA”), and joined BRICS, a mega-regional trade bloc accounting for near a quarter of global GDP and created its own Pan-African SDM, the Single African Digital Market initiative (“SADM”). SADM and digital trade networks will depend on the secure exchange of digital value using DLTs over the Internet. DLTs carry the potential to ease cross-border trade between *peoples* for all kinds of assets with an unprecedented level of cybersecurity. Both the AfCFTA and SADM exist to create economic prosperity for *peoples* of Africa in line with Pan-African sustainable development objectives. DPAs can extend the economic and social tools under the AfCFTA and SADM with DLTs and borderless digital assets to create digitized networks of trade between *peoples* of Africa.

Digital assets can form the foundation of Pan-African trade networks for DPAs. Technological advances in DLTs and digital asset infrastructure will ease barriers to regional trade between common *peoples*. DLTs and digital assets are borderless, and so are *peoples* of Africa within the continent and in the diaspora. A core potential for DPAs lies in the distributed network of *peoples* of Africa around the world in the diaspora. Digital economies and Africa’s growing role in the global political economy present a unique opportunity to energize Pan-African unity with borderless commerce.

1) Multilateral to Regional Trade Networks

Governments are building networks of regional trade blocs as an alternative to multilateral trade groups like the WTO. The shift from multilateral trade to regional blocs is an important pattern in human history.



Trade patterns are an important feature of political economies and can tell stories of development, political power and industrial development¹¹.

Rapid technological advances are disrupting the role of traditional multilateral trade institutions like the WTO¹². Modern conceptions of global trade are founded on free trade economics, which call for reduced restrictions and tariffs to trade between states¹³. In the 20th century, trade patterns focused on reducing tax tariffs and barriers and saw the birth of international multilateral organizations like the WTO. Today, it is easier to negotiate a trade deal among 5 countries than it is among the 164 members of the WTO¹⁴. As a result, trade patterns are increasingly reliant on regional groupings of governments with specialized trade rules¹⁵, thereby reducing the centrality of the WTO's role in international trade¹⁶.

The delays surrounding the WTO are transforming global trade patterns in favor of 21st century trade regionalism¹⁷. In 1995, the world built the WTO as one of the largest multilateral trade blocs, when 164 states signed the *Marrakesh Agreement*¹⁸. The WTO's objective was to “develop an integrated, more viable and durable multilateral trading system”, to “raise standards of living and [ensure] full employment”¹⁹. The WTO acted as a forum for bi-annual negotiations called Ministerial Conferences, where decisions were made with one-country to one-vote consensus²⁰. The latest major WTO Ministerial Conference for negotiations was launched in Doha, Qatar in November 2001²¹ (the “**Doha Rounds**”). The Doha Rounds have still not concluded²². The goal of the Doha Rounds was to broker consensus for trade rules across agriculture, manufacturing and services. The Doha Rounds missed deadlines between 2001 and 2008²³, with the negotiations stalling indefinitely on July 29, 2008 following lack of consensus on agricultural rules²⁴. Attempts by the WTO at achieving international consensus have not been successful, with the most recent negotiations being held in Buenos Aires, Argentina between 10-13th December, 2017²⁵. The Doha Round missed deadlines, failed meetings and technological advances are contributing to a rapid growth in regional trade agreements from 50 agreements in 1990, to over 461 agreements in 2018²⁶.

RTAs are rapidly scaling to larger blocs of free trade areas areas called mega-RTAs (“**Mega-RTA**”) that are determining the future of our global political economy²⁷. The African continent and its states' recent move towards regional trade patterns are keeping up with these trends in the international political economy: (1) the signing of a Pan-African RTA; and (2) an African state is a signatory to a Mega-RTA. Regional trade agreements are defined as reciprocal trade agreements between two (2) or more states (“**RTA**”)²⁸. RTAs are founded on traditional tenets of free trade economics that exist to ease trade barriers and create comparatively stronger commercial and political ties between countries and people that are a part of regional trading blocs²⁹. The devolution of the WTO's role in global trade is creating an opportunity for regional groupings of countries to scale the size of their trading blocs into RTAs and Mega-RTAs³⁰. These larger trading blocs are popularly referred to as Mega-RTAs and the immense sizes of their combined economies are reshaping global political and economic landscape. Countries and regions that are members of these Mega-RTA trading blocs will lead global trade networks in the near future³¹.

2) Africa's Role in Regional Trade

a) BRICS-Africa Trade

Mega-RTAs are “deep integration partnerships between countries or regions with a major share of world trade” that exceed 24% of global trade in goods and services³². These are large economic blocs that are determining the future patterns of our global political economy. A country or region's membership in a Mega-RTA bloc will determine its trajectory and economic growth in a multipolar trade world. Two of the more popular examples of Mega-RTAs are the Trans-Pacific Partnership (“**TPP**”) and the Transatlantic Trade and Investment Partnership (“**TTIP**”). At the time of their negotiations, both agreements were respectively expected to affect a minimum of 25% in trade of goods and services in world trade³³. Both the TTIP and TPP are led primarily by European and North American countries and are subject to stalled negotiations, with the TPP allegedly declared defunct³⁴. Membership in either of the TTIP and TPP would endow members of the regional bloc with access to a preferential market that controls a quarter size of the global economy. Luckily, an African state is a member of an Mega-RTA unprecedented in size and founded by Brazil, Russia, India, China and South Africa, called BRICS. The BRICS countries are made of five major emerging national economies and is the only Mega-RTA to include an African state. None of the BRICS states are members of the TTIP or TPP blocs³⁵.

BRICS states collectively represent over 3 billion people or 41.2% of the world population³⁶ and 23.2% of the world's gross product (US \$40.6 trillion), qualifying it as a Mega-RTA, and one of the major trading blocs in the international political economy³⁷. BRICS' size and network of institutions represent a major shift in our global economy towards emerging nations and South-South trade, led by the People's Republic of China (“**PRC**”) and the Republic of India³⁸. These five countries are projected to be the main drivers of growth in the world's economy by 2030³⁹. The strength of the BRICS trading bloc is supported by institutions like the New Development Bank (“**NDB**”) which are created to support the BRICS trading bloc⁴⁰. BRICS exists alongside the Asian Infrastructure Investment Bank (“**AIIB**”), a multilateral financial institution of 86 member states that aims to encourage regional connectivity and economic growth⁴¹.

The African continent is at the centre of the world's new political economy. BRICS' size, potential, and structure will dramatically transform the global political economy. The PRC and BRICS are building new financial infrastructure for the global economy and represent a marked departure from Western-dominated trade infrastructure like the International Monetary Fund and World Bank. South Africa's membership in BRICS' trade blocs can open its economy and intra-continental trade networks to BRICS trading partners. This will become visible in areas like agriculture, science, growth of financial institutions, and security. Africa's inclusion in a major Mega-RTA is evidence of its efforts to be ahead of developments in the global political economy. In addition to a membership in a Mega-RTA, the continent signed its own intra-continental RTA for Pan-African economic prosperity and trade: the *African Continental Free Trade Agreement* (“**AfCFTA Agreement**”)

b) AfCFTA and Pan-African Regional Trade Area

On March 21, 2018, 44 African states adopted a RTA to create the largest free area⁴² since the signing of the WTO: the AfCFTA⁴³. The AfCFTA covers a market of 1.2 billion people, and boasts a gross domestic product (“GDP”) of USD \$2.5 trillion across fifty five (55) member states of the AU⁴⁴. The AfCFTA’s objective is to create an intra-continental African market for goods and services for the “peoples of Africa and African States” on the continent and in the diaspora in line with the foundational documents of the AU⁴⁵. One of the world’s largest RTAs specifically exists to create economic prosperity for all *peoples* of Africa around the world. The AfCFTA is creating a Pan-African RTA that spans across borders and could provide economic, social and political tools that support the growth of regional organizations like the Caribbean Community (“CARICOM”) and its Caribbean Single Market Economy (“CSME”).

South Africa is a signatory to the AfCFTA⁴⁶ and can serve as an interface for increased trade and commerce between BRICS countries and AU member states. The Pan-African objectives for prosperity under the AfCFTA can be augmented through this relationship. The AfCFTA and South Africa’s membership in BRICS are clear trade patterns that the continent is keeping pace with contemporary trade patterns. These trade patterns show a clear turn away from multilateral institutions like the WTO to regional blocs like the RTA. They are also showing a clear turn towards SDMs and digital trade networks.

Technological advances in trade and the 4IR are creating an entirely new evolution: SDMs and digital trade networks. These markets are meant to act as digitized RTAs that use technologies to connect people, businesses, applications and governments in digital trade networks. The continent is leading the next evolution of digitized RTAs with its own SDM, the SADM. The SADM is being born at the genesis of the 4IR and the maturation of DLTs. We propose that the SADM and DPAs need to be built with DLTs and digital assets to facilitate the digital transfer of economic value across borders. The SADM and AfCFTA create a foundation for digitized trade networks within the continent and among the diaspora. DPAs that use DLTs and digital assets can then extend the economic potential of both the AfCFTA and SADM. Africa is leading the next generation of digitally connected trade networks.

c) Single African Digital Market

The SADM, SDMs and other digital trade networks are the next phase of our political economy. The SADM is a Pan-African single digital market for trade and commerce originally announced by AU Chairperson Paul Kagame⁴⁷. The SADM is built within the goals and parameters of the AU and can act as an extension of the AfCFTA’s goals for intra-continental trade. The constitutive documents of the AU that guide the principles AfCFTA and SADM call for economic prosperity for *peoples* of Africa both within the continent and among its diaspora. SADM and its regional integration tools under the AU provide the foundations for cross-border Pan-African digital economies. The SADM is setting a new standard for regional trade among *peoples* of a diaspora and those on the continent with the tools for distributed and digital regional trade blocs. Digitized borders will reduce barriers to trade and commerce

between *peoples* across borders. The SADM will build the regional integration tools for *peoples* to engage in digital economies to trade assets, purchase goods and services, share data and join ecosystems.

SADM represents a cross-border regional integration initiative for Pan-African development. Multilateral trade networks sought to harmonize rules, RTAs sought to integrate those rules and mega-RTAs scaled the effect of regional blocs. SDMs use technologies to further ease trade barriers and create a *single* market for goods, services, and networks that are created in line with the policy goals of a regional trading group⁴⁸. SADM is created in line with the objectives for Pan-African development and together with technological advances can digitize borders and ease trade barriers between states and *peoples*.

The continent and diaspora are in a unique position to create SDMs to connect *peoples* in line with the tenets of Pan-African economic theory. The AfCFTA, BRICS membership, and SADM are an opportunity to grow regional tools for Pan-African commerce in a digital world. The constitutive documents of the AU are built to increase Pan-African trade across all *peoples*, and the technological advances of the 21st century will empower people to engage in commerce across digital platforms. These platforms can act as bridges. DLTs and digital assets can augment the potential for the SADM and DPAs by ensuring the *secure* exchange of economic value across borders. The SADM and DPAs will need to be built with DLTs and digital assets. The SADM does not currently contemplate standards for using DLTs for Pan-African trade.

The current infrastructure of the Internet does not permit for the *secure* and trusted exchange of economic value. The SADM will be vulnerable to cybersecurity attacks and will need to be built with technologies that facilitate the secure exchange of economic value over the Internet. DLTs and digital assets are creating the required layer for secure exchange of value and will therefore form the foundation of digitized SDMs and cross-border trade. The SADM can build on the AfCFTA's objectives and tools to enable digital networks for Pan-African commerce. The next evolution of digitized RTAs like the SADM will therefore depend on the technological advances in DLTs to support the functions of traditional regional blocs.

d) DLTs and Digital Assets for Pan-African Trade

DLTs and digital assets are the necessary technological infrastructure for digitized RTAs, the SADM and DPAs. The SADM is creating a digital Pan-African trade network but does not contemplate the use of DLTs and digital asset standards for its networks. DPAs are networks of platforms built with DLTs and digital assets that enable the exchange of value groups of *peoples*, sectors, countries and economies throughout the continent and diaspora. These networks can be built alongside the tools for Pan-African commerce under the AU and regional organizations. For example, the technological and legal standards for a DLT-based and Pan-African digital identity can encode the terms of the AU's *Protocol on the Free Movement of Persons* (“**Movement Protocol**”). Common transnational standards for this digital identity could facilitate the movement of goods, services and people in line with Pan-African development objectives under the Movement Protocol. Those standards could interface with digital identity systems of other governments and regional institutions, like CARICOM, to allow residents of CARICOM and the Caribbean to travel freely within the African continent in line with the Movement Protocol. The world is

evolving from paper-based regional trade blocs to digitized networks and single digital markets built with DLTs and digital assets. The European Blockchain Partnership (“**EBP**”) is proof of this trend⁴⁹.

The EBP aims to complement the European Digital Single Market (“**EDSM**”) for the free movement of persons, services, and capital for people to seamlessly engage in online activities throughout Europe, irrespective of their nationality or residence. The EBP establishes the European Blockchain Services Infrastructure (“**EBSI**”), which “support[s] the delivery of cross-border digital public services with the highest standards of security and privacy”⁵⁰. At the moment, the EBP positions itself as an initiative to support the development of DLT technology throughout Europe. The initiative’s potential to create a digital trade network, however, is clear. The *Declaration on European Partnership on Blockchain* explicitly states that it aims to develop “blockchain infrastructure that can enhance value-based, trusted, user-centric digital services *across borders within the [European] Single Digital Market*”⁵¹. The partnership is based on the premise that close cooperation between member states can help avoid fragmented approaches and ensure interoperability and wider deployment of DLTs. The EBP complements the EDSM to create a secure digital regional trading network. There is a need for a similar organization under the AU to create DPAs and extend the potential of the SADM throughout the continent and among the diaspora.

Digital trade networks of DPAs throughout the continent and among its diaspora can be built using the tools for Pan-African trade under the AfCFTA and SADM. The AU was formed to create prosperity for peoples of Africa everywhere around the world in light of “social, economic and political” changes that affected Africans everywhere⁵². The AfCFTA, and AU, are founded on principles of Pan-African theory for the economic, social, and political unity for all Africans on the continent and the diaspora⁵³. The Pan-African theory that underpins the AfCFTA does not distinguish between Africans on the continent and in the diaspora⁵⁴. The AfCFTA is a free trade area that stretches across populations of *peoples* across the world. Africans are distributed networks of *peoples* that create enormous economic wealth for their countries of residence, birth and origin⁵⁵. The following section presents the opportunity to create digital trade networks across the *peoples* of Africa.

Section 2: Distributed Pan-African Economies

DPAs refer to digitized networks of trade between *peoples* of Africa using DLT-based applications and digital assets. DLTs and digital assets will facilitate the transfer of value between *peoples* across the Internet like never before. *Peoples* will be able to transfer all kinds of assets of all kinds *securely* over the Internet for the first time. DPAs are an important innovation that carry the potential to influence regional trade patterns and finally unite *peoples* of Africa in digitized trade networks. The foundations for Pan-African economic theory rest on the belief that *peoples* of African descent share a common history and destiny⁵⁶. However, Pan-African trade has long been riddled by impediments to cross-border trade, especially across the Atlantic ocean between the continent and diaspora. DPAs can encourage the creation of platforms for both efficacious diaspora trade relations and improved intra-continental trade. Along with the growth of digital economies will be the importance of P2P trade. DLTs and digital assets greatly facilitate P2P trade and can create DPAs that allow *peoples* to trade directly between each other without high costs and trade barriers.

In a digital economy, Africa is well placed to create DPAs with the tools of the AU and AfCTA. There are three buildings blocks to support this argument:

1. **Economic engine** - The continent can act as an economic engine for DPAs in a digital world. The effects of a 3IR and growing intra-continental trade, Belt Road Initiative (“**BRI**”), and air, maritime and road transportation infrastructure are enabling industrialization. At the same time, the continent’s digital economy is poised to leapfrog in the 4IR with growing mobile usage and population growth;
2. **Digital bridges** - DLTs and digital assets can create digital bridges for an active diaspora to engage in digital trade networks between them and their countries of residence and origin. DLTs and digital assets are the foundation of the 4IR and will accelerate intra-continental trade, unlock capital, and build P2P trade and economies. DPAs will be characterized by digital assets, DLTs and P2P trade. There is an opportunity for cross-border and community-driven standards that can harmonize transnational rules for *peoples* of Africa; and
3. **Peoples-driven standards** - The potential for DPAs will rely on the technological and regulatory standards that create and sustain them. Those standards need to be calibrated across borders to prevent silos and must be created by *peoples* in an open source environment.

Growing regional trade blocs, the co-existence of the AfCTA, 3IR, 4IR, SADM, and the growth of Afrofuturism and digital assets represent a unique opportunity in the continent’s history to create globally distributed Pan-African economies. These economies will depend primarily on the success of the AfCTA in liberalizing intra-continental trade. Increased trade between countries on the continent could contribute to strong economic growth that can be digitized and shared throughout networks of DPAs.

1) The African Continent as an Economic Engine

The unprecedented wealth to be unlocked through intra-continental trade would allow Africa's continental economy to distribute that wealth throughout digitized trade networks and platforms in DPAs. For example, a Bahamian person can invest in a growing Angolan real estate development using a DLT-based application for securitized real estate assets. We are living through an unprecedented opportunity for Pan-African trade around the world. There are two major trade patterns in the continent's industrialization and economic future: 1) signing of the AfCTA Agreement; and 2) growing transportation infrastructure with the People's Republic of China's investment in BRI projects.

Industrialization through Intra-Continental Trade

i) AfCFTA

The AfCTA is projected to increase intra-continental trade by 52%. This new free trade area represents the continent's growth into advanced stages of its industrialization, reducing barriers to intra-continental trade. Intra-continental trade stood at 11% of total trade between 2007 to 2011⁵⁷. Currently, intra-continental trade stands at 18%⁵⁸. Intra-regional trade stands at 59% in Asia, and 69% for European states⁵⁹. Barriers to trade across African states include expensive intra-continental exports, underdeveloped transport networks, restricted freedom of movement and cross-border rules that are not harmonized for trade⁶⁰. The AfCTA relies on two primary economic tools: 1) eliminating tariffs for intra-continental trade; and 2) facilitating the freedom of movement of labor with an African passport⁶¹.

The AfCFTA is estimated to primarily benefit industrial exports within the continent⁶² and could reduce dependence on external resources and diversify intra-continental trade into manufacturing, agricultural and industrial work, thereby boosting youth employment through small- and medium-size enterprise growth, among other benefits⁶³. AfCTA represents the continent's growth to the fifth of the seven stages of economic integration with an economic union, a fusion of a single common market, freedom of movement and customs union⁶⁴. The next stages would require a continent-wide currency and monetary union. The African continent is on the brink of an economic takeoff and has the potential to increase continental purchasing power and GDP by over USD \$13 trillion by 2050⁶⁵.

A central pillar to this transformation will be the growth in intra-continental transport with air, communication, maritime, pipeline, road and railway connections. Initiatives like the AU's Single African Air Transport Market ("SAATM") and overland and maritime transport infrastructure financings are building the continent's industrialization and its future as an economic engine for DPAs.

ii) Transport Infrastructure and the BRI

Central to intra-regional trade are accessible and connected air, maritime, railway, and road networks and ports⁶⁶. Transportation networks between African states are still underdeveloped, and their growth trajectory are an opportunity to extend the economic impact of the AfCFTA⁶⁷. For example, current

estimates state that strong transportation networks could triple intra-continental trade volumes between Sub-Saharan Africa states⁶⁸. Various initiatives are being built to facilitate transportation networks and present the potential to facilitate intra-continental trade. The harmonization of aviation policies to ease air transport under the SAATM is one of those initiatives.

The SAATM is an initiative to create a single connected aviation market⁶⁹. It proposes for over 23 AU member states to harmonize rules on traffic rights, capacity, frequency, and air travel pricing⁷⁰. The SAATM could reduce air travel costs, ease import/exports and grow direct routes between countries on the continent. The project is expected to produce USD \$1.3 billion to continental GDP and 155,000 new jobs and is already supported by 23 countries⁷¹. The continent handled over 180 million passengers in 2015, and estimates that over 5 million more passengers will be able to afford travel around the continent⁷². Alongside the growth of air networks are investments in overland rail and road infrastructure, strongly supported by the PRC's investment in cross-continental transportation networks.

Alongside air transport networks is the growth of the BRI project and financing for maritime and overland networks between and within Africa, Eurasia, and the Middle East. The BRI is an infrastructure project that aims to create an economic belt throughout Eurasia and Africa with pipelines, ports, and railways⁷³. Key to the BRI are maritime routes in Central, East and West Africa. For example, Kenya's port at Mombasa is directly in line with the BRI's transport networks⁷⁴. This has led to discussions of a 'second belt' being built through the PRC's cooperation within the continent, with funds invested in railway connections in countries like Angola, Chad, the Democratic Republic of Congo, Djibouti, Ethiopia, Senegal, Tanzania and Zambia⁷⁵. Maritime, road, and rail infrastructure through the BRI and PRC's investments are contributing to cross-continental transportation⁷⁶. The BRI and growth of transportation networks are an opportunity to facilitate cross-border trade within the continent and contribute to Africa's growth as an economic engine for DPAs⁷⁷. Other factors contributing to the continent's growth will be increased trade between the African and BRICS states, rapidly rising young populations, smartphone uptake, increased agricultural production levels, and energy efficiency⁷⁸.

Africa's P2P Digital Economy in the 4IR

The African continent is industrializing and arguably experiencing its third industrial revolution, the 3IR⁷⁹. In addition to this growth, BRICS-Africa trade is projected to reach several trillions by 2030 and can account for 45% of African trade⁸⁰. The scalability of the continent's industrialization and intra-regional trade is still unknown. The continent is at a unique time in its development, experiencing the effects of both its own 3IR and fourth industrial revolution, the 4IR. The 4IR is characterized by rapid technological advances. The continent is poised for rapid development under these circumstances, much like its digital economy leapfrogged the Internet and mobile economy.

Nearly one billion Africans seized the Internet's potential and transformed their lives with access to mobile devices and Internet connections. The Internet was the genesis of the continent's digital economy and provided access to global markets of information. The African mobile leapfrog revolution brought the success of mobile money, the foundation of P2P transfer of digital assets like currency. Sub-Saharan Africa is home to over 338 million mobile users, equal to half of the global mobile money market with

users growing by nearly 20% every year⁸¹. Africa saw about 1.2 billion transactions, worth close to \$20 billion in 2017 alone⁸². Kenya saw over \$68 billion in p2p mobile money transfers last year⁸³ and Kenyan citizens use mobile devices to pay for education, electricity, invest, save, and even take loans⁸⁴. The mobile industry contributed 7.7% of Africa's GDP in 2016, amounting to about \$110 Billion. This is expected to rise to \$142 Billion by 2020⁸⁵. Customer adoption of mobile money on the continent is an example of successful P2P transfers of digital assets of value over the Internet⁸⁶.

DLTs, colloquially known as 'blockchain' technologies, are software protocols that enable the *secure* digitization and transfer of economic value over the Internet for the first time in human history. DLTs also make it possible for anyone to create irreplicable digital representations of real-world value, referred to as digital assets⁸⁷. In the P2P sharing economies of the 4IR, *peoples* have the opportunity to trade directly with each other using DLT applications, ecosystems and platforms. The network and security design of these technologies allow them to grow *exponentially*, and this can be measured by the volume and frequency of digital asset transactions⁸⁸. The wider and faster the networks, the larger their economic value grows. Countries with rapid growth of connected devices and mobile devices can grow exponentially with strong P2P networks and mobile-first users. Together with growth in industrialized intra-continental trade and digitized economies in the 4IR, African states are positioned for exponential growth in the 4IR. This growth can be supported by a wide mobile-first user base, P2P trade and common legal and technological standards for DLTs and digital assets.

Growing young populations, mobile-first users, smartphone usage and P2P economies in the 4IR will drive the continent's digital economies⁸⁹:

- There will be 634 million unique mobile subscribers on the continent by 2025, rising from 444 million. This only represents a 52% penetration rate as a percentage of the population⁹⁰;
- Over 300 million people on the continent will be connected to the internet for the first time, primarily accessing digital services through mobile networks⁹¹;
- nearly 90% of the continent has access to a minimum of 2G networks;
- Smartphone prices fell by 56% between 2012 and 2017⁹²;
- In Kenya alone, USD \$12.08 billion was transacted in mobile money transactions in 2017, with 480, 585, 622 mobile money transfer transactions⁹³,
- There are over 121.9 million active mobile money accounts in Sub-Saharan Africa continent, and total transaction volume of over USD \$1 billion⁹⁴;
- There will be 263 million young people to fill labour gaps in the continent's economic system by 2025⁹⁵.

At the center of the 4IR and Pan-African digital economies will be the transfer of digital assets of value over the Internet, such as identities, currencies, financial instruments, land titles and votes. These assets will be accessible through any device. Anyone with a mobile device will be able to seamlessly engage in global markets, lowering the barrier for small and medium enterprises ("SMEs") and *peoples* to independently create wealth and transparent tax revenue⁹⁶. The 4IR represents the digitization of human behavior and rapid technological advancements in ubiquitous computing, DLTs, artificial intelligence ("AI"), drones, autonomous vehicles, nanotechnologies, 3D printing, energy storage, internet of things ("IoT"), and big data. The 4IR is evolving at an exponential rate, faster than any previous industrial

revolution in human history⁹⁷. This revolution will build bridges between physical and digital applications led by immense growth in use of IoT technologies and DLTs⁹⁸. DLTs and digital assets facilitate the secure exchange of digitized value through P2P networks across borders⁹⁹.

The computational backbone for the new Internet will be built with DLTs and digital assets. Africa's economy will depend on the use of DLTs and digital assets to extend the impact of intra-continental trade, to unlock capital, and create P2P economies between *peoples*.

Digital Bridges for DPAs

Digital assets

The computational backbone of the 4IR's Internet will be built with DLTs and digital assets. These technologies are core building blocks of the SADM, DPAs and Africa's mobile-first digital economy. These technologies can support the growth of intra-continental trade, digitize and liberate capital for *peoples*, build digital trade routes with the diaspora, and encourage P2P sharing economies. DLTs provide for secure trade over the Internet and will reduce the financial and logistical friction across borders. DLTs enable secure supply chain data, automated compliance, know-your-customer/ Anti-money laundering (KYC/AML) checks, transparent tax revenue collection and trade financing that can support intra-continental trade under the AfCFTA¹⁰⁰. In addition to increased intra-continental trade, DLTs and digital assets will liberate capital for *peoples* to own, access and transact digitized assets.

Securely digitized versions of real-world assets can liberate capital across the continent and in the diaspora. For example, a person can create an immutable record their land title with DLT software to prove ownership and collateralize or dispose of their land¹⁰¹. Records of any asset can be digitally recorded and empower people to freely own their assets and engage in a global economy. Secure digital assets like identities, land titles, and financial instruments could distribute financial opportunity to billions of *peoples* with mobile devices. DLTs enable anyone to own their autonomy and securely create, own, use, and transact digital assets in a P2P economy. *Peoples* will be able to own identity, data, healthcare records, finances, and credentials with a mobile device¹⁰². Trusted ledgers built with DLTs can facilitate P2P trade and connect people across any border in the world¹⁰³.

Digital assets, DLTs and regional trade blocs with tools like the AfCFTA can connect *peoples* of Africa to trade securely over the Internet. Digital assets empower accessible and open trade for *peoples* to trade directly. P2P and sharing economies are creating new business and governance models in the 4IR and for *peoples* of Africa¹⁰⁴. Digital assets are not restricted by borders. DLTs and digital assets are built as a layer on top of the Internet and can therefore be transferred anywhere in the world. Africans are a distributed people that can build two-way digital bridges for economic exchange and trade between the continent and its diaspora. The African continent can grow as an economic engine in a digitized world to distribute economic value with and between its diaspora.

Diaspora Trade and Commerce

Peoples of Africa are a distributed people, existing throughout every continent in the world. There are over 140 million members of the African diaspora, according to the latest statistics released by the World Bank in 2011¹⁰⁵. The opportunity for DPAs is inspired by the unprecedented potential of digitally uniting millions of those millions of culturally and economically connected *peoples* across the world. The economic and trade potential for diaspora communities of the African continent is well documented. Over USD \$38bn in remittance inflows entered the African continent in 2018¹⁰⁶ and over US \$53bn is saved annually by the diaspora, which can be reinvested into the continent¹⁰⁷. Remittance flows into the Caribbean and Latin America also amounted to over US \$75bn¹⁰⁸. Members of the diaspora are often better placed to trade with the continent, transfer intellectual property and take investment opportunities in their countries of origin¹⁰⁹. A diaspora market already exists that can be supported by new technologies to further reduce impediments to cross-border remittances and trade. For example, Sub-Saharan Africa is one of the most expensive regions in the world to send remittances at a 9.4% cost average per transaction¹¹⁰. This amounts to nearly 20% higher than any other region in the world. The cost of a remittance using a DLT platform could be less than a few pennies, or even free. DLTs and digital assets are already significantly reducing these barriers to trade.

DLTs hold the potential to unlock value for Pan-African economies by removing barriers to cross-border trade within the continent and between its diaspora. For example, digital assets like cryptocurrencies have already significantly reduced remittance costs for diaspora communities¹¹¹. Companies like BitPesa have transacted over 560,000 transactions and USD \$150m¹¹² within and throughout 7 African countries and diaspora communities. DLT-based applications can facilitate the transfer of finance at a fraction of the cost and time, anywhere in the world, and through any Internet-connected device¹¹³. Digital assets of all kinds can be as fluidly and inexpensively movable as cryptocurrencies. They will be freely accessible through mobile devices, and empower *peoples* with access to a global market for P2P trade. Digital assets can liberate cross-border trade between *peoples* of a Pan-African community.

Africa's potential for exponential growth in the 4IR will depend primarily on how the standards for DLTs and digital assets are regulated, created and maintained. The combination of DLTs and digital assets, with tools for Pan-African development can create building blocks for DPAs.

Accessible technological and legal standards for DLTs and digital assets would support the growth of DPAs and build digital bridges for mutual economic growth within the continent and between its diaspora. The growth of a P2P digital economy in the 4IR creates novel regulatory challenges to traditionally centralized forms of public-sector rule-making. These challenges are an opportunity to consider a role for open source standards in Pan-African digital economies¹¹⁴. *Peoples*-driven decision-making in an open source environment could calibrate harmonized standards across African states and *peoples* around the world. Calibrated standards can reduce the friction of cross-border trade between the communities that create and follow them. These standards could be measured and calculated according to Pan-African sustainable development objectives under the AU, Agenda 2063 and United Nations Sustainable Development Goals (“UNSDGs”).

Peoples-Driven Standards for a Digital Economy

The continent's rapid political and economic development requires urgent legal reform to capture the potential for DLTs. Unfortunately, the challenges posed by these new technologies are creating fragmented approaches to regulation across different jurisdictions on the continent and abroad¹¹⁵. Fragmented regulations limit the potential for digital assets to move across borders and can restrict P2P trade, digital autonomy and DPAs. Digital assets are jurisdiction-agnostic. There is a need for tools to create digital standards across a distributed community of *people* that can supplement frameworks created by regulators.

Digital assets provide for borderless economic exchange of value and are reshaping traditional conceptions of state legal systems¹¹⁶. The 4IR and DLTs are both a technological and regulatory revolution that are presenting five legal challenges to policymakers. Firstly, most legal systems need to be massively reviewed as the current legal systems are primarily built around economic exchange in a non-digitized world. Secondly, the 4IR and DLTs need to be driven through strong public-private sector cooperation and self-regulation, since they require the combination of both technological and regulatory standards. Thirdly, DLTs are largely the result of borderless, community-driven open source projects that rely heavily on accessible data. Fourthly, DLTs and other technologies are evolving *exponentially*, presenting a challenge to lengthy paper-based policy-making procedures. Lastly, since standards for digital assets and 4IR economies will be P2P and consensus driven, there is a need for an accessible digital platform for anyone with a mobile device to participate in the creation or editing of standards. Since DLTs create autonomy for *peoples* to hold and transact their assets, the standards for those P2P economies should be created by them.

DPAs require *peoples*-driven standards that are created and accepted by communities across jurisdictions. Multiple standards could be developed by stakeholders across *peoples* of different languages, legal systems, tribes, industries, and countries. A digital Pan-African economy necessitates a novel legal approach to distribute rule-making and resource-sharing between *peoples*. That novel approach could be achieved with an open source digital platform for *peoples* to create standards for Pan-African digital economies. An open source approach could calibrate standards to the diverse context of a distributed Pan-African people¹¹⁷. Those standards in an open sourced community could uphold Professor Makau Mutua's seven principles of access, accountability, equality, equity, integrity, participation, and transparency in the rule of law for Pan-African development¹¹⁸.

Open Source Platform for DPAs

Publicly accessible technological and legal standards accepted and implemented by *peoples* and policymakers could harmonize cross-border rules for DLTs, digital assets and Pan-African sustainable development objectives¹¹⁹. Content for self-regulatory standards can also be created in an OSO¹²⁰. An open source software (“OSO”) should be used to create technological and legal standards for digital assets and DLTs. OSO platforms are digital platform that allow anyone with an internet connection to publicly access and modify information in a P2P environment¹²¹. Resources are owned by all members of the

community and groups can share, edit, and adopt standards freely. OSOs for technological standards are common, examples include the wide success and scale of open sourced DLT protocols¹²². This paper proposes an OSO for both technological *and* regulatory standards, where those standards are built to encourage to encourage Pan-African economic prosperity.

An OSO to build standards for distributed Pan-African economies could encourage cross-border calibration between rules, technology, *people*, regulators and stakeholders. Professor Carol Neube presents a proposal for customizable and open educational resources as a way to *calibrate* rules across the continent for Pan-African development¹²³. OSO movements are built on principles of accessibility, openness, consensus, due process, open intellectual property rights, accessible use, and communal support¹²⁴. These principles are directly in line with traditional models of governance among African *peoples*. Building DPAs and enabling digital bridges for trade between the continent and its diaspora will require common standards across diverse communities. Calibration across P2P groups is important to achieve this, and an OSO can provide the tools for customizable standards and resources to harmonize rules across the continent in line with Pan-African development objectives. These standards can create the computational, technological, and regulatory backbone for the continent's SADM and DPAs for Pan-African trade.

We propose the **African Digital Asset Framework**, the first open source platform to create transnational standards for DLTs and digital assets. The ADAF is a platform and open repository of standards to encourage self-regulation for how digital assets are created, used, transacted and managed by policymakers, consumers, entrepreneurs, and civil society. Standards are presented, discussed, edited, and implemented with the goal of encouraging digital asset ownership and value exchange in digital economies between the peoples of Africa across the continent and diaspora.

Section 3: African Digital Asset Framework

ADAF exists to forge Pan-African trade through DPAs. This section summarizes the objectives, process, governance model and the strengths and weakness of ADAF. The project is building an OSO platform for communities to create technological and regulatory infrastructure for P2P-driven digital economies. ADAF is an open source platform that can be used to create standards for all kinds of technologies. The initial versions of the ADAF platform will focus on standards for DLTs and digital assets as one of the primary driving forces for DPAs. The decision to focus on these technologies is informed by the urgency to prevent fragmented and permanent rules across states, as well as the opportunity to create *peoples*-driven standards. We propose that ADAF can serve as the infrastructure for standards for the SADM and provide the backbone for the continent's development in a digital age. The ADAF project is iterative and will evolve with contributions from the Pan-African community on its development.

The Project

ADAF's platform is structured to enable accessible and dynamic changes in standards for a digital economy. The ADAF platform and process will work similarly to Github, a distributed and open space for developers to propose and edit code. The ADAF model is built around digital asset standards and DLTs, and will be scalable to incorporate all kinds of resources for a Pan-African digital economy. The ADAF platform will display three categories of information: 1) Standards - technological (software code) and regulatory (policy) proposals for different sectors; 2) Data - open data on standards and Pan-African sustainable development objectives; and 3) Thought Leadership - articles, information, opinions and research on digital Pan-African economies.

The ADAF platform aims to offer a multilingual space for *peoples* to propose solutions, actions, and standards of self-regulation in line with developments in the digital asset and DLTs space. Individuals, civil society, entrepreneurs, and policymakers will be able to access an ADAF platform and submit standards in an open environment. ADAF's open source community will prioritize collective creation and ownership of intellectual property and associated rights⁹. Open innovation refers to co-created ideas, concepts and designs or to inviting the contribution of ideas (crowdsourcing is one example)⁹.

Anyone is encouraged to write, edit, and propose standards. The ADAF platform and model is extendable to all kinds of technologies in Africa's digital economies and the 4IR, including drone technologies, IoT, AI, energy efficiency, big data, and agritech.

African Digital Asset Foundation

Role

ADAF's platform is provided through an open source license maintained by a trust called the African Digital Asset Foundation ("**Foundation**"). The Foundation will be comprised of a Pan-African team and network of community organizations. The structure is comprised of a core team, advisors and

ambassadors that will support the community with research on Pan-African economic and social tools. ADAF's research team will support the community with research on Pan-African economic and social tools under the AU and regional organizations, openly accessible data and sourced thought leadership. The project also aims to offer translation services for standards submitted on the ADAF platform. Research and data will be used to inform standards created by ADAF platform users, and will abide by principles of openness and transparency.

The team's role will be to maintain an active community and provide research and development on Pan-African sustainable development objectives for standards contributed to the community. The ADAF platform's success metrics will be measured against sustainable development objectives under the AU's Agenda 2063, the UNSDGs, and national development plans in member states. The ADAFoundation team and community will work directly with regulators, policymakers, and communities to implement standards created through the platform.

Values

The ADAFoundation and platform will be driven by eight (8) values for Pan-African sustainable development:

- **Access** - Pan-African communities are multipolar and cultural, and the platform aims to accommodate for *peoples* of any background;
- **Accountability** - work closely with policymakers and communities to ensure that digital economies are created to empower *peoples* and facilitate P2P trade;
- **Calibration** - all standards and research will be provided in the aim of harmonizing rules across borders, communities and sectors. The organization and platform is driven to facilitate Pan-African trade throughout the continent and its diaspora.
- **Equality** - the project aims to create access to equal opportunity for all *peoples* and we encourage and emulate participation from people of diverse tribal backgrounds, religion, cultures, states, genders, languages, and groups;
- **Equity** - the platform and Foundation is open source and standards/contributions are owned by contributors and the community;
- **Integrity** - the platform will encourage and respect for *peoples* and encourage a narrative for Pan-African development that focuses on opportunity and projects agency, autonomy, and independence. DLTs and digital assets empower *peoples* to hold and own their assets autonomously in a P2P economy;
- **Transparency** - open source platforms are transparent and work closely with communities to encourage sharing and open information; and
- **Participation** - contributions can be sourced from any interested party around the world.

Product

Contributions

Contributions are encouraged from partners and the community, and are categorized by standard and sector. The community is encouraged to share standards that facilitate trade across DPAs. Standards can be contributed in the following categories:

- **Standards** - these are technological and regulatory standards for the digital economy:
 - **Technological** - these standards are composed of codes, commits and branches for the digital economy. For example, partners can contribute smart contract protocols for decentralized applications that can be edited and commented on by the community;
 - **Regulatory** - policies, compliance standards, legal templates/contracts and open source information on regulatory approaches can be submitted.
- **Open data** - ADAF will support contributions for open data on the digital economy to support data-driven decisions and technologies for social good; and
- **Thought leadership** - communities are encouraged to share scholarly articles, research and content on Pan-African digital economies from around the world.

Sector-Specific

ADAF aims to be inclusive and capture various aspects of Pan-African economies. Contributions will be encouraged and provided through different sectors, including the following non-exhaustive list:

- Access to justice;
- Agriculture;
- Blue economy;
- Civil society;
- Cultural preservation;
- E-commerce and consumer goods;
- Education;
- Entertainment and media;
- Environment and energy;
- Financial services;
- Insurance;
- Healthcare;
- Infrastructure;
- Manufacturing;
- Mobile economies;
- Peace and security;
- Political affairs;

- Rural economy;
- Telecommunications;
- Transportation;
- Women, gender and development.

The Process

The process for submitting standards will have seven major steps:

- 1) Submissions - proposals are submitted using the templates provided by ADAF;
- 2) Proposals - proposals are advocated for through communication channels (Whatsapp, Telegram) by the submitting user;
- 3) Linking/Double Linking - Community participants can directly engage with others to reach a consensus on a particular proposal. Partners may hold *ask me anything* (“AMA”) video sessions and share educational infographics to advocate for particular proposals;
- 4) Support - Proposals are ‘backed’ on the platform and supported by the community, as standards that they use and implement in their technologies or policies;
- 5) Counter-proposals - If two or more organizations cannot agree on a particular proposal, covering a given sector, counter proposals are forwarded. Stakeholders may support any proposal, all proposals are archived and available;
- 6) Backing - Stakeholders may back any proposal on the platform and widely supported proposals will be directly forward to networks of public sector groups, regulators, and private-public partnerships. Proposals are ranked by the amount of backing received and stakeholders may implement any of those proposals; and
- 7) Implementation - Stakeholders and ADAF will work with relevant groups to implement and use the technological and legal standards in their applications or policymaking initiatives. Users may implement a proposal or any part thereof, according to their local cultural, social or political contexts.

Governance

The first versions of the ADAF platform will provide for an open website and repository of standards, data and thought leadership and will be released between Q1 and Q2 2019. The community will be able to create profiles and submit standards, as well as participate in communication channels. Subsequent versions of the ADAF platform and governance model (“**Governance Model**”) will use DLTs in the decision making process with virtual tokens and votes to incentivize quality standards and disincentivize bad actors against the system. A traditional vote on the platform today can be a vote on-chain tomorrow. ADAF’s vision is to build on the benefits of an open network for an accessible decentralized autonomous organization (“**DAO**”).

DLTs and DAOS can reinvigorate ancient models of grassroots communal decision making across traditional societies in villages in townships like the Songhai Kingdom, Bornu Empire, Yoruba, Abawanga, Nyamwezi, Abagusii, Ameru, Agikuyu and Akamba. Consensual forms of distributed decision-making on platforms such as ADAF are not new to Pan-African communities. Successive waves of formal institutional change that took place during Africa's colonial and post-colonial history have been unable to uproot the influence of traditional leaders. Some of these leaders still have influence in African political systems today as they represent the aspirations of the people through the bottom-up approach to politics⁴. Decentralized governance as a concept is relived in African societies in the form of federal states, local governments and devolved governments.

DLTs for ADAF's Governance Model are an opportunity to use tools like liquid democracy and delegated proof of stake in line with the eight values of ADAF: access, accountability, calibration, equality, equity, integrity, transparency, and participation. The Governance Model will be an iterative process and the model, token structure and incentives will be built together with the community and using data from the performance of ADAF's first versions. The Model allows *peoples* to leverage current technologies such as the internet and mobile devices to establish digital asset standards for Pan-African communities. By leveraging these technologies, digital asset standards can scale faster through a continent that is home to 750 million unique mobile phone users. Digital inclusion defined as the expansion of global connectivity and mobile internet adoption, will be key to the establishment of a successful digital asset economy on the continent.

With such rapid acceleration in technology and entrepreneurship, Africa needs standards that can morph based on the changes brought about by disruptive technologies. Pan-African standards also need to use a bottom-up approach that encourages self-regulation if they are to survive the rapid technological changes of the 21st century. This is the only way Africa can ready itself for the 4IR.

Governance Structure

The Foundational Governance Framework will provide guidelines in regards to the exchange of proposals between organizations. The initial guidelines and code of conduct will govern the first versions of the repository platform and will include:

- **Prohibited actions** - proposals or contributions that promote hate or any form of discrimination are banned and discouraged;
- **Permissible actions** - actions that are permissible between community members; and
- **Backing** - community members are encouraged to freely support proposals and standards on the platform.

At a later stage when proposals increase in number, the platform can be scaled to augment quality contributions and values. Subsequent features to be introduced for distributed governance include:

- **Mobile compatibility** - the platform will integrate mobile survey application program interfaces (“APIs”) to enable anyone with a mobile device to easily vote and participate in standards making on the platform;
- **Compositionality** - using an algorithm to fractionalize voting and permit any body to vote and participate;
- **Incentivization** - the platform aims to introduce tokens and an incentive model for the community that encourages quality contributions to standards, open data and thought leadership. Tokens will also eventually be used to facilitate value exchange on the platform as well as for token curated registries - to rank and rate standards for the community. The token model is being built in accordance with the performance of the platform and will only be introduced and launched after extensive analysis of the community, sustained performance of the product and community demand and supply; and
- **Relative majority** - the approval process for standards will eventually be open to a relative majority as opposed to a full majority.

Strengths of the ADAF

1. **Living** - Standards in an open source community can be maintained and updated to the latest technological, regulatory, and social developments. These standards are robust and can complement more lengthy policy making procedures by the public sector;
2. **Peoples-driven standards** - ADAF is P2P driven, providing a means for people-driven rules that can determine the future of *peoples*’ societies and economies;
3. **Devolution** - ADAF’s Governance Model can scale with community-based distributed decision-making. Community collaboration is an effective method to community participation and leverage the power of network effects for scale;
4. **Pan-African sustainable development** - ADAF uses tools and metrics for Pan-African development under the AU and SADM to build standards in P2P digital economies. Standards are measured against quantitative objectives like Agenda 2063 and the UNSDGs. Together with *peoples*-driven standards for digital assets, ADAF could form the technological and regulatory backbone for the SADM and DPAs;
5. **Openly accessible** - DPAs supported by standards on the ADAF platform are open and accessible by anyone. This is a stark contrast to other forms of regional trade loc decision making - where standards/rules are often held in secrecy from the public and negotiated internally¹²⁵;
6. **Customizable soft law** - standards are a form of soft law for organizations and governments to borrow from. Soft law is the term applied to measures, such as guidelines, recommendations, declarations and opinions, which – in contrast to regulations, directives, and decisions – are not binding on those to whom they are addressed. There is growing consensus that soft law coupled with self-regulation offer better regulatory tools as compared to hard law. For example, the EU’s approach to technological advances relies on soft law, self-regulation and co-regulation in order to create progressive policy approaches to innovation¹²⁶. Soft law can also be used to anticipate hard law and pave way for legislation once there is conclusive research on the impact of DLTs on the economy and the society;

7. **Ecosystem** - ADAF can act as digital ecosystem. Community organizations can cooperate in the ecosystem to create rules and eventually applications that build platforms and partnerships;
8. **Consensus-driven** - Standards can only be agreed upon. ADAF's governance model allows for liquid feed back and consensus building before a standard is adopted by a majority of the community. The Governance Model also allows for counter proposal presentations that are supported by other community organizations. This builds in the flexibility for *peoples*, companies and states to select and implement the standards and proposals that best suit their context;
9. **Resource center** - the digital asset standards created by organizations under the ADAF, act as a resource centre for governments, organizations and researchers in the digital asset space. Offering a point of reference more than a set of laws means that these standards can be used widely, reduce costs, prevent silos and can be modified based on the needs in any given setting or jurisdiction; and
10. **Replicability** - the ADAF model, planning and structure can be adapted to communities around the world.

Limitations

1. **Member contributions** - ADAF's decentralized and collaborative structure requires organizations to forward proposals. The project is dependent on member's contributions;
2. **Disagreements** - Community disagreements and forks are a common feature of open sourced platforms in the digital asset space. Examples of disagreements can result in 'forks' that can impact the community-driven protocol. Disagreements could similarly impact ADAF's network and protocol, including the standards created through it;
3. **Accessibility** - Pan-African communities are multilingual and separated across jurisdictions, oceans, cultures, tribes, states, sectors and communities. The separation of these communities present a challenge to consensus-driven standards and can lead to further fragmentation in the community;
4. **Incentivization structures** - the Governance Model does not currently include a virtual token or incentivization structure. Without a method to disincentivize behavior and reward good behavior, the platform is vulnerable to network attacks in the form of inappropriate standards and unlimited backing of fraudulent standards on the platform. In order to be sustainable in the long term, ADAF will need to introduce an incentive structure that enables the organizations that contribute the most value to protect against these attack vectors and encourage users to contribute quality standards. ADAF is currently structure to evolve into its own governance protocol.

ADAF for Distributed Pan-African Economies

ADAF's open source approach to actualize DPAs and digital Pan-African economies can encourage community-driven approaches to policy making. For the first time, *peoples* can be involved in creating standards in line with P2P trade and their own cultural, social and historical contexts. The platform empowers *peoples* to create community-driven standards that can drive the continent and its *peoples'* into a digital trade network that stretches across the globe. We have presented that these regional trade networks across common peoples can be referred to as DPAs. The tools for DPAs exist, but need to be

supported by open sourced standards for the digital economies that create it. Fundamental to DPAs, however, will be the freedom of movement for *peoples* across borders.

We propose to the community and readers that one of the most important and first standards that needs to be developed for DPAs and is a Pan-African digital identity built with DLT software protocols.

Use Case: Pan-African Digital Identity and the AU Passport

Pan-African Digital Identity

DLT-based digital identities can ease freedom of movement among *peoples* within the continent and among the diaspora. This identity solution can be built as DLT software protocols that empower *peoples* to own, edit and transfer their identities together with government registries. A Pan-African digital identity solution will need software protocols that are built to capture the data on uniquely diverse *peoples* of African descent: tribal histories, diaspora migrant patterns, genomic research on slave names among the African diaspora, migrant communities, linguistic histories, pre-Scramble for Africa geo-mapping and jurisdiction-specific immigration legislation.

This solution could be created through *peoples*-driven standards on an open sourced platform and enable regulators and community participants to travel across their borders seamlessly. For example, an Afro-Caribbean person could use this identity solution to travel and trade throughout Togo, as easily as an Angolan can in South Africa. In addition to its clear benefits to freedom of movement for DPAs, there is an urgent need for a pan-African digital identity to support and intra-continental trade.

At the AfCFTA signing in Kigali, the Movement Protocol was the least supported text signed by AU member states. For a true intra-continental market, all member states of the AU would need to sign the Movement Protocol and commit to its roadmap to ease border restrictions for Africans. The AfCFTA Agreement was originally signed with 50 states present alongside two other legal instruments: *Kigali Declaration* (“**Declaration**”) and the Movement Protocol. The central AfCFTA text was signed by 40 states, the Declaration by 44 states¹²⁷ and the Movement Protocol by only 30 states. AfCFTA’s economic impact will be limited without cross-continental consensus on border restrictions. More than half of the signatories that did not sign the Movement Protocol were Francophone countries, as of March 2018¹²⁸. There is a need for movement protocol infrastructure that allows countries and *peoples* of diverse backgrounds to customize their own identity solutions without compromising regional movement.

Pan-African built, open and jurisdiction-agnostic standards can be created and widely used by companies and *peoples*. Governments can then use and customize these standards to create jurisdiction-specific identity systems. Those standards are built for compatibility between states and their customized identity management systems. This could eventually facilitate jurisdiction-agnostic travel and *free* movement of *peoples*, goods and services across borders. The political will for the Movement Protocol represents an opportunity to create a pan-African DLT-based digital identity that can be used by *peoples*, customized by

states and built to facilitate intra-continental trade. Open source digital identity standards can support the AfCFTA, DPAs and the Movement Protocol.

Peoples-Driven Digital Identity

There is an urgent need for a digital identity to support intra-continental trade. This is a call to the community to develop those applications in accordance with Pan-African standards and development objectives. A digital identity will require Pan-African and open sourced technological and regulatory standards, data and thought leadership. Identity and culture is a central aspect of any *peoples* of African descent¹²⁹. As such, it should be developed by *peoples* in partnership with regional organizations and governments. The first versions of the platform will lend resources and information that will facilitate the creation of a Pan-African digital identity by the community.

Digital Identities and an African Passport

Digital identities could ease burdensome infrastructure for paper-based and bureaucratic immigration systems, policymakers can transparently identify fraud, empower *peoples* to own their own identities and access global markets. The benefits of a digital identity are central to DPAs and trade across borders. Currently, Africans have to acquire visas to travel to most African countries, inhibiting travel across borders for people, goods and services. The existing regulatory approach also prevents African people from owning their own identity. A self-sovereign digital identity standard could empower *peoples* to own their own data together with their government and facilitate the movement of *peoples* across borders. These digital identity standards can be built alongside the AU's Passport initiatives.

The AU recently launched the African Union Passport (“**AU Passport**”) that aims to launch in 2020. The project does not currently list any plans to build the AU Passport using digital asset or DLTs. However, it will need to build using these technologies for digital identity to be interoperable with other e-governments' identity systems around the world, like Estonia. This represents an opportunity for the ADAF community to create a *peoples*-driven and Pan-African digital identity standard that can complement the goals of the AU Passport in time for its launch in 2020. It is imperative that DLTs be used to not only allow the safekeeping of the holders' private information, but also to increase efficiency in verification of travel documents in a seamless, interoperable manner that captures the distinct complexities of various African *peoples*. It is equally important that the standards for implementation of a digital identity be informed by these *peoples*.

A common passport built with DLTs and digital assets through community-driven standards can provide for digital autonomy, ownership, security and for seamless movement of *peoples* within the continent and among its diaspora. A digital identity that facilitates the seamless movement of an Algerian national to South Africa and of a Barbadian national of Ghanaian ancestry to West African states is long overdue.

Conclusion: United We Stand

DPA's could transform economic prosperity for *peoples* of Africa. This paper presents an argument for the unique opportunities available to the continent and its diaspora. We propose ADAF as a community-driven project that can create the necessary technological and regulatory standards for DPAs to complement public-sector regulations. These standards can encourage P2P networks of trade and commerce in line with Pan-African sustainable development objectives. ADAF's current governance model is a distributed, collaborative ecosystem of organizations and individuals in the Pan-African digital economy that are willing and ready to cooperate and create standards. ADAF's model emulates tenets of open standard principles and is based on values such as fluidity, openness, transparency and linking of organizations. The project is built to support the continent and diaspora's adaptation to impending technological disruptions. ADAF is forged with the opportunity to redefine a Pan-African narrative and finally remove trade barriers between African *peoples* for self-determination, autonomy and communal sharing.

It is our time to realise the dream Pan-African unity espoused by our ancestors forefathers and to create the future our *peoples* deserve.

Endnotes

1. **Marvin H. Coleby** is the CEO of Raise, a Bahamian startup building a company ownership platform to manage compliant digital securities. He serves as an advisor to the Africa Blockchain Alliance and Agent Group, alongside advising partners from MIT, Coindesk, IBM and PwC. Marvin is a bilingual (French and English) technology and securities lawyer and holds a common and civil law degree from McGill University Faculty of Law. He is a published researcher, where he specialized in regional trade financing and international investment arbitration in Africa, Asia and the Caribbean. Marvin is originally from The Bahamas and France.
2. **Felix Macharia** is a senior medical student and holds a degree in medical physiology from the University of Nairobi. He is co-founder and COO of EOSNairobi where he leads product development, research and decentralized protocol research. He is an affiliate scholar with the Institute for Blockchain Studies in New York and has a broad range of interests for healthcare, artificial intelligence and decentralized governance. Felix is originally from Kenya.
3. This paper would be strongly supported, edited and contributed to by editors throughout the continent and diaspora. A great thank you to Alatashe Girvan, Jennifer Githu, Norman Gabula, Keith Mandela, Josiah Mugambi and Melina Mutambaie Katende.
4. Shibaba Yimenu, "Pan-Africanism and African Economic Development," (1975) 6:8, at 44.
5. Integration tools include regional organizations like the African Union and Caribbean Community and includes community-based organizations around the world that encourage Pan-African trade and commerce.
6. Hakim Adi, "Pan-Africanism: An Ideology and a Movement" in Dorothy Hodgson & Judith Byfield, eds, *Global Africa: Into the Twenty First Century* (California: University of California Press, 2007) at 90.
7. Open Source Initiative, "History of the Open Source Initiative (OSI)" (September 2012), online: <<https://opensource.org/history>>.
8. The word 'peoples' is intentionally italicized throughout this paper and is used to denote the diversity and inclusivity among the countless tribes, cultures, states, people, histories and communities that make up Pan-African *peoples* around the world.
9. Heather Stewart, "Tariffs: WTO talks collapse after India and China clash with America over farm products," *The Guardian* (July 30 2008), online: <<https://www.theguardian.com/world/2008/jul/30/wto.india>>.
10. Intra-African trade and industrialization have the potential of creating massive wealth for the continent. The AfCTA can generate between \$751 Million and close to \$18 Billion through intra-continental trade and industrialization. See: Africa Export-Import Bank, "African Trade Report 2018: Boosting Intra-African Trade: Implications of the African Continental Free Trade Area Agreement," *African Export-Import Bank*, online: <<https://afreximbank.com/wp-content/uploads/2018/07/African-Trade-Report-2018.pdf>>
11. Regine Adele Ngono Fouda, "Protectionism and Free Trade: A Country's Glory or Doom?" (2012) 3:5 International Journal of Trade, Economics and Finance at 1, online: <<http://www.ijtef.org/papers/226-CF312.pdf>>.
12. Richard Baldwin, "21st Century Regionalism: Filling the Gap between 21st Century Trade and 20th Century Trade Rules," (2011), 8, World Trade Organization: Economic Research and Statistics Division, Staff Working Paper ERSD, online: <https://www.wto.org/english/res_e/reser_e/ersd201108_e.pdf>.
13. *Ibid.*
14. World Trade Organization, "Members and Observers," (29 July 2016), online: <https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm>.
15. In 1993, regional trade agreements cited less than 10 policy areas. Today, most agreements between regional governments have over 20 policy areas covered, proof of their increasing complexity with technological advances. See at World Bank, "Regional Trade Agreements," (April 5 2018), online: World Bank Website at <<https://www.worldbank.org/en/topic/regional-integration/brief/regional-trade-agreements>>.
16. *Supra* note 12 at 6-8. Baldwin argues that the growth of ICT and technological advancement transformed the global trade agenda, making it easier for people to trade digital assets and communicate. Baldwin calls this growth the "trade-investment-services nexus", where 21st century trade is characterized by regional groupings for simpler negotiations and trade relationships.
17. *Ibid.*
18. World Trade Organization, "Understanding the WTO," (2015), online: World Trade Organization Website at: <https://www.wto.org/english/thewto_e/whatis_e/tif_e/understanding_e.pdf>.
19. *Marrakesh Agreement Establishing the World Trade Organization*, 15 April 1994, No. 3178 at preamble, (entered into force 1 January 1995).
20. *Ibid* at III(2), IX(1).
21. World Trade Organization, "Announcement of Doha Round" online: World Trade Organization Website at <https://www.wto.org/english/news_e/pres01_e/pr240_e.htm>.
22. Stuart Harbinson, "The Doha Round: 'Death-Defying Agenda' or 'Don't Do It Again'?" (2009), 10, European Center for International Political Economy, Working Paper at 1-4.
23. World Trade Organization, "Doha WTO Ministerial 2001: Ministerial Declaration WT/MIN(01)/DEC/1," (14 November 2001) 4.
24. *Supra* note 9.
25. World Trade Organization, "Eleventh WTO Ministerial Conference," *World Trade Organization Website*, online: <https://www.wto.org/english/thewto_e/minist_e/mc11_e/mc11_e.htm>.
26. World Trade Organization, "Regional Trade Agreements Information System," *World Trade Organization Website*, online: <<https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx>>.
27. Tomas Hirst, "What are Mega-Regional Trade Agreements?" *World Economic Forum Website*, (July 9 2014), online: <<https://www.weforum.org/agenda/2014/07/trade-what-are-megaregionals/>>.
28. *Supra* note 26.
29. Adam Smith, *An Enquiry into the Causes of The Wealth of Nations* (2005) 399 Pennsylvania State University, online: <<https://cet.pixel-online.org/files/etranslation/original/The%20Wealth%20of%20Nations.pdf>>.

30. The decentralization of the WTO's role as a multilateral trade organization is also presenting difficulties for smaller states that are not part of these mega-regional trade deals. Under the WTO model, each Member State was able to cast one vote. Without this tool, smaller states with smaller economies are at risk of being left out of future global political economies.
31. World Economic Forum, "Mega-Regional Trade Agreements - Game-Changers or Costly Distractions for the World Trading System?" (2014), *World Economic Forum Website*, online: http://www3.weforum.org/docs/GAC/2014/WEF_GAC_TradeFDI_MegaRegionalTradeAgreements_Report_2014.pdf.
32. *Supra* note 27.
33. Ioana Gutu, "The TTP and TTIP Agreements, The International Negotiation Process," (2016) 8:1 CES Working Paper at 81-91.
34. John Edwards, "What's Next after the US withdrawal from the TPP?" *Al Jazeera* (26 January 2017), online: <https://www.aljazeera.com/indepth/opinion/2017/01/withdrawal-tpp-170126092759229.html>.
35. *Trans-Pacific Partnership Agreement*, 4 February 2016 at Annex 1-A (not yet in force); World Trade Institute, "TTIP and the EU Member States" (January 2006), online: World Trade Institute Website at https://www.wti.org/media/filer_public/03/b8/03b803d4-e200-4841-9c58-f6612f4a7316/ttip_report_def.pdf.
36. BRICS States, *Joint Statistical Publication*, (2017) at 25, online: http://www.gks.ru/free_doc/doc_2017/JSP-2017.pdf.
37. International Monetary Fund, "Report for Selected Countries and Subjects - BRICS," (April 2013) at 1 online, at: <https://www.imf.org/external/pubs/ft/weo/2013/01/weodata/weorept.aspx?pr.x=91&pr.v=5&sy=2011&ey=2018&scsm=1&ssd=1&sort=country&ds=.&bs=1&c=223%2C924%2C922%2C199%2C534&s=NGDPD%2CNGDPDPC%2CPPPGDP%2CPPPPC&grp=0&a=>>.
38. Jakkie Cilliers, Barry Hughes and Jonathan Moyer, "Africa Futures 2050: The Next 40 Years" (2011) 175 Monograph at 1-14, online: <https://www.files.ethz.ch/isn/126598/Mono175.pdf>.
39. Terry McKinley, "BRICS to Play a Leading Role in Driving Future Global Economic Growth," *Institute for New Economic Thinking* (April 20, 2018), online: <https://www.ineteconomics.org/perspectives/blog/brics-to-play-a-leading-role-in-driving-future-global-economic-growth>.
40. *Agreement on the New Development Bank*, 2015, at preamble (entered into force 15 July 2015), online: <https://www.ndb.int/wp-content/themes/ndb/pdf/Agreement-on-the-New-Development-Bank.pdf>.
41. *Asian Infrastructure Investment Bank Articles of Agreement* at preamble, online: https://www.aiib.org/en/about-aiib/basic-documents/download/articles-of-agreement/basic_document_english-bank_articles_of_agreement.pdf.
42. African Trade Policy Center, "African Continental Free Trade Area: African Trade Policy Center and United Nations Economic Commission for Africa Questions and Answers," online at 1, online: https://au.int/sites/default/files/documents/33984-doc-qa_cfta_en_rev15march.pdf.
43. African Union, "Press Release: AU Member Countries create history by signing the AfCFTA Agreement in Kigali," *African Union Press Releases and Website* (March 21 2018), online: <https://au.int/en/pressreleases/20180321/au-member-countries-create-history-massively-signing-afcfta-agreement-kigali>; African Union, "Indication of Legal Instruments to be Signed at the 10th Extraordinary Session of the Assembly on the Launch of the AfCFTA", African Union Documents, online: <https://au.int/sites/default/files/pressreleases/34033-pr-indication20of20signing20authority20-20updated20final20final20docx.pdf>.
44. *Supra* note 42 at 1-2.
45. *Agreement Establishing the African Continental Free Trade Area*, 21 March 2018, at Article 3(a), (c), (d). The Agreement's preamble states that the African Union member states aim to strengthen economic integration with the tools of the *Constitutive Act of the African Union of 2000*, which states that its objective is to create prosperity for the "peoples of Africa" and member states.
46. TRALAC, "South Africa Signs African Continental Free Trade Area agreement" *TRALAC and South Africa News* (3 July 2018), online: <https://www.tralac.org/news/article/13216-sa-signs-african-continental-free-trade-area-agreement.html>.
47. Gloria Iribagiza, "Interview with Dr. Hamadou Toure: Smart Africa and the Digital Economy of the Continent" (6th June 2018) online: Smart Africa Website at <http://smartafrica.org/press-room/news/article/interview-dr-hamadoun-toure-executive-director-of-smart-africa>.
48. European Commission, "What is the Single Digital Market About?" Eurostat Website, online: at <https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-4.html>.
49. European Commission Press Release, "European Countries join Blockchain Partnership," European Commission Website (April 10, 2018) online:
50. *Ibid.*
51. *2018 Declaration of European Partnership on Blockchain* at 1, paragraph 3, online: http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=50954.
52. *Constitutive Act of the African Union*, 11 July 2000, at preamble (entered into force 1 July 2001).
53. Tajudeen Abdul-Raheem, "Politics, Economy and Social Change in the Twenty-First Century: First Edition" (USA: New York University Press, 2003) at 5. Dr. Abdul-Raheem presents a history of the Pan-African movement from its birth at the 1st Pan-African Congress by Caribbean and American diaspora leaders, to the African Union's creation. He presents a causal link between the diaspora-led Pan-African movement, independence movements and continental free trade areas.
54. W.E. Burghardt Dubois, "The Pan-African Movement," in George Padamore, eds, *Colonial and Coloured Unity: A History of the Pan-African Congress*, 2nd ed (London: Hammersmith Bookshop Limited, 1963) at 16, online: <https://www.prisonership.info/archive/etext/countries/panafrican/pac1963.pdf>.
55. Sonia Plaza and Dilip Ratha, "Harnessing Diaspora Resources for Africa," in Sonia Plaza and Dilip Ratha, eds, *Diaspora for Development in Africa*, (Washington: World Bank Press, 2011) at 7-22, online: http://siteresources.worldbank.org/EXTDECPROSPPECTS/Resources/476882-1157133580628/Dfd_FullReport.pdf.
56. Hakim Hadi and Marika Sherwood, *Pan African History, Political figures from Africa and the Diaspora Since 1787*, (London/New York: Routledge Press, 2003) at vii, online: https://www.sahistory.org.za/sites/default/files/file%20uploads%20hakim_adi_pan-african_history_political_figuresbook4you.org_pdf.
57. Kingsley Makhubela, "Africa's Greatest Opportunity: Trading with Itself," *World Economic Forum* (16 January 2018), online: <https://www.weforum.org/agenda/2018/01/why-africas-best-trading-partner-is-itself/>.

58. Shakir Akorede, "How a Single Market Economy would Transform Africa's Economy," *World Economic Forum* (28 February 2018), online: <<https://www.weforum.org/agenda/2018/02/how-a-single-market-will-transform-africa-s-economy/>>.
59. Marriana Sow, "Africa's Intra and Extra-Regional Trade," *Brookings Institute* (9 March 2018) at 2, online: <<https://www.brookings.edu/blog/africa-in-focus/2018/03/29/figures-of-the-week-africas-intra-and-extra-regional-trade/>>.
60. *Supra* note 42.
61. *Protocol to the Treaty Establishing the African Economic Community relating to Free Movement of Persons, Right of Residence and Right of Establishment*, May 26 2018, at preamble, (adopted 29 January 2018).
62. *Supra* note 42 at 2-4.
63. *Ibid* at 5.
64. Bela Balassa, *The Theory of Economic Integration: An Introduction, 2nd Edition* (New York: Routledge, 2011) at 173- 185, online: <[http://ieie.itam.mx/Alumnos2008/Theory%20of%20Economic%20Integration%20\(Belassa\).pdf](http://ieie.itam.mx/Alumnos2008/Theory%20of%20Economic%20Integration%20(Belassa).pdf)>.
65. *Supra* note 38; The authors of this article present both historical and forecasting data reflecting the continent's growth; trade volumes have increased massively, for example BRIC-Africa trade shot from \$22.3 Billion in 2000 to \$166 Billion in 2008 and is projected to be in the trillions by 2030; the GDP of African economies is projected at more than \$13 Trillion by 2050; the workforce in Africa will exceed that of China before 2030 and that of India before 2035 because of the growing population of the youth; and the sociopolitical scene is expected to greatly improve, with an increase in general democracy levels across the continent.
66. Normaz Wana Ismail and Jamilah Mohd Mahyideen, "The Impact of Infrastructure on Trade and Economic Growth on Selected Economies in Asia," (2015) 553 *Asian Development Bank Institute Working Paper Series*, online: <<https://www.adb.org/sites/default/files/publication/177093/adb-wp553.pdf>>.
67. Cobus van Staden, "Can China Realize Africa's dream of an East-West Transport link?" (2018) 18:6 *China Brief Volume of the Jamestown Foundation*, online: <<https://jamestown.org/program/can-china-realize-africas-dream-of-an-east-west-transport-link/>>.
68. African Union and New Partnership for Africa's Development, *Move Africa Report*, at page 2, (NEPAD, 2018), online: <<http://www.nepad.org/download/file/fid/3345%20>>.
69. African Union, *Single African Air Transport Market*, at page 3, online: African Union Website at <https://au.int/sites/default/files/newsevents/workingdocuments/33100-wd-6a-brochure_on_single_african_air_transport_market_english.pdf>.
70. *Yamoussoukro Declaration*, 13 November 1999, at preamble, ECA/RCID/CM.CIVAV/99/RPT, online: <http://afcac.org/en/images/Documentation/yd_eng.pdf>.
71. *Supra* note 69 at 8.
72. *Ibid*.
73. Julia Breuer, "Two Belts, One Road? The role of Africa in China's Belt and Road Initiative," (2017) *Block Wechsel*, at 2- 4, online: <https://www.asienhaus.de/uploads/t_x_news/Blickwechsel_OBOR-Afrika_01.pdf>.
74. *Supra* note 67.
75. *Supra* note 73.
76. *Supra* note 67.
77. This paper does not intend to present BRI's presence in Africa either positively or negatively, no bias is intended and the BRI is presented as an opportunity for growth through overland infrastructure.
78. *Supra* note 38, at 7-9.
79. United Nations, "United Nations Assembly adopts resolution proclaiming Third Industrial Development Decade for Africa" (2 August 2016), United Nations Website, online: at <<https://www.un.org/sustainabledevelopment/blog/2016/08/un-assembly-adopts-resolution-proclaiming-third-industrial-development-decade-for-africa>>.
80. *Supra* note 38 at 59.
81. GMSA, "State of the Industry Report on Mobile Money," *GMSA* (2017) at 8-10, online: <https://www.gmsa.com/mobilefordevelopment/wp-content/uploads/2018/05/GMSA_2017_State_of_the_Industry_Report_on_Mobile_Money_Full_Report.pdf>.
82. *Ibid*.
83. Safaricom Kenya Limited, "Safaricom Annual Report and Financials," *Safaricom* (2017) at 9-11, online: <https://www.safaricom.co.ke/images/Downloads/Resources_Downloads/Safaricom_2017_Annual_Report.pdf>.
84. Julie Zollmann and Paul Gubbins, "Access to Financial Services has Transformed Kenya, but there is still work to do," *World Economic Forum*, (30 January 2017) online: <<https://www.weforum.org/agenda/2017/01/access-to-financial-services-kenya-much-work-to-do/>>.
85. GSMA, "The Mobile Economy; Sub-saharan Africa Report," *GMSA* (2017) at 5-6, online: <<http://www.gsmaintelligence.com/research/?file=7bf3592e6d750144e58d9dcfac6adfab&download>>.
86. Mobile money has had a demonstrable impact on the continent and has become a gateway to the digital economy for the developing world, even contributing to 13 of the 17 Sustainable Development Goals. See *supra* note 81.
87. Michael J. Casey and Paul Vigna, *The Truth Machine: The Blockchain and the Future of Everything*, (St. Martin's Press, 2018) at 71-72.
88. Daniel Kraft, "Difficulty Control for Blockchain-Based Consensus Systems" (Paper delivered at the University of Graz on 18 March 2015), online: <<https://www.wusecoins.com/assets/pdf/library/University%20of%20Graz%20Blockchain%20Difficulty%20Control.pdf>>.
89. GMSA, "The Sharing Economy in Emerging Markets" *GMSA* at 1, online: <https://www.gmsa.com/mobilefordevelopment/wp-content/uploads/2016/05/GMSA_Ecosystem_Accelerat>;
90. *Supra* note 81 at 9.
91. *Supra* note 89 at 6.
92. *Ibid* at 29.
93. Communications Authority of Kenya, *Fourth Quarter Sector Statistics Report for The Financial Year 2016/2017*, "Mobile Money Transfer Services," at page 13, online: <<https://ca.go.ke/wp-content/uploads/2018/02/Sector-Statistics-Report-Q4-2016-17.pdf>>.
94. *Supra* note 85 at 31.

95. African Development Bank Group, “Jobs for Youth in Africa: Catalyzing Youth Opportunity Across Africa,” *African Development Bank Group* (March 2016) at 1-2, online: <https://www.afdb.org/fileadmin/uploads/afdb/Images/high_5s/Job_youth_Africa_Job_youth_Africa.pdf>.
96. *Supra* note 87, at 122. Casey and Vigna present that in an IoT economy in the Fourth Industrial Revolution, distributed ledgers will serve as a “fundamental backbone of the network computational capacity” of the 4IR.
97. Klaus Schwab, *The Fourth Industrial Revolution*, (World Economic Forum, 2016) at 8-9, online: <<https://luminariaz.files.wordpress.com/2017/11/the-fourth-industrial-revolution-2016-21.pdf>>. Schwab is Founder and Executive Chairman of the World Economic Forum. In his book, he details the dramatic shifts of the 4IR in human politics, economics and society.
98. *Ibid* at 22. In this section Schwab discusses the shift in moving from the physical world to a digital one, both due to IoT and Blockchain (last paragraph).
99. *Supra* note 87.
100. Tasew Gashaw, “Colonial Borders in Africa: Improper Design and its Impact on African Borderland Communities,” *Wilson Center* (17 November 2017), online: <<https://africaupclose.wilsoncenter.org/colonial-borders-in-africa-improper-design-and-its-impact-on-african-borderland-communities/>>.
101. Reason TV, “Interview with Hernando de Soto: de Soto knows how to make the 3rd World Richer than the First,” (July 13, 2018) online: at <<https://reason.com/reasonTV/2018/07/13/hernando-de-soto-blockchain-property>>; see Casey *supra* note 87 at 115.
102. David Shrier, Weige Wu, Alex Pentland, “Blockchain & Infrastructure (Identity, Data Security)” (2016) 3, Massachusetts Institute of Technology: MIT Connection Service 3: at 7, online: <https://www.getsmarter.com/blog/wp-content/uploads/2017/07/mit_blockchain_and_infrastructure_report.pdf>.
103. *Supra* note 87 at 123.
104. *Ibid* at 59.
105. *Supra* note 55 at 13.
106. World Bank Group and Knomad, *Migration and Remittances: Recent Developments and Outlook*, (2018), online: <<https://www.knomad.org/sites/default/files/2018-04/Migration%20and%20Development%20Brief%202029.pdf>>.
107. *Supra* note 55 at 3.
108. Manuel Orozco, “Remittances to Latin America and the Caribbean in 2017,” *The Dialogue* (2017) at 1, online: <<https://www.thedialogue.org/wp-content/uploads/2018/01/Remittances-2017-1.pdf>>.
109. *Supra* note 55 at 10 and 21.
110. Dan Kopf, “Remittances to Africa cost are too much - more competition would change that” *Quartz Africa* (May 9 2018), online: <<https://qz.com/africa/1272445/remittances-sending-cash-to-africa-is-most-expensive-says-world-bank/>>
111. Ed Wu, “International Remittances and Blockchain Technology” *Stanford University Public Policy Programs*. 2018 Online: *Stanford University Public Policy Program* <<https://publicpolicy.stanford.edu/publications/international-remittances-and-blockchain-technology>>
112. Bitpesa, Frontier Market for Payments, online: <<https://www.bitpesa.co/solutions/psi/>>.
113. For example, a recent transaction of USD \$194m worth of Bitcoin was transacted for USD \$0.10.
114. Prof. Makau Mutua, “The Problematic Rebirth of Liberalism in Africa and why the Rule of Law must be reconsidered to achieve Sustainable Development,” (2016), 23:3, *Africa and the Rule of Law*, online: <<https://digitalcommons.law.buffalo.edu/articles/640/>>
115. EM Compass, “Blockchain Governance and Regulation as an enabler for market creation in emerging : *World Bank Series No 57* <https://www.ifc.org/wps/wcm/connect/aca347b3-d57d-457c-a34d-04cab3da3417/20180921_EMCompass-Note-57-Blockchain-Governance_v1.pdf?MOD=AJPERES>
116. Lousi C. Greenwood, “Digital Assets and Blockchain Technology, Assessing the Magnitude of Disruption in Securities and Capital Market Regulation,” Greenwood Lecture Series (2018), online: <<https://law.case.edu/Lectures-Events/EventId/371/e/digital-assets-and-blockchain-technology-assessing-the-magnitude-of-disruption-in-securities-and-capital-market-regulation-7-nov-2018>>.
117. *Supra* note 114 at 5.
118. Mutua presents 7 principles of a new conception of the rule of law in line with Africa’s sustainable development. He argues that in order for sustainable development on the continent to occur, there is a need to reform existing legal regimes in line with legal systems and principles that better suit local cultural, economic, social and political contexts.
119. Caroline Ncube, “Decolonising Intellectual Property Law in Pursuit of Africa’s Development,” (2016), 8:1, *World Intellectual Property Organization Journal* <https://drive.google.com/file/d/0B0_9H_Dh21O1Vua0RodktHTHdqBqG8/view> at 38.
120. The Harvard Law Review Forum allows for sharing of legal content digitally in an open source manner; see <<https://harvardlawreview.org/topics/forum/>>.
121. Jan-Felix Schrape, “Open Source Projects as Incubators of Innovation: from Niche phenomenon to Integral part of Software Industry,” (2017), 3:1, *Institute for Social Sciences Organizational Sociology and Innovation Studies*, online: <http://www.uni-stuttgart.de/soz/oi/publikationen/soi_2017_3_Schrape_Open.Source.Projects.Incubators.Innovation.pdf>
122. *Ibid*.
123. *Supra* note 119. In this section of the paper, Professor Ncube proposes content for a pan-African intellectual property course as an open educational resources that can be customized to suit African contexts. This could calibrate approaches to IP issues and harmonize rules across the continent.
124. Richard Murch, “Open Standards: Principles and Organizations”, (2004), *Inform IT*, online: <<http://www.informit.com/articles/article.aspx?p=352984&seqNum=2>>.
125. Arther Nselen, “Leaked TTIP documents cast doubt on EU-US Trade Deal,” *The Guardian*, (May 1, 2016), online: <<https://www.theguardian.com/business/2016/may/01/leaked-ttip-documents-cast-doubt-on-eu-us-trade-deal>>.
126. Examples of innovations where the EU has opted for soft law include include nanosciences and GMOs.

127. African Union “Indication of Legal Instruments to be Signed at the 10th Extraordinary Session of the Assembly on the Launch of The AFCTA,” *African Union* (2018), online:< <https://au.int/sites/default/files/pressreleases/34033-pr-indication20of20signing20authority20-20updated20final20final20docx.pdf>>.
128. Cote d’Ivoire, Seychelles, Algeria, Morocco, Swaziland, Tanzania, Saharawi Republic, Benin, Cameroon, Cape Verde, Libya, Madagascar, Mauritius, Zambia, Egypt, Botswana, Ethiopia, Namibia and Tunisia did not sign the Movement of Protocol in Kigali. See *ibid* at 1-4.
129. Amilcar Cabral, *Unity and Struggle: Speeches and Writings of Amilcar Cabral*, (London Monthly Press, 1979) at 142.