THE IMPACT OF A CULTURAL INFORMATION SYSTEM (CIS) ON THE TRANSFORMATION OF AFRICAN DEVELOPING COUNTRIES INTO SUSTAINABLE DIGITAL ECONOMIES: CASE OF CAMEROON.

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Abstract

Information and communication technologies (ICT) are effective tools for improving sustainable development in African countries. This can be achieved by increasing access to information, facilitating communication, and promoting digital entrepreneurship. Cameroon's cyberspace as it stands, is not equipped enough to arm its population with information relevant to the blossoming of a digital economy.

This conceptual paper hereby presented, puts forward that the Cultural Information System (CIS) can be a valuable tool to accelerate the transformation of developing African nations into fully-fledged digital economies. To get the expected results, the CIS is focused on increasing access to information and socio-cultural resources, fostering economic activity and hence growth, and empowering individuals to participate in the global economy in contexts that address their daily realities. This paper seeks to add to the evolving literary discourse on the intersection of ICTs, its impact on the socio-cultural state of countries, digital patriotism, and the sustainable development of African countries.

Keywords: Cultural information system (CIS); Digital economy; sustainable development; Information and communication technology (ICT).

Introduction

The digital economy has the potential to generate and evolve numerous opportunities for socio-economic growth and development in African countries. The integration of information and communication technology ICTs in various sectors of the economy impacts the way businesses, individuals and governments supply services (Korovkin, 2019). However, a considerable digital divide is still obvious, particularly in developing countries where access to relevant information and the utilization of ICT is still a challenge (Mutula, 2008). Cameroon, a central African country, falls into this group. Cameroon's current cyberspace provides inadequate resources to support the decision-making needs of its population. (Williams & Edge, 1996; Ngufor 2021).

Given this poor performance of the cyberspace, there is a need for innovative solutions that have the potential to enhance access to information, socio-cultural resources, promotion of economic growth and social cohesion. This solution should enable increased participation of a country's population in the global economy while merging the country's local realities and digital innovation initiatives (Raymond, 1999). The Cultural Information System (CIS) is one such solution that holds the potential to spearhead sustainable digital growth in developing African countries.

This research work discusses the potential impact a CIS can have on the transformation of African developing countries into sustainable digital economies with Cameroon as the case study. The paper proposes a new model for social networking in the African context based on the author's observations and experiences. The CIS concept was first introduced by Ngufor (2021) in the book *"CAMEROONIAN DIGITALIZATION: Remodelling and Controlling Our Cyberspace by Embracing the CULTURAL INFORMATION SYSTEM"* where he predicted the overwhelming

advancement of Web 3.0 and the rise of new web applications that do not align with the broader socio-economic context of developing countries such as Cameroon. Effoduh (2016) stresses the importance of considering the potential consequences of emerging technologies on society and the economy while valuing regional and domestic structures and prioritizing human welfare and dignity. Similar concepts to the Cultural information system such as Zalo (Vietnam), WeChat (China), and Kakaotalk (South Korea/Japan) have already been established in Asia and some parts of Europe (Tang & Lee, 2016). However, no specialized system has been developed for the single use of an African developing country.

To that end, this paper breaks down the CIS framework and clearly outlines the potential impact of the Cultural Information System (CIS) on the transformation of African developing countries into sustainable digital economies We adopt a very broad definition of the CIS, without implying a particular consensual 'orthodoxy', clear boundaries, or claims of ownership to the field. As we hope to show, much of the strength in this area lies in the very diversity of work which it encompasses.

According to Ngufor (2021), the Cultural Information System (CIS) is a contextualized social networking platform designed to cater to the specific needs of a single developing country. Its development is based on the country's unique use cases which allows it to build capacity and grow. The CIS aims to aid a country like Cameroon, transition from a traditional economy to a digital economy using a careful combination of Web 1.0,2.0,3.0 technologies in one context-driven platform. This transition places the recipient country in a connected economy state and allows the integration of complex technologies such as artificial intelligence with legacy technology such as USSD technology. The goal here being to provide digital services that will lead to increased information, connection and consultation between businesses, individuals, cities and governments. This enhanced system leads to more digitally-efficient economic activity.

Tackling the CIS framework from a critical realist perspective allows us to view the CIS not as a simple neutral technological platform, but rather a product of complex socio-economic and politico-cultural activities through which it evolves through usage in a complex network effect. This context includes the availability of technological infrastructure, the regulatory environment, the cultural values and practices of the users, and the economic incentives that drive the development and adoption of the system (Tyfield, 2012). In the same light, the CIS also presents high chances of shaping the future of these African communities as it provides new patterns of communication, collaboration, economic growth and social cohesion. This case applies to a country like Cameroon in which barriers such as the digital divide exist.

The CIS is unique in its ability to combine various powerful concepts from various web eras to innovate, evolve and develop developing economies (Aghaei et al. 2012). Web 1.0 provides a base allowing the availability of information. The CIS takes advantage of the static nature of Web 1.0 which ensures reliable and stable structure for storing and retrieving information. Web 2.0 will instead focus on user-generated content and the multiplication of social interactions. The participatory nature of Web 2.0, is vital to ensuring that the individuals within the community are active contributors to the digital economy allowing increasing benefits for businesses and governments. Web 3.0 on its own will focus on the decentralization of CIS artifacts such that data ownership is controlled by the system users. This will enable citizens retain full ownership rights over their data, ensuring privacy and security.

The CIS framework's focus on the social shaping of technology and the inherent "choices" in innovation is particularly relevant to understanding how to develop an information economy that is responsive to the needs and interests of African societies Webster (2014). Central to the CIS

framework is the concept that there are inherent "choices" in both the design of individual artifacts and systems, and in the direction or trajectory of innovation programs. Innovation is a "garden of forking paths," and different routes are available, potentially leading to different technological outcomes with differing implications for society and particular social groups. The CIS framework is characterized by "Triad of Digital Empowerment.": Access, technology and Community engagement. They form the 3 pillars of the CIS framework and in unison, direct a cohesive strategy for creating inclusive and sustainable use cases for the evolvement of the digital economies in developing countries.

- *Access (availability & Inclusion)* - refers to the availability of the necessary resources and infrastructure required to connect people to the CIS. The CIS focuses on connecting people, making available the necessary resources to evolve in the society. Particularly those who have been marginalized and excluded due to the digital divide or other factors. The CIS ensures that they are not left behind digitally and uses digital technology to provide them specialized services.
- *Technology (Efficiency & delivery)* - refers to the efficiency of delivering the necessary technology for to people who need it, be it social networking, contextualized online services or e-government services. Efficiency in technology delivery ensures that the CIS can be accessed by people in a timely and cost-effective manner.
- *Community engagement (culture & cohesion)* – This pillar emphasizes the relevance of social cohesion and cultural identity for every community using the CIS. It emphasizes the focus of the CIS on digital technology like many others, but with the new orientation of social interaction, cultural exchange, and identity formation.

The CIS framework addresses the needs of 3 distinct groups of users: individuals, businesses and government agencies. The 3 groups of CIS users both within the national territory and in the diaspora, play important roles in the effective functioning of the platform. Granovetter (1973) argues that weak ties in social networks are just as important as strong ties for facilitating information flow and social mobility. This solidifies the idea to include the diaspora in the development of the CIS framework as the diaspora has strong and weak ties with local stakeholders in developing countries.

Individuals benefit from online services which are provided by government and businesses via the CIS. User-generated content from users such as reviews, ratings and comments increase the value of the CIS as an engaged online community. Businesses promote their products and services and benefit from analytics to improve their offerings. Governments will include the CIS in their e-government strategies as they seek to provide quality online services to the population. The CIS also enables the government to gain insight into citizen needs and preferences thereby enabling the development of effective policy and governance strategies. This novel outcome will increase civic engagement and may lead to increased patriotic feelings in the digital realm. Effoduh (2016) believes that governments, public institutions, the private sector, and citizens must work together to close the gap between developed and developing countries.

The birth of the internet coincided with the peak of the industrial revolution and has since evolved rapidly giving highly industrialized nations the lead in the digital economy (Kobilov, & Rikhsimboev, 2021). Developing economies have already achieved the sort of structure the CIS is providing as their economies have grown alongside the development of the digital age. The rapid development of western economies can be attributed to higher levels of research in R&D, greater access to resources and capital, more advanced in technological infrastructure, better educated

population and more favorable regulatory environments and government policies supporting innovation and technological development (Mulaydinov, 2021).

The CIS framework emphasizes that capacity must be built with available resources including human, capital and material rather than mirroring societies which do not align with the current context. As of January 25, 2021, the internet penetration rate in Cameroon stood at 34%. In contrast, the Internet penetration in the USA in 1999 was 35.8%. In terms of internet adoption and usage, we are 22+ years behind the USA. It is then logical to put forward that a country like Cameroon cannot take the same approach with the USA who spearheads most of the advances in technology. A gap is evident when considering low internet penetration rate in Cameroon: 45.6% (12.89 million internet users) compared to the USA's 91.8% (311.3 million internet users) (DataReportal, 2023).

African developing countries like Cameroon should focus on building their digital capacities rather than blindly following western digital trends rapidly propagated through mainstream media. The digital capacities built over time by developed countries enable them to absorb complex digital development in ways most developing countries cannot. Anderson (2008) discusses how the digital era has created niche markets that can be profitable despite having small audiences. The CIS is better conceptualized when we consider countries as niche markets with individual cyberspaces existing independently in the global market. While some countries may have smaller populations and low rates of internet penetration, their independent nature confers them a unique context which differentiates their needs and the natures of goods and services which are exchanged.

Web 3.0 digital trends such as the metaverse proposed by Meta (previously Facebook) which allows the user get fully immersed in the digital space using augmented reality and virtual reality will add almost no value to the current Cameroonian cyberspace if we cannot first focus on perpetrating best practices of web 1.0 such as Simplicity, static content which is easy to index on search engines, emphasis on information, standardization, text-based and optimization for slow internet connections And those of web 2.0 such as content, collaboration and interaction for the Cameroonian context. While developed countries are pushing R&D efforts towards web 3.0, developing countries must ensure they have a solid base and provide greater utility of digital technologies for their population.

The CIS as presented in this paper shows great potential to improve issues of digital and socio-cultural identity in Africa. By providing a platform that preserves and promotes African cultural heritage through the use of ICT, the CIS can contribute to the creation of a high sense of digital and socio-cultural identity for African countries. The CIS can facilitate knowledge sharing and management by providing an environment for individuals, businesses, and governments to exchange information and collaborate. This has the potential to bridge the gap in knowledge and technology within African countries and the rest of the world.

Digital technology has grown exponentially in the last decade and does not look to slow down in the coming years. This change comes with the potential of unprecedented progress and change for African economies. However, it is important to consider how data and its impact on decision-making will contribute to this change. With the huge surge of big data, the challenge will be to distinguish valuable information from noise in an era where technology is advancing at an unprecedented rate (Kurzweil, 2004). The rise of digital technologies has transformed the economy into one based on attention rather than goods and services. Attention has evolved to be the most valuable commodity in the digital age, and people have a limited amount of attention to give at any given time. This creates a new form of competition that is different from traditional economic competition. Goldhaber, M. H. (1997). A well-implemented CIS has the potential to exponentially

accelerate the growth and adoption of internet in developing countries as the CIS makes the internet more valuable. By leveraging the power of the CIS, developing countries can leapfrog traditional technology adoption cycles and accelerate their digital transformation.

Methods

Data Collection and analysis: This conceptual paper was developed using qualitative case study and data was collected using document analysis. Internet statistics were collected from the data reportal and statista websites and The UN e-government survey 2020 and 2022 provided important details concerning e-government development. Lastly, the 2035 Cameroon emergence document published by the Cameroonian government served as a basis to link the Cameroonian economy to the CIS concept.

Case study approach: The researchers approached the Cameroonian case study by aligning the 2035 emergence plan produced by the Cameroonian government to the CIS framework. Cameroon is a suitable case study due to its low internet penetration and yet increasing rate year on year. The number of internet users and also social media users increases every year. Including a CIS in the Cameroonian cyberspace, will increase the relevance of internet beyond traditional social media which is mostly used for entertainment and focus it on cultural and socio-economic use cases.

Theoretical Framework

At a theoretical level, the Cultural Information System (CIS) framework provides a comprehensive and integrated approach to understanding the role of technology in shaping society, particularly in developing countries like Cameroon.

The theory of Cultural Information Systems (CIS) proposes a contextualized socio-technical framework that facilitates the design of an online platform that is tailored to the unique cultural, economic, political, and social realities of a given developing economy. By constraining the scope of the system to a specific cultural setting, the CIS theory asserts that the platform allows the society to organize itself effectively, generating stable network externalities that enhance communication and enable equitable access to online services for telecommunication users within the society, including individuals, businesses, and government agencies, as well as those in the diaspora.

This improves the overall effectiveness and sustainability of the platform as it addresses the issue of technological determinism, bridges the digital divide and promotes the growth of the society's digital ambitions thereby contributing to its economic development.

- *Network externalities* refer to the positive effects that the use of a particular product or service has on its users, which increases as more people use it. A stable network externality is generated when members of the society interact effectively on the platform.
- *The telecommunication users* referred to in the CIS theory include anyone who uses communication technology in the society, such as mobile phone users, internet users, and other telecommunication devices. The focus is on individuals, businesses and government agencies.

Key theories that underpin the CIS theoretical framework are;
- *Actor-Network Theory*: Technology is not just a tool but an actor in its own right that influences and shapes social relations. The CIS framework recognizes the role of technology as a social actor and seeks to create a network of actors to achieve its objectives.
- *Technology Acceptance Model*: TAM has a significant impact on the CIS framework as it provides insights into how users will interact with and adopt the various technologies and services offered by the CIS. By understanding the factors that influence user adoption, CIS

can design its offerings to be more user-friendly and useful, thereby increasing adoption rates and contributing to the transformation of African developing countries into sustainable digital economies

- Finally, the *diffusion of innovation theory* is also relevant to the CIS framework. This theory explains how new ideas, products, and technologies are adopted and spread throughout a society. The CIS framework leverages this theory to explain how the platform can be effectively diffused and adopted by users, businesses, and government agencies.

The CIS framework is informed by multiple theories. These theories provide a basis for understanding the complex socio-technical processes involved in the development and implementation of CIS and how it can contribute to the socio-economic development of African societies.

The following assumptions are made when analyzing the CIS theory;

- Developing countries have unique cultural, economic, political, and social realities that require a customized approach to the design of online platforms and services.
- The digital divide in developing countries can limit access to online services and communication, particularly for marginalized groups such as rural residents and women.
- Telecommunication users in developing countries have a need for online services that reflect their cultural and social contexts, such as language preferences, cultural practices, and social norms.
- Developing countries have a growing diaspora community that could benefit from access to online services and communication channels that reflect their home country's cultural context.
- Successful implementation of the CIS theory requires collaboration and coordination between government agencies, businesses, and individuals in the targeted society.
- The CIS theory assumes that the platform design will adhere to privacy and security standards to protect the personal data of users.
- The CIS theory assumes that the platform design will be sustainable and have a positive impact on the targeted society's economic and social development
- It's important to note that some of these assumptions may not hold true in all developing countries, as each society has its own unique circumstances and challenges. However, careful consideration must be given to privacy and security concerns, as well as ensuring that the platform is accessible and user-friendly for all members of the community.

Conceptual framework: The conceptual framework below integrates the theoretical perspectives discussed above. It presents the CIS as a system that combines blended technologies and e-government concepts which is relevant to individuals, businesses and the government.

Limitations: This methodological approach to provide a conceptual view for the cultural information system is plagued by limited data sources and will require technical development and testing of the concept. The generalizability of these findings beyond Cameroon is limited as the context of other developing countries has to be studied in detail.
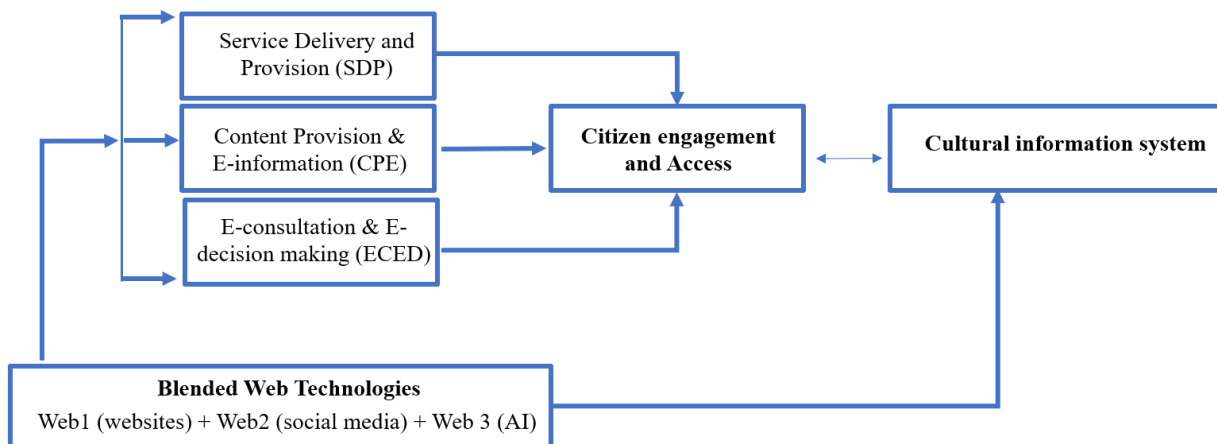
Figure 1 CIS conceptual model

Results/Discussion/Implication

Digital transformation Process flow: For African developing countries to evolve into sustainable digital economies, concerted efforts and innovative strategies will need to be employed. The CIS provides a strategic framework that can support this transition. The CIS leverages on technology, collaboration, and the promotion of socio-economic development. By providing various contextualized digital public services, the CIS can significantly impact the recipient countries.

The formula "Sustainable economy + Digital economy = sustainable digital economy" implies that by leveraging digital technologies, African developing countries can create a sustainable digital economy that is both socially and economically beneficial. In other words, sustainable economic practices and digital technologies work hand in hand to create a digital economy that supports economic growth and development.

To consider a CIS-led transformation, we will consider 3 key principles: First, countries will emphasize on high-value activities such as healthcare, education, research and development, and clean technology innovation. Secondly, there should be a shift towards circular business models that minimize waste and harness existing resources more efficiently. Finally, an incentivization strategy will be setup to ensure equitable outcomes for all actors in this digital economy, regardless of size and purchasing power. By applying these practices, African economies can approach the status of sustainable digital economies whereby all stakeholders gain and produce value. The CIS framework encapsulates the above principles.

What is the way Forward?

The researchers propose a five-step process guide based on the Cameroonian use case and in our opinion, generalizable to most developing countries. This process heavily leans on comprehensive regulation, infrastructure, access and supply of digital services, open data policies, preparation of an able workforce, community engagement and the promotion of digital transformation at all levels.

- *Step 1: Enact Comprehensive Regulatory Framework:*

Cameroon must create National standards and regulations to govern digital economy operations. The unique use cases of digital technology for government institutions, businesses and the individuals must be taken into consideration for the development of this laws and they must apply locally, nationally, and internationally. Cameroon is well advanced in the strategizing of the digital sector as the Telecommunications Regulations Agency (ART) , National Agency for ICTs

(ANTIC) , the Ministry of posts and Telecommunications (MINPOSTEL) and CAMTEL lead this digital revolution from the government to engulf the individuals and businesses in the country.

The CIS framework allows developing countries to achieve data democratization and digital sovereignty which are essential for the contextualization and regulation of digital technology;

Data democratization refers to the process of making data more accessible to a wider range of people and organizations, allowing them to use it to make informed decisions and create new products and services. This involves breaking down barriers to access and sharing of data, as well as ensuring that the data is of high quality and can be used in a meaningful way. The goal of data democratization is to empower individuals and organizations to make better use of data, leading to increased innovation, efficiency, and competitiveness. This is especially the case with Open-government data. More data-adaptive approaches could revolutionize the public sector and place a lot more control in the hands of individuals

Digital sovereignty is the concept that a nation or organization has the right to govern its own use of data and digital resources. This includes the ability to make decisions about how data is collected, stored, and used, as well as the ability to control access to and use of digital resources within its jurisdiction. The goal of digital sovereignty is to ensure that a nation or organization has the ability to protect its interests and values in the digital realm, and to prevent unwanted influence or interference from other nations or organizations. An example of this within the Cameroonian cyberspace will be for the CIS to allow only content that aligns to Cameroonian laws.

- *Step 2: Invest in the Necessary Infrastructure*

Technology advancements alone cannot start a digital economy. The country should create the necessary infrastructure such as broadband networks, mobile networks, data centers, cloud computing services etc. The MINPOSTEL and private organizations such as MTN and Orange are continually expanding the scope of digital infrastructure in Cameroon. In January 2023, cellular mobile connections rose by +8.9% (+2.0 million) bringing the total number of Cameroonians using cellular networks to 23.92 milion Cameroonians i.e., 84.6% compared to the central African average of 58%. This shows the readiness of Cameroon to absorb technological growth. (DataReportal, 2023).

- *Step 3: Increase Access to Digital Services*

For citizens to benefit from a digital economy, they must have access to various digital products/services. The government should work with companies to extend such services globally so more people can participate in this new economy. In the CIS framework, social networking is integrated with e-government and contextualized online services to create a comprehensive platform that enables people to connect, collaborate, and access information and services easily.

E-government & E-participation: In terms of e-government, the CIS can provide a platform for government agencies to digitize their services, automate processes, and provide online access to citizens, improving service delivery and transparency. Regarding e-democracy, the CIS can facilitate citizen participation and engagement through various means, including online voting, public consultations, and social media platforms.

Online services: The Cultural Information System (CIS) can provide a range of online services to its users, including e-health, e-tourism, e-commerce, e-banking, and e-learning. The CIS can provide a centralized platform for these services, making them easily accessible to users across Cameroon

Social networking: Social networking in the context of the Cultural Information System (CIS) refers to using online platforms and tools to connect people, facilitate communication, collaboration, and knowledge sharing. The CIS leverages social networking to enhance citizen

participation and engagement, improve government services and accountability, and promote economic development and growth. Social networking platforms have transformed the way people interact and share information, becoming powerful tools for businesses, organizations, and governments to engage with their stakeholders and constituents. It can be used to build online communities, facilitate dialogue and participation, and support civic engagement and digital citizenship/patriotism

The impact of social media on public discourse has transformed the dissemination and debate of information. Combining e-government platforms with Cameroonian-centered social networking and other online services has the potential to create new forms of political participation, improve patriotic feelings and increase access to relevant country information Friedland et al. (2006).

- *Step 4: Prepare a Labour Force for the New Economy*

In order to take advantage of digital technologies, citizens must be trained in areas related to analytics, machine learning, coding languages and other related skills relevant for the new economy. This is already happening with training of software engineers in private and public institutions across the country.

This workforce integrates structures such as ANTIC, ART and MINPOSTEL to help strengthen Online Security Protocols and ensure safety, reduce risk of cyber-attacks aiding governments adopt secure protocols. For contextualized online services such as e-commerce activities, users need to have trust specially when it comes to finance data going across servers all over the world in electronic form. The students within the country should be exposed to local technological inventions allowing our education system to reflect local essence and innovation.

- *Step 5: Community engagement*

Digital innovation must be spread to the population. The CIS is designed to be used by individuals, businesses and government agencies. With support from leaders such as ART, ANTIC, MINPOSTEL and CAMTEL, innovation can be easily spread across the community. The CIS amplifies the rate Community engagement and penetration due to its accommodation of the non-internet population.

Cameroon Digital Communication Brackets

In Jamuary 2023, cellular mobile connections in Cameroon stood at 84.6% of the population. This statistic saw an 8.9% rise from the 2022 numbers. The internet penetration rate in Cameroon as of January 2023 according to the international telecommunication Unit, stood at 45.65%. Mobile connections are 84.6%, and the most used social media (Facebook) had a penetration rate of 13.8%. (DataReportal, 2023).

This means that 38.95% of Cameroonians with a mobile connection do not use the internet. Also, 31.85% of Cameroonians using the internet do not use social media. A few questions arise from the analysis of these numbers:

How can we provide contextualized digital services to the 10 million+ Cameroonians having a cellular network but not using the internet?

How can we provide contextualized digital services to the 9 million+ Cameroonians who use the internet but do not use social media?

The CIS framework provides functionalities for all cellular mobile connection users and includes use cases for Internet users, non-internet users, smartphone and non-smartphone users. Three methods have been expertly elaborated to implement features in tech-deficient environments based on internet availability, quality and device type (feature phone vs smartphone) and availability.

USSD (Unstructured supplementary Service data): The CIS framework aims to provide telecommunication access to a larger population of Cameroon, including non-internet and non-smartphone users. To achieve this, the CIS system will integrate USSD technology, which allows

for offline communication between any device with a sim card and the platform's database. This will ensure that all users, regardless of their phone type, have access to a limited range of services available through the CIS platform. With this approach, the CIS framework will touch a significant part (84.6%) of Cameroon's 28.28 million inhabitants and not just the 12.89 million (45.6%) with internet access, making it a crucial tool for promoting digital inclusion and bridging the digital divide. Users without a smartphone and users in areas with a poor internet connection have other options.

Dataless mode (zero-rates): The CIS framework will implement a dataless mode by which telecom providers (MTN, Orange, Nextel, CAMTEL) will waive data bandwidth charges for accessing the CIS on the smartphone. This will be achieved through a zero-rating mechanism. The CIS will provide a stripped-down text-only version of its mobile website, similar to the case of Facebook Zero. Apps such as Facebook, Tik tok and WhatsApp have had specialized offers curated by MTN and Orange in Cameroon.

The nature of the information on the CIS platform provides significant value to users even in a text-based format. In African countries the cost of data is very high. In Burkina Faso, the price of data could go up to 15.31 US dollars per 1GB in 2022. (Oluwole, 2023; Statista, 2022).

Shared economy: Revisiting the Cyber Café

By aligning with shared economy ideas like cyber cafes, the CIS framework can further democratize access to information and services, helping to bridge the digital divide and promote more inclusive economic growth across Africa. This can be an effective strategy to increase access to technology, especially in areas where personal devices or reliable internet connections are not widely available. By embracing this concept, African countries can provide a low-cost alternative to owning personal devices, while still providing access to digital services and information for the masses. (Salvador et al. 2003).

Cyber cafes can play a significant role in increasing access to the CIS in Africa. As the CIS has a web version, it can be accessed through cyber cafes, providing an alternative means of accessing the platform for those without personal devices or internet connectivity. This aligns with the CIS's aim of providing telecom access to all, regardless of their device or internet access. By leveraging existing cyber cafe infrastructure, the CIS can extend its reach to more people and accelerate its adoption across Africa.

In conclusion, the CIS implementation is a significant step towards achieving digital inclusion in Cameroon. The use of dataless mode, USSD technology and the rebirth of the Cybercafé ensures that more people can benefit from the services provided by the CIS such as social networking, e-government services and contextualized online services.

Global, continental and National CIS use cases: Case of Cameroon

Overall, a critical realist perspective on the CIS emphasizes the complex interplay between technological innovation, social context, and economic incentives, and underscores the importance of understanding these factors in order to fully realize the potential of the system for positive change. Cameroon has 3 transformative long-term projects which a cultural information system can highly impact:

a. Global: 17 United Nations Sustainable Development goals 2030

The CIS has the potential to make a significant impact on the implementation of the UN Sustainable Development Goals in Africa through its ability to support digital transformation. Various existing initiatives currently leverage ICTs to support the SDGs, and the Cultural Information System (CIS) through its triad of digital empowerment: Access, technology and community engagement provides a unique opportunity to build on these successes and develop

novel approaches towards achieving the SDGs. With careful consideration and planning, the CIS can be a game-changer in the quest for sustainable development in African communities, and beyond. The CIS offers a unique approach that transcends traditional models of technology implementation and can play a critical role in shaping the future of Africa's digital economy.

b. Continental: African union All Africa Digital Economy Moonshot 2030

A major continental project launched in 2019 is the African Union's Digital Economy Moonshot for Africa program that aims to digitally empower every African citizen, company, and government by 2030, with a budget of $25 billion. This project has the potential to drive digital innovation in Africa, expand the economy, generate jobs, and enhance people's lives (Ngufor, 2021).

Africa's population growth rate is the fastest in the world at 2.7% per year, compared to a global average of 1%. It is also the youngest population with a median age of 20 years, and most of the youth will live in urban areas by 2045. This presents a huge market potential for e-payments, e-commerce, and streaming services. Africa's current population of around 1.2 billion is projected to double over the next 30 years, making it an exception in a world of slowing population growth. These figures show why there is a growing interest in Africa's digital development using the continental approach. (Leke et al. 2018; Mckinsey & company 2022).

The Cultural Information System's ideology (CIS) unlike the African Union's strategy of treating African digital development as a *continental* all-in-one effort, is to first empower the Individuals and their businesses, then link the country through its government who serves those individuals and regulates their businesses and lastly connect all these African countries using a continental value exchange initiative. A CIS is a small conscious step towards innovation, growth, and development. Collective Intelligence acquired through participation contributes to the transfer of power and knowledge from individuals to groups.

c. National: Cameroon 2035 emergence Plan

The Cameroonian government, through the Ministry of Economy, Planning and Regional Development (MINEPAT), initiated the normative approach to formulate Cameroon's Vision for long-term development. Cameroon's 2035 plan draws inspiration from countries like Tunisia, Indonesia, Morocco, and Malaysia, which have made significant strides in digital growth.

Tunisia's digital sector contributes 11% to their GDP, while 66.7% of their population uses the internet. In Indonesia, 73.7% of the population uses the internet, and approximately 2.9% of GDP is generated from the digital sector. In Morocco, the digital sector contributes 5.6% to their GDP, and 74.4% of their population uses the internet. The *Malaysian* digital economy makes up a whopping 18% of their GDP, and 84.2% of their population uses the internet. These figures demonstrate the potential impact of a thriving digital economy and underscore the need for African nations to invest in their digital infrastructure.

This paper demonstrates the potential impact a Cameroonian cultural information system on improving the digital sector of Cameroon. By creating an inclusive and efficient ecosystem where every Cameroonian citizen, business and government agency shares valuable information, we can move our country towards the 2035 promise land.

Socio-cultural and Socio-economic Factors

Socio-cultural factors play a significant role in the adoption and utilization of technology necessary for transforming African developing economies into digital economies. These factors include social, economic, and political considerations, as well as cultural and social issues. The adoption of technology in Africa is hindered by factors such as inadequate infrastructure, low literacy levels, and a lack of digital skills. The political climate and government policies also have an impact on

the adoption of technology. For instance, political instability and corruption can deter investors from investing in digital infrastructure. Additionally, internet penetration is low in many African countries, and the cost of internet is high, making it challenging for individuals and businesses to access the information and services needed to participate in a digital economy.

The adoption and use of Information and Communication Technologies (ICTs) in Africa is a multifaceted issue with various sociological dimensions. These include issues related to social norms, cultural practices, gender dynamics, education levels, and access to resources.

Socio-cultural factors:

Language diversity: Cameroon has over 250 local languages, which may make it challenging to develop a national digital economy framework that is inclusive and accessible to all citizens.

Educational background: The literacy rate in Cameroon is about 77%, which means that a significant portion of the population may not have the necessary skills to participate in a digital economy.

Cultural attitudes towards technology: Cameroon has a strong cultural identity and may have unique attitudes towards the use of technology, which could impact the adoption and implementation of the 6-step process.

Socio-economic factors:

Income inequality: Cameroon is a lower-middle-income country, and income inequality may make it challenging for some citizens to access the necessary infrastructure and digital services to participate in a digital economy.

Rural-urban divide: There is a significant divide between rural and urban areas in Cameroon, with urban areas having better access to infrastructure and digital services. This divide may impact the feasibility of the 6-step process in rural areas.

Political instability: Cameroon has a history of political instability and conflict, which may impact the government's ability to implement a comprehensive regulatory framework and infrastructure development necessary for a digital economy.

The CIS framework if well implemented will empower African developing economies. The success of fundamental technology and its commercial use cases is influenced by novelty and complexity. Novelty refers to how new a product is to the public, while complexity reflects the diversity of partners needed to generate value using the technology. For the successful implementation of a cultural information system in any African developing country, it is imperative to align their CIS design to their transformative projects.

Implications and recommendations for policy makers and practitioners

Here are a few thought-provoking Implications and recommendations to consider:

Policymakers should focus on developing a comprehensive regulatory framework that takes into account cultural, social, and economic factors unique to each African country.

Policies that promote open data should be enacted to allow global access and use of shared information, which could unlock opportunities for countries.

The cost of internet and low internet penetration should be addressed by policymakers to allow for maximum access to digital services using the cultural information system approach rather than more global approaches.

Governments should collaborate with telecom operators and stakeholders to ensure that the CIS is fully implemented and reaches its full potential.

African countries need to take a curated and controlled approach to digital technology transition, carefully blending aspects of each web era to ensure that the digital economy is inclusive and accessible to all citizens.

There should be support from government bodies, including the Ministry of Posts and Telecommunications, ANTIC, ART, and other IT departments, to make this inclusive strategy a reality in Cameroon.

Providing support in the form of funding, policy formulation, and collaboration with telecom operators to make inclusive strategies, like the CIS, a reality.

Developing and implementing policies that address socio-cultural factors that may influence the adoption and utilization of ICT in African communities, such as language barriers and traditional beliefs.

Prioritizing efforts to increase internet penetration and lower the cost of internet services, which are critical enablers of digital innovation and ICT adoption.

In summary, policy makers and practitioners should prioritize the adoption and implementation of a Cultural Information System to drive sustainable development in African developing economies. This can be achieved through a range of initiatives, including policy formulation, public-private partnerships, digital literacy programs, and efforts to increase internet penetration and lower the cost of internet services.

Conclusion

In conclusion, this paper has analyzed the potential impact of the Cultural Information System (CIS) on the transformation of African developing countries into sustainable digital economies, using Cameroon as a case study. The paper highlights the importance of the CIS as a tool for driving sustainable development in African developing countries and provides valuable insight for policymakers and practitioners seeking to promote the adoption and utilization of ICT in these contexts. By emphasizing that the CIS belongs to everyone, including individuals, businesses, and governments, the paper envisions an ideal digital economy that is remodeled and controlled by the people. The CIS has the potential to empower African citizens, foster entrepreneurship, and contribute to the achievement of the UN SDGs. Overall, this paper highlights the transformative potential of the CIS for sustainable development in Africa and advocates for its widespread adoption and utilization in the region

References

Aghaei, S., Nematbakhsh, M. A., & Farsani, H. K. (2012). Evolution of the world wide web: From WEB 1.0 TO WEB 4.0. *International Journal of Web & Semantic Technology*, *3*(1), 1-10.

Anderson, C. (2008). Debating the long tail. *Harvard Business Review*

DataReportal (2023), "Digital 2023 Global Digital Overview," retrieved from https://datareportal.com/reports/digital-2022-global-overview-report f

Friedland, L. A., Hove, T., & Rojas, H. (2006). The networked public sphere. *Javnost-the public*, *13*(4), 5-26.

Goldhaber, M. H. (1997). The attention economy and the net. *First Monday*

Granovetter, M. S. (1973). The strength of weak ties. *American journal of sociology*, *78*(6), 1360-1380.

Kobilov, A. U., & Rikhsimboev, O. K. (2021). A global approach to assessing competitiveness digital economy. *Экономика и бизнес: теория и практика*, (11-2), 115-119

Korovkin, V. (2019). National digital economy strategies: A survey of Africa. *ORF Issue Brief*, *313*, 1-5.

Kurzweil, R. (2004). *The law of accelerating returns* (pp. 381-416). Springer Berlin Heidelberg.

McKinsey & company (2022) "The future of payments in Africa", retrieved from https://www.mckinsey.com/industries/financial-services/our-insights/the-future-of-payments-in-africa

Mulaydinov, F. (2021). Digital economy is A guarantee of government and society development. *Ilkogretim Online*, *20*(3), 1474-1479.

Mutula, S. M. (2008). Digital divide and economic development: Case study of sub-Saharan Africa. *The Electronic Library*.

Ngufor, A. A. (2021). CAMEROONIAN DIGITALIZATION: Remodelling and Controlling Our Cyberspace by Embracing the CULTURAL INFORMATION SYSTEM [Kindle version]. CRISBY VENTURES Publishing. Retrieved from https://www.amazon.fr/CAMEROONIAN-DIGITALIZATION-Remodelling-Controlling-INFORMATION-ebook/dp/B09GKVTG1Y

Oluwole, V. (2023), "The high cost of mobile data in Africa: Top 20 most expensive countries". Business insider Africa retrieved from https://africa.businessinsider.com/local/lifestyle/20-african-countries-with-the-most-expensive-mobile-data-prices-is-your countryon/sjxr35p#:~:text=The%20high%20cost%20of%20mobile%20data%20in%20African%20countries%20can,in%20the%20African%20telecom%20industry.

Raymond, E. (1999). The cathedral and the bazaar. *Knowledge, Technology & Policy*, *12*(3), 23-49.

Salvador, T., Sherry, J. W., & Urrutia, A. E. (2003). Less Cyber, More Café: Design Implications for Easing the Digital Divide with Locally Social Cyber Cafes. In *Organizational Information Systems in the Context of Globalization: IFIP TC8 & TC9/WG8. 2 & WG9. 4 Working Conference on Information Systems Perspectives and Challenges in the Context of Globalization June 15–17, 2003, Athens, Greece* (pp. 323-337). Springer US.

Statista (2022) "Price for mobile data in Burkina Faso as of 2022", retrieved from https://www.statista.com/statistics/1272956/price-for-mobile-data-in-burkina-faso/#:~:text=One%20gigabyte%20of%20mobile%20internet,1GB%20cost%2015.31%20U.S.%20dollars.

Tang, N. H., & Lee, Y. C. (2016). Korean and Vietnamese User Loyalty: KakaoTalk Case. In *AMCIS*.

The Fourth Industrial Revolution by Klaus Schwab: Effoduh, J. O. (2016). The fourth industrial revolution by Klaus Schwab.

Tyfield, D. (2012). The Economics of Science: A Critical Realist Overview: Volume 2: Towards a Synthesis of Political Economy and Science and Technology Studies.

Webster, F. (2014). *Theories of the information society*. Routledge.

Williams, R., & Edge, D. (1996). The social shaping of technology. *Research policy*, *25*(6), 865-899.