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Assessment of E-government Development in the Economic and Monetary Community of Central African States (EMCCAS)

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Abstract: Information and communication technologies (ICT) are a powerful support not only for modernization and productivity gains but also for good governance in developing countries, notably through the transparency it engenders in the administrative treatment procedures.
This study, a pioneer in the target sub-region, assesses the development of e-government in the Economic and Monetary Community of Central African States (EMCCAS). This evaluation is done through the e-government development index of the pre-cited sub-region, comparing it with similar sub-regions on the basis of United Nations surveys between 2003 and 2016.
This paper finally shows stagnation and weak development of e-government in the region studied. This is due in part to the inadequate financial resources allocated to the task, a private sector that is not very active in developing local content, the weak telecommunication infrastructures, and inadequate institutional and regulatory frameworks.
Keywords:E-Government, E-Government Development Index (EGDI), Human Capital Index (HCI), Developing Countries, Online Services Index (OSI), Telecommunication Infrastructure Index (TCI), E-participation Index, Economic and Monetary Community of Central African States (EMCCAS).

1. INTRODUCTION

E-Government (e-Gov) refers to the use of information and communication technologies (ICTs) as a platform for the exchange of information, the provision of services and transactions with Citizens, businesses and other branches of government [5]. It provides useful transparency, brings efficiency and modernizes administration in developing countries. It is also recognized as a lever for other production sectors, and therefore, as a powerful tool for human development and essential in achieving internationally agreed development goals, including sustainable development.

On the basis of these advantages, several governments of the Economic and Monetary Community of Central Africa States (EMCCAS) are committed to developing a strategy for the growth of the digital economy in general and e-government in particular [23][42][43].

The purpose of this study is, therefore, to evaluate and analyze the state of e-Government in the EMCCAS sub-region, on the one hand, and to highlight the challenges that lie ahead in achieving this ambition. The study is based on secondary data derived mainly from the UN surveys conducted by the United Nations Department of Economic and Social Affairs (UNDESA) of the United Nations Department (2003 - 2016) [28-36].

The sections of this paper are organized as follows. First, the definitions of e-Government and a review of the related literature; followed by a description of our motivation and the study methodology for which we depict the indicators of the United Nation e-Government Development Index. The paper is continuing with the evaluation and analysis of the parameters of e-Government in the EMCCAS sub-region compared to those of other carefully selected reference sub-regions. Finally, we have a section that makes recommendations before the conclusion of the study.

2. DEFINITIONS AND REVIEW OF LITERATURE

In the following subsections, we first present the main definitions of "e-Government" according to the literature; then we review the key publications related to our subject of study.

a. E-Government definitions

In the literature, we find several definitions of e-Government; hereafter we decline the most significant, although all state almost the same thing. For the United Nation (UN), e-Government can be referred to as "*the use and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people*" [34].

For the Organization for Economic Co-operation and Development (OECD), e-Government is defined as "*the use of information and communications technologies (ICTs), and particularly the Internet, to achieve better government*" [21]. According to the World Bank, "e-Government" refers to "*government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a*

variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth and/or cost reductions" [39].

According to PALVIA and SHARMA [24], "*E-Government refers to the delivery of national or local government information and services via the Internet or other digital means to citizens or businesses or other governmental agencies ... E-Government is a generic term for web-based services from agencies of local, state and federal governments. In e-Government, the government uses information technology and particularly the Internet to support government operations, engage citizens, and provide government services. The interaction may be in the form of obtaining information, filings, or making payments and a host of other activities via the World Wide Web*".

For Spirakis, Spiraki, and Nikolopoulos [27], e-Government stands for "*the use of Information and Communication Technology in the transformation of government; primarily aiming to the improvement of accessibility, effectiveness, and responsibility. It is based on the diffusion of the information and the information policy development. Electronic government guides to increasing citizens' participation and active citizens' development affecting the mechanisms of democracy*".

Gil-Garcia and Luna-Reyes defined e-Government as: "*the use of information and communication technologies in government to provide public services to improve managerial effectiveness and to promote democratic values and mechanisms; as well as a regulatory framework that facilitates information intensive initiatives and fosters the knowledge society*" [15].

Finally, the ITU report [17] distinguished the terms digital government, electronic government (e-Government) and electronic governance (e-Governance) in the following way:

- *The digital government* refers to the "*umbrella term that comprises all uses of information and telecommunication technologies in the public sect*or" [12].
- e-Government is one aspect of digital government; it refers to the provision of governmental services by ICTs, particularly over the Internet.
- "*e-Governance refers to the use of ICTs for organization of political activity within and beyond nation states. E-governance "is one of a wide range of competing terms pertaining to use of new communications technologies, such as the Internet and mobile telephony, for political and governmental purposes. Other widely used terms that have overlapping meaning include: electronic democracy (e-democracy), online democracy, cyber-democracy, virtual democracy, online governance, teledemocracy, e-participation and e-deliberation" (Chen 2008).*

b. E-Government development literature survey

The literature on e-Government is very prolific, so in the following, we will limit ourselves to the scope of our study. According to GRANT [13] and GRÖNLUND[14], e-Government implementation is motivated by the objectives of improving efficiency, quality of information and relations between administrations - administered, and by better governance. ANDERSEN[2] discussed the role of management in achieving these goals and outlined five key strategic challenges facing managers in the deployment of e-Government; namely: "*assessing the demand paradox of e-Government; ensuring that gate-keeping mechanisms of the street-level bureaucrats are not eroding the dynamics of e-Government; use of IT to decrease the high labor intensity in public service provision; revisiting the employees' readiness for e-Government; and building competences within government to ensure dynamic use of IT*".

Achieving a high level of electronic readiness is one of the stated objectives of developing countries in their move towards e-Government. To this end, these countries agree to invest time, money and effort to measure their level of e-readiness. DADA [8] critically examined the concept of e-readiness, with a focus on developing countries and shown that, by themselves, these measures do not affect the development because they tend to focus on the environment and ignore the level of organization. In this perspective, he proposed a new model, giving more importance to readiness and acceptance of technology, in order to better understand the situation. Moreover, YUNIS and SUN [40] studied empirically the role of social, technological and economic factors in improving countries readiness to implement e-Government. Their mathematical model has shown that infrastructure, human capital, online presence level and interactive services initiated by the government are significant determinants of e-Government readiness.

A decade ago, the context of e-Government development in OECD countries was comparable to that of developing countries today. That is why a glance at that context can shed light on the progress of e-Government in developing countries. The context of e-Government development in OECD member countries was characterized by the need for information society development, a rapid technological change, a clear digital divide between disadvantaged groups and the others, concerns about privacy, many expectations for citizens, and the existence of organizational, legislative, regulatory and budgetary barriers. Numerous studies have been conducted on e-Government in Europe and OECD countries. Among them, Edwin LAU [19] analyzed this context and the issues of e-Government in OECD member countries, including the context in which e-Government was deployed, and then

showed why it was necessary to offer a shared vision to the concerned actors, and finally, he concluded by recommending the final adoption of e-Government.

On the other hand, Agnès BRADIER [6] shows that e-Government is one of the pillars of the e-Europe 2005 action plan, aimed at modernizing and bringing public services online, boosting e-Commerce, deployment of broadband networks and improving IT infrastructure security. In this study, the author reviews the situation of e-Government in Europe, and identifies the priorities to be followed and situates ICTs in relation to democracy. Among these priorities is interoperability, facilitating access to cross-platform services and promoting exchanges of good practices. At that time (nearly a decade ago), all European countries had already developed e-Government implementation policies, with detailed action plans, under the coordination of the e-Europe. As a result, the offer of e-Government has steadily increased, to the extent that the Internet is used to completely replace the other modes of services for most public services. Today, in Europe, e-Government has become widespread and e-services have become one of the key indicators for the evaluation of public sites [11][16][35]. Moreover, for the average user, "ease of use" is the first qualitative criterion of appreciation of a public website. The other criteria for e-Government assessment are procedure simplification, information optimization and workflows, and improvement of exchanges between public authorities.

The coordination of e-Government in Europe has been realized through the adoption of the European Union Digital Agenda, in which e-Government is declined in a set of measures to exploit the potential of ICT, in order to provide public services to citizens more effectively and cost-reduction [9]. The first version of this plan, carried out in the early 2000s, enabled the governments of all Member States to exchange good practices and carry out several projects aimed at developing cross-border e-Government services. Progress had also been made in various sectors: re-use of public information, exchange of information on public procurement, European-scale electronic identity systems, and access to public services by electronic means in all EU countries. At the end of this program, the Commission of the European Union realized that cross-border e-Government services were scarce and little used when they existed. It has, therefore, planned a new program aiming at making European public administrations open, flexible and collaborative in their relations with citizens and businesses.

The EU 2011-2015 e-Government Action Plan enabled the development of digital tools facilitating access and use of public services. E-Government should evolve towards an offer of public services designed by citizens and businesses at their own request. The current trend of e-Government in EU is to have open and cross-border e-services in their design. The 2016-2020 E-Government Action Plan [10] was designed in this perspective, in order to modernize public administration, achieve the digital internal market, engage more with citizens and businesses to provide high-quality services, and finally make digital services faster, cheaper and more user-oriented. In order to achieve these objectives, the action plan comprises three political priorities: modernization of public administrations (in particular with the use of digital keys), increasing the mobility of citizens and businesses through cross-border interoperability, digital interaction between administrations and citizens/businesses for high-quality public services.

According to the experience of European Union, it can be inferred that the implementation of e-Government, therefore, requires the development of a global strategy in the form of a strategic plan, possibly associated with a master plan, in order to offer a shared strategic vision to the entire Administration. This would allow all public bodies to perceive the problems of coordination laying beyond their own services. This includes: strengthening coordination, improving collaboration, rapidly responding to changing skill needs, clarifying public-private partnerships, and monitoring and evaluating e-Government processes. Ultimately, the adoption of e-Government becomes an imperative perceived as early as the 1990s by the rulers, while the Internet was only in its infancy. To deploy e-Government, skills are needed to ensure good governance of ICT investments. Countries such as Gabon and those used as targets in this study are to a large extent in the situation of European countries a decade ago. This is why developing countries must draw on their experience to avoid mistakes. But above all, an evaluation of the existing is necessary; this is the purpose of our approach in this paper with regard to Gabon.

From the European Union experience, it appears that major obstacles can arise during the process of adoption and deployment of e-Government. In order to better control this process, ALGHAMDI et al [1] outlined in their study, the organizational requirements for the adoption of e-Government in developing countries. They provided a framework for assessing e-Government readiness, and identified seven main factors to be considered in assessing ICT readiness for e-Government implementation: "*E-Government organizational ICT strategy, user access, e-Government program, ICT architecture, business process and information systems, ICT infrastructure, and human resource*". This study is essential for assessing the availability of ICT at the organizational level when Public Services intend to improve the effectiveness of e-Government initiatives.

In the other hand, the success of e-Government depends not only on Government commitment but also on the willingness of citizens to accept and adopt public e-services. Although there is an abundant literature on e-Government in developed countries, for developing countries it is scarcer. To help to fill this gap, RABAA [25] conducted a study on the factors influencing the adoption of e-Government in Jordan. This study uses the Technology Acceptance Model (TAM) as a theoretical basis and correlates public perception of e-Government

with their attitudes toward adoption e-Government. Their analysis highlights four factors that have a significant effect on the adoption of government e-Services in Jordan: "*perceived credibility, perceived usefulness, perceived ease of use and computer self-efficacy*". It also shows that the perceived ease of use is the most important factor in the adoption of e-Government services by Jordanian citizens.

Finally, we are in the early days of scientific interest for e-Government in Central Africa. To date, there are no scientific or academic studies dealing with the topic of e-Government in the Economic and Monetary Community of Central African States (EMCCAS). This paper is, therefore, a pioneer in this field.

3. MOTIVATION AND STUDY METHODOLOGY

Africa has at least 11 sub-regional organizations in order to satisfy mainly the need for economic integration. Our study focuses on the evaluation of e-Government indicators in the Economic and Monetary Community of Central African States (EMCCAS) sub-region. This sub-region includes 6 countries, namely Cameroon, Congo, Gabon, Equatorial Guinea, Central African Republic and Chad. The main task of EMCCAS is to promote the harmonious development of the Member States with the establishment of a genuine common market.

In order to carry out our study, we relied on the methodology already developed by Ali A. Al-Wazir [5] and Pierre Moukeli [41], which we adapted and extended to the evaluation of sub-regions. This methodology consists in identifying the target sub-regions, whose situation is comparable, at a given moment, with that of the sub-region under study. Then we compare their indicators in order to identify the strengths and weaknesses of e-Government in the reference region, ie the Economic and Monetary Community of Central African States (EMCCAS) in our case.

Our study is based on data collected primarily from the United Nations e-government surveys (2003, 2004, 2005, 2008, 2010, 2012, 2014 and 2016).

The target sub-regions included in this study are:

- West African Economic and Monetary Union (WAEMU): the sub-region has the same indicators and economic structure as the Economic and Monetary Community of Central African States (EMCCAS). The WAEMU sub-region includes 8 countries;
- Southern Africa: The 2016 e-Government survey conducted by the United Nations Department of Economic and Social Affairs (UNDESA) divided the Africa countries into four zones: eastern, central, western and southern. We have chosen this last region, which includes 5 countries, for its similarities to the sub-region studied on the one hand, but also because it has the advantage of being one of the most dynamic in Africa in terms of e- government.

To carry out our study, we used universally accepted comparison indicators; namely those defined by the United Nations. This is why we first depict the United Nation E-Government Development Index (EGDI). The United Nations E-Government Survey tracks the progress of e-Government development via the E-Government Development Index (EGDI). The EGDI is devoted to assessing e-Government development at the national level. It is a composite index based on the weighted average of three normalized indices. One-third is derived from the Telecommunications Infrastructure Index (TII) based on data provided by the International Telecommunications Union (ITU); one-third from a Human Capital Index (HCI) based on data provided by the United Nations Educational, Scientific and Cultural Organization (UNESCO), and one-third from the Online Service Index (OSI) based on data collected from an independent survey questionnaire that assesses the national online presence of all 193 United Nations Member States [35].The following is the description of the EGDI:

- **Telecommunications infrastructure index (TCII):** This Index is an arithmetic average composite of five indicators: (i) estimated internet users per 100 inhabitants; (ii) number of main fixed telephone lines per 100 inhabitants; (iii) number of mobile subscribers per 100 inhabitants; (iv) number of wireless broadband subscriptions per 100 inhabitants; and (v) number of fixed broadband subscriptions per 100 inhabitants. The International Telecommunication Union is the primary source of data in each case [35].

- **The human capital index (HCI):** It consists of four components, namely: (i) adult literacy rate; (ii) the combined primary, secondary and tertiary gross enrolment ratio; (iii) expected years of schooling; and (iv) average years of schooling [35].

- **Online Service Index (OSI):** The Online Service Index reflects differences in levels of e-Government development among countries. To proceed in the Online Service Index (OSI) values for 2016, a total of 111 researchers, including UN experts and online United Nations Volunteers (UNVs) from over 60 countries with coverage of 66 languages assessed each country's national websites in the native language, including the national portal, e-services portal and e-participation portal, as well as the websites of the related ministries of education, labor, social services, health, finance and environment as applicable. Then the raw OSI index scores were created. The final online index value for a given country is equal to the actual total score minus the lowest total score divided by the range of total score values for all countries [35].

- **E-participation index (EPI):** The e-participation index (EPI) is derived as a supplementary index to the UN E-Government Survey. It extends the dimension of the Survey by focusing on the use of online

services to facilitate the provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation") and engagement in decision-making processes ("e-decision-making") [36].

4. Economic and Monetary Community of Central African States (EMCCAS) e-Government analyze and assessment

We note a growing interest in the development of the digital economy in general, and e-government in particular, in the majority of studied sub-regional countries. There is now a formalized strategic vision in most countries. Thus, we have a digital Gabon plan designed in 2009, a Digital Chad 2017-2020 plan, and a Cameroon digital 2020 strategic plan. There was also a national digital forum in 2016 in Congo.

These plans, which support the development of e-government, lead to the following main recommendations:

- Development of broadband infrastructure,
- Development of local content,
- Strengthening the legal and institutional framework,
- Development of digital trust.

a. E-Government Index in EMCCAS's countries

Figure 1.a shows the evolution of the e-government index from 2003 to 2016 in the EMCCAS sub-region. There is a permanent evolution between 2003 and 2010 followed by a slight decrease between 2010 and 2012 and finally stagnation between 2012 and 2016.

The sudden regression in 2012 is due in particular to the fact that data from the Central African Republic were not provided during this period because of political and social unrest.

All the countries in the sub-region are stagnant between 2012 and 2016. The best growth is in Equatorial Guinea, where the e-government index has remained difficult to reach above the region's average since 2008.

The study of countries in Figure 1.b clearly shows two groups of countries: Gabon, Cameroon, Congo and Equatorial Guinea on the one hand, and the Central African Republic and Chad on the other; these two last countries are below the sub-regional average. We note that countries that have not yet adopted a digital vision in the observed period do not evolve sufficiently. Thus, the digital vision of Chad begins in 2017 and that of the Central African Republic is not yet asserted. These two countries also do not have access to the sea and therefore no easy access to regional marine optical fibers, and they are among the poorest countries in the world.

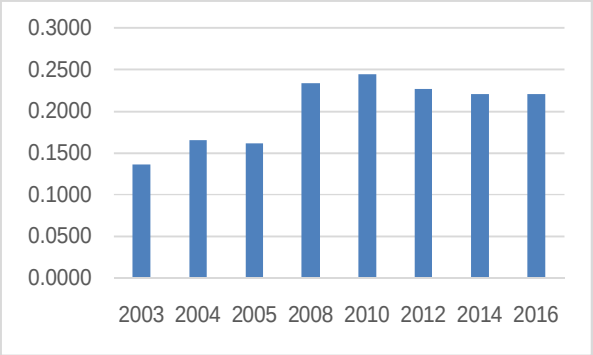

Figure 1.a: EMCCAS's E-Government Index Trends

Figure 1.c shows the evolution of e-government between the three sub-regions of comparison: EMCCAS, WAEMU and SOUTHERN AFRICA. It is observed that the first two zones cited above have the same level in 2003 and 2016 despite a slight advantage of the EMCCAS zone between 2005 and 2014.

The Southern region is clearly the most dynamic with South Africa driving. The southern Africa sub-region has 3 countries in the top 20 countries for e-government in Africa (South Africa, …, …), the EMCCAS sub-region has one (Gabon) while the WAEMU sub-region does not. It is remarked that an area that has a motor country tends to pull it up. Countries of reference should be encouraged in the zones.

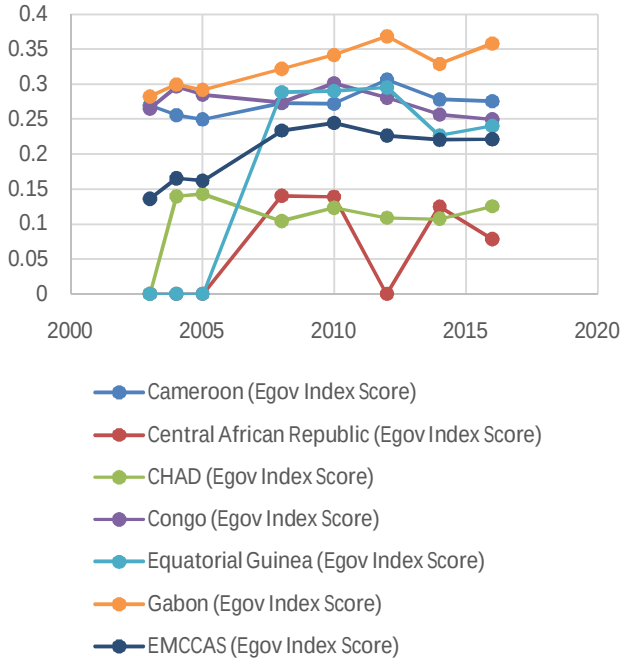

Figure 1.b: EMCCAS's countries E-Government Index Trends

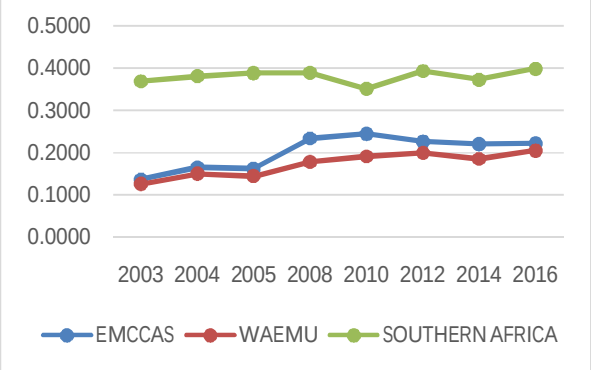

Figure-1.c: EMCCAS and other sub-regions E-government Index Trend

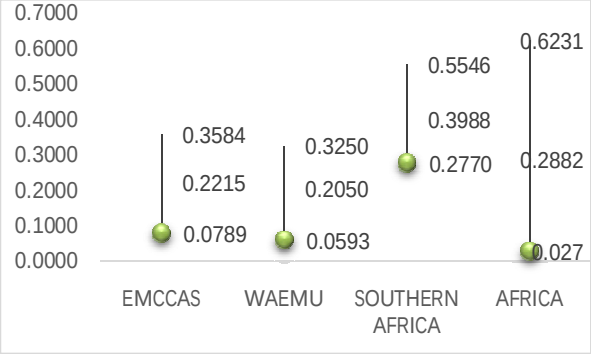

Figure-1.d: Sub-regional and regional average with maximum and minimum values of E-Government Development Index (EGDI) in 2016

As we saw in the previous chapter, The EGDI, which assesses e-government development at the national level, is a composite index based on the weighted average of three normalized indices. Thus, Table 1 shows for 2016 and for the EMCCAS sub-region countries the behaviors of the following indexes: Online services, telecommunications infrastructure, and human capital.

Table 1: EMCCAS E-Government Development Index (EGDI) and its tree sub-components

Index / Countries	EGDI	OSI	TII	HCI
CAMEROON	0,2759	0,2174	0,131	0,4794
CENTRAL AFRICAN REPUBLIC	0,0789	0	0,0381	0,1985
CHAD	0,1256	0,1377	0,0476	0,1917
CONGO	0,2497	0,0435	0,1713	0,5344
EQUATORIAL GUINEA	0,2403	0,0797	0,1237	0,5174
GABON	0,3584	0,1522	0,3068	0,6162

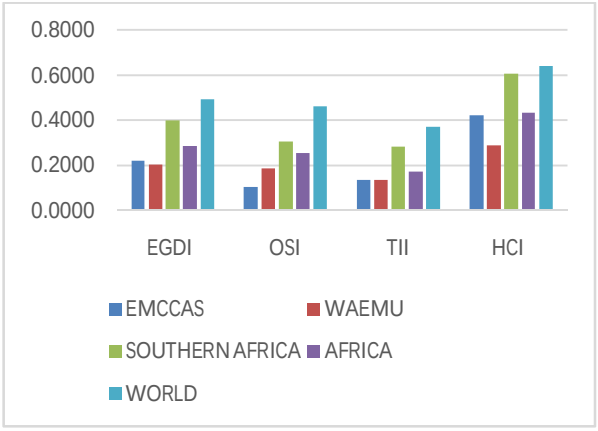

Figure 1.e: EMCCASE-Government Index compared with other regions

Ultimately, the EMCCAS sub-region is among the least developed regions in the world with an EGDI of less than 0.25. The Figure 1.d shows that the average for this sub-region is lower than the African average.

This work raises the question of improving the EMCCAS's EGDI to at least to 0.4 in the next few years. Telecommunication infrastructure index and online service index have a lower rank than human capital. This doesn't mean that HCI ranked good, but it gives more emphasis to more focus on online service and telecommunication infrastructure indicators [41].

b. Online Services in EMCCAS's countries

The governments of the sub-region countries have conceived a vision in the development of the digital in general and of the e-Government in particular with an objective like the development of the local contents.

The Figure-2.a shows online service trends for selected countries and shows categories on online service data including emerging information services, enhanced information services, transactional services and connected services. The Figure 2.b shows the OSI characteristics of the sub-regions studied. For example, in Gabon, we note the development of a government web portal (www.governement.ga), which gives information from the Administration, but also the implementation of a tax declaration (www.etax.dgi.ga) and visa (www.dgdi.ga) online.

There are also several initiatives in Cameroon in the development of local content, including a government web portal (http://www.spm.gov.cm). Several Ministries have websites. In this country, there is also a full digitization platform for customs procedures and dematerialization of public procurement procedures (http://www.publiccontracts.cm), the fruit of cooperation with South Korea, a model country for e-government.

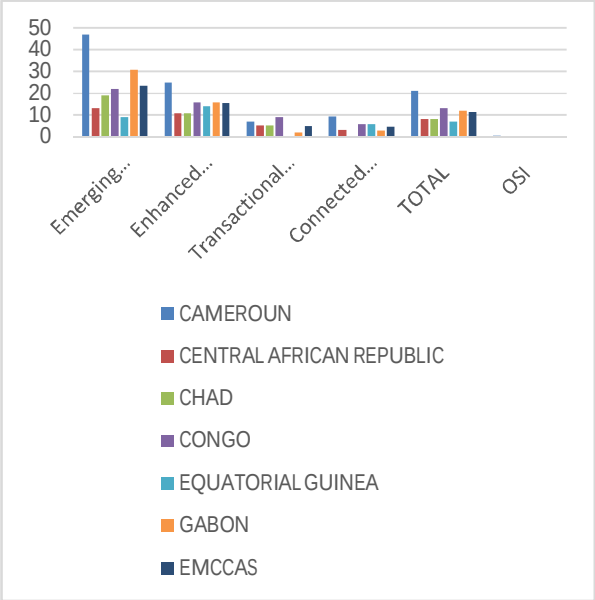

Figure 2.a: Online Service Index in EMCCAS region

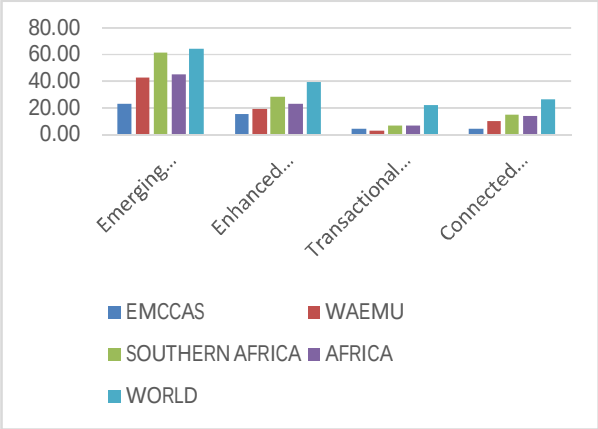

Figure 2.b: Online Service gap between EMCCAS and other sub regions.

Indeed, several initiatives are underway. Cameroon and Gabon are the most advanced countries on this index in the sub-region, but this tendency to dematerialization and online information is observed in all the countries studied.

These initiatives are still marginal because the global index of the sub-region remains below of the African average. So there is still work to be done. The weak points are:

- Lack of dynamism of a private sector that could help the development of content. The creation of incubators should be multiplied;
- Insufficient regulatory and legal framework;
- Lack of data centers;
- Inadequate financial resources allocated to the development of government content. Awareness-raising and pedagogy should be conducted among decision-makers to demonstrate the relevance of e-government in terms of improving governance.

c. ICT Indicators of EMCCAS's countries

Today, each country in the sub-region has several Internet access providers, mainly telephony operators that provide both voice and internet services.

Figure 3.a shows that individual connectivity to broadband internet is still modest in 2016. It should be noted that the exploitation of 3G and 4G networks by operators in recent years has significantly improved connectivity but this tendency does not seem to be reflected in the UN present survey.

The Internet connection in Africa in general and in the EMCCAS sub-region, in particular, is mainly done by mobile phone. Africa is experiencing one of the highest growth rates in the world in the use of mobile phones. Gabon and the Congo, sparsely populated countries have the mobile penetration rates among the highest in the sub-region.

With the advent of mobile telephony, fixed telephony is becoming more and more marginal and reserved for the administration and the companies. Its expansion is now very limited and often carried out by historical telecom operators. This explains the low rate of fixed telephony.
The surveys show that broadband connectivity (fixed or mobile) is still very low. Broadband access remains the major challenge for governments to continue their efforts to build national optical fiber on the one hand and consolidate their connections to international submarine cables on the other.

5. FINDINGS AND CONCLUSION

It is no longer necessary to demonstrate that e-government fundamentally improves the governance of the least developed countries, particularly with the transparency it offers.

This paper assessed and analyzed the current state of e-government in the EMCCAS sub-region, based on surveys conducted by the United Nations Department of Economic and Social Affairs of the United Nations Department from 2003 to 2016.

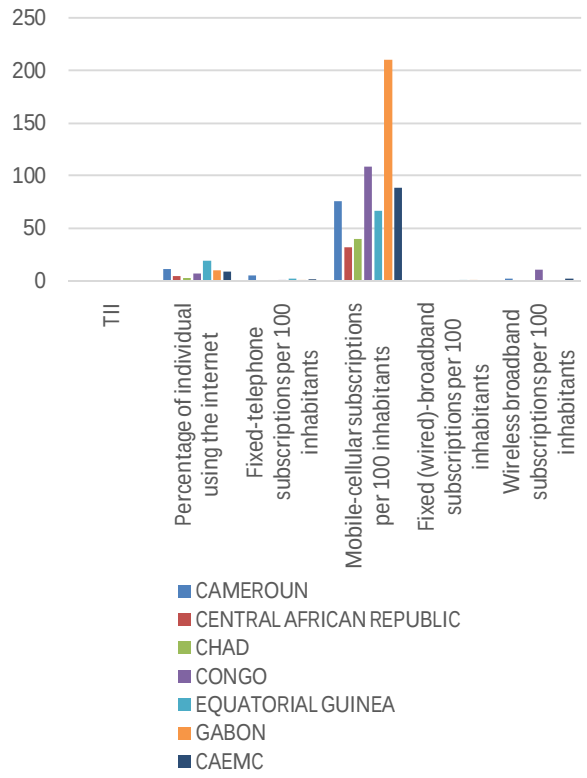

Figure 3.a: Telecommunication Infrastructure Index(TII) in EMCCAS subregion in 2016

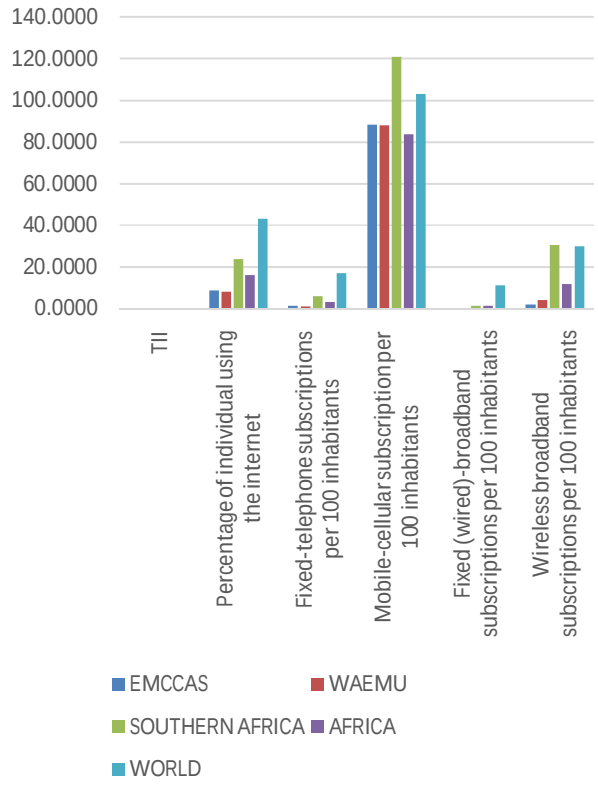

Figure 3.b: TII gap between EMCCAS and other sub regions.

The analysis of the indexes shows the heavy task of the competent authorities to position the sub-region in the middle EGDI by 2020, ie an EGDI index between 0.25 and 0.5. For this, the EMCCAS sub-region could found inspiration from the Southern African sub-region with an index of about 0.4.

To improve its indexes, the target sub-region countries will have to continue implementing their digital development plan, in particular by:

- The development of broadband infrastructures,
- The construction of sub-regional data centers,
- The construction of sub-regional exchange points,
- The development of the partnership in the implementing of applications,
- Strengthening of the legal and institutional frameworks,
- Training of qualified human resources,
- High-level leadership,
- The development of collaboration with the world's top 10 countries;
- The establishment of sub-regional programs,
- The inclusion of citizens.

We noted that the EMCCAS sub-region, with an e-government administration development index (EGDI) of 0.2215 in 2016, is one of the least advanced sub-regions in the world. This poor performance of EMCCAS countries in terms of e-Government is correlated with the low level of economic development in this region, weighed down by the presence of two landlocked countries among the poorest in the world. On the other hand, these two countries are regularly disturbed by armed conflicts on their territory (RCA) or at the borders (Chad). The analysis of the impact of these conflicts on the evolution of their EGDI seems to be an interesting open problem.

This scientific study, which deals with the problem of e-government from a sub-regional perspective, is pioneering. It provides useful information not only to sub-regional officials but also to national policymakers, identifying weaknesses in e-government and making recommendations for improving the indexes.

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