ICT in Algeria: Reality and Prospects

LAHMAR Abbes [1], BENZIDANE Hadj [2]

[1] University of Mostaganem, Algeria, (abbess.lahmar@univ-mosta.dz)

[2] University of Mostaganem, Algeria, (ben_zidane@livea.fr)

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Abstract

Many countries in the Developing World, including the least developed ones, are making significant investments in ICT (information and communication technology),even with very limited financial resources and weak incomes of these nations, ICT uses contribute to their economic progress, social growth, and access to the digital economy in which information a competitive challenge for firms and economies. This economy is concretized in a high digital environment and a strong infrastructure, in which knowledge plays a key role in economy. Algeria has made considerable efforts and initiatives to improve its digital environment and provide access to ICTs.

This research paper aims to study the reality of the digital environment in Algeria and its integration into these technologies knowledge and information domain. It makes some concluding remarks about the current status of ICT in Algeria and the research needed to determine the contribution that ICT will make in this country.

Key words: digital environment, Internet and mobile, ICT, digital gap, digital economy.

JEL Classification Codes: D83, O33, P21.

ملخص

تقوم العديد من البلدان في العالم النامي بما فيها البلدان الأقل نمواً باستثمارات كبيرة في مجال تكنولوجيا المعلومات والاتصالات، وهذا على الرغم من محدودية الموارد المالية وضعف دخل هذه الدول،

Auteur correspondant: LAHMAR Abbes, **Email:** abbess.lahmar@univ-mosta.dz

واستخدامات تكنولوجيا المعلومات والاتصالات تساهم في التقدم الاقتصادي والنمو الاجتماعي، بالإضافة إلى الاندماج في الاقتصاد الرقمي، حيث أن المعلومات أصبحت تشكل تحديات تنافسية للمؤسسات والاقتصاديات، ويتم تجسيد هذا الاقتصاد في بيئة رقمية عالية وبنية تحتية قوية، حيث تلعب المعرفة دورًا رئيسيًا في الاقتصاد، وقد بذلت الجزائر جهوداً ومبادرات كبيرة لتحسين بيئتها الرقمية وتوفير الوصول إلى تكنولوجيا المعلومات والاتصالات.

تهدف هذه الورقة البحثية إلى دراسة واقع البيئة الرقمية في الجزائر ومقومات اندماجها في اقتصاد المعرفة والمعلومات، مع تقديم بعض الملاحظات حول الوضعية الحالية لتكنولوجيا المعلومات والاتصالات في الجزائر والبحث عن المتطلبات اللازمة لتحديد المساهمة التي تقدمها هذه التكنولوجيا في هذا البلد.

كلمات مفتاحية: البيئة الرقمية، الانترنت والهاتف النقال، تكنولوجيا المعلومات والاتصالات، الفجوة الرقمية، الاقتصاد الرقمي.

1. INTRODUCTION

Information and communication technology has brought about major changes in the global economic climate which gives to developed countries significant potential to achieve capital accumulation. In the second half of the 1990s, the United States achieved strong economic growth with low inflation and increased labor productivity; this prompted economists to announce the birth of a new economy linked to advances in information and communication technology. These changes led the United States to a real economic miracle, ten years of steady growth. To keep abreast of these developments, Algeria has given a great space to the telecommunications sector, and announced a plan for reform, restructuring and modernization of the sector since 2000.

Algeria has provided the necessary ground to allow ICT to grow and develop, it has core resources that encourage sector development, and push it to adopt a clear strategy to provide support structures so that there will be a stronger integration into the new economy. Algeria's reforms have played a major role in securing competition, diversifying the economy and improving services within the framework of a comprehensive concept for the development of the national economy and the policy of economic openness. These reforms did not exclude any area from mobile phone, Landline, Internet and satellite communications; this is part of the efforts made by the country to expand the investment in the infrastructure of the ICT sector.

Despite the intervention of the Algerian government in the reforms of the telecommunications sector, and the development of information and communication technology through the increasing proportion of Internet users. ICT in Algeria has not played its role in moving the economy forward.

1- The reality of ICT in Algeria.

According to the International Telecommunication Union (ITU), the number of fixed and mobile subscriptions worldwide increased at a high rate during 2000-2010.The participants in developed countries reached 114.2 per 100 in habitants and 70.1 per 100 in developing countries. The International Federation estimates that the number of mobile phone subscriptions will be roughly equal to the world population.

As for the Internet, recent years have witnessed a significant increase in the number of users, for example in 2010, the number of Internet users reached 110.9 million in Africa and 63.2 million in the Middle East. These ratios have changed in 2015 (Figure 01), Africa recorded a growth rate of 9.8% and Asia 48.2%.

Figure 1. Internet users in the world.

Source: www.Internetworldstats.com/stats.htm November 30.2015.

Between 2012 and 2014, the number of Internet subscribers in developing countries was approximately 31 per 100 inhabitants, which is weak compared to the global average. Developed countries registered 77 participants per 100 inhabitants. In Algeria, the telecommunications sector has developed and is directly open to the private sector through reforms. The Ministry of Supervision, which has become the Ministry of Information and Communication Technology, has also been renamed as an initial step to restructuring the sector. (HUSSEIN, 2005, p. 60).

2-1- Reform of the telecommunications sector in Algeria.

The first results of the reform of the telecommunications sector in Algeria were the agreement of mobile operator (the case of foreign companies: Djezzy and Ooredoo). This adoption was one of the main axes of government programs which revolve around the policy of economic openness, trade liberalization, Euro-Mediterranean partnership agreements and the World Trade Organization. In light of the reforms carried out by Algeria, which have reached the level of postal services, two institutions have emerged:

- "Algeria Telecom" and its branches Mobilis operator;
- And Djawab Internet services;
- "Algeria Post" is a public institution with an industrial and commercial advantage.

The results of reforms in the telecommunications sector emerged in 2001.Several companies' had compete to gain a market part as Orascom Telecom Egypt, Telefonica of Spain, Orange Telecom of France, Portugal Telecom for a mobile license, the Egyptian company Orascom received the offer at $ 737 million, after obtaining the agreement, the company launched its new network Djezzy GSM in the field of mobile phones. The Kuwaiti company obtained a license to operate a mobile phone network on December 02nd, 2003 through the offer of the winner, which was estimated at 421 million dollars, this project is being jointly funded by Gulf Investment Corporation and United Gulf Bank. (FAYçALE, 2005, p. 66), Wataniya Telecom launched its brand Nadjma with attractive services and features on August 25th, 2004. By new standards in the telecommunications industry, these transformations have helped Algeria to develop the telecommunications sector and generate revenue of $ 380.86 million for telecommunications and 902.94 $ million for mobile operators in 2004. (GHASSAN, 2005, p. 15)

The main activity of Algeria Telecom was adopted on March, 01st2001by the National Council for State Contributions within the development and improvement of public and private networks, to facilitate access to communications and to increase the supply of telephone services in different regions. This regulation allows the promotion of communications as an essential engine of the economy. The aim of these reforms is to improve services and encourage the telecommunications sector as a key sector in the face of competition. (BENELKADI, 2003, p. 05), market openness and liberalization, in general.

The main objectives of the reforms were:

- Increase and diversify the supply of postal and telecommunication services;
- Improve the quality of services offered, competitive pricing and development of postal and telecommunication networks;
- Offer Financial services for post, promotion of national savings and expansion of the range of services;
- Promote communication as a key economic sector for growth in a competitive economy.

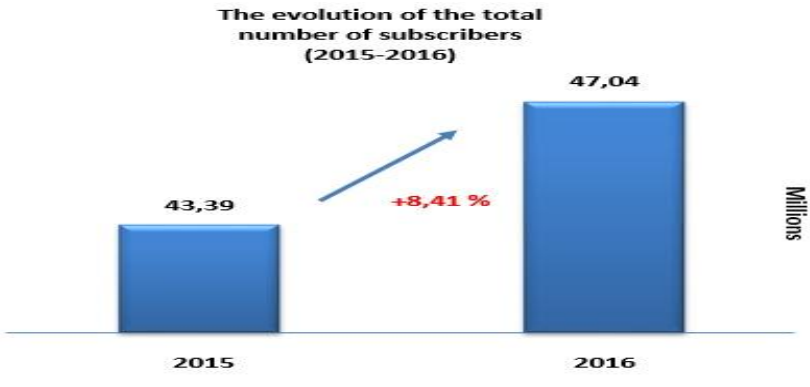
The main activities targeted within the Government program are to:

- Reformulate the legal and regulatory framework;
- Create distinct operators for postal and telecommunications services;
- Promote private sector participation, investment and development of Internet services.

2-2- Mobile and Internet in Algeria.

Since restrictions on the telecom market have been lifted, mobile and fixed-line services in Algeria have developed considerably. The mobile phone operator is a successful model in Algeria, where statistics show that the number of subscribers exceeded 32 million in 2012. (HENNI, 2006), while the number of subscribers did not exceed 9 million during the middle of the year of 2005.The mobile sector in Algeria has introduced the entry of 3G mobile services. So, the number of subscribers in the third generation according to the statistics of the Control Authority in December 2014 rose to 8 million and 231 thousand subscribers, and that the total subscriber density (GSM + 3G) was 115.1% for a population of 39.5 million. The total mobile phone holder reached about 3.65 million subscribers in 2016, an increase of 8.41% compared to the previous year. The total number of subscribers reached 47 million active subscribers (**Figure 2**); 20,362 million subscribers to the GSM network or 43.28%, 25,215 million in the 3G network or 53,60%, and 1,465 million in the fourth generation network(percentage of 3.11%), evolution of the total sum of active subscribers (in million) distributed across each trader are represented as follows: Algeria Mobile Telecommunications 17.34 million, Optimum Telecom Algeria 16.37 million and Wataniya Telecom Algeria 13.33 million subscribers.

Figure 2. Development of the total holder for mobile subscribers in Algeria**.**



Source: R A T, Mobile Market Observatory, Algiers, 2016, p 03.

In recent years, telecom companies have been able to hold direct and indirect business positions; the competition in telecommunications services has contributed to the increase in the number of mobile subscribers with strong competition among the three dealers. The mobile market has achieved an important qualitative leap after entering 3G mobile services (the marketing process began on the 15th of the same month).

Table 1. Mobile Telephone Density.

Population density (million)	39‹500
Telephone Density	94‹3%
Telephone Density (3rd generation 3G)	20‹8%
Total telephone density (mobile + 3G generation)	%115‹1

Source: Regulatory Authority for Telecommunications(R A T), 2014

Mobilis is the third largest 3G subscribers with 3,639 million followed by Ooredoo 3,607 million, and Djezzy 985,000 subscribers. It is noted from the previous table that the total subscription density (GSM + 3G) reached 115.1%, these statistics remain preliminary pending the audit of the interests of the control authority, in terms of market share. Djezzy is the market leader in GSM with 47.9%, Mobilis 29%, followed by Ooredoo at 23.1%.The third generation, Mobilis leads the standings by 44.2%, Ooredoo 43.8% and Djezzy which began marketing this service on July 5, 2014 with 12% of the market share. (ARPT, December, 2004). If the mobile phone has been a big success in Algeria, the fixed line is still suffering from delays. The sector remained the monopoly of one public trader where it achieved about 9.1% of the users at the end of 2007, during the same year the fixed market share was 11% compared to 89% market share of mobile phone in 2010, then awaited 53.471 requests for a fixed line with a total number of 166 commercial agencies and 110 branches and recording 4425 telephone services, 212.040 multi-service kiosks lines. Algeria Telecom had revealed the presence of3.3 million fixed line subscribers at the end of March 2016.

With regard to the Internet since the introduction of Ministerial Decree 98-257 of August 1998 which ended the state monopoly of Internet services, the number of users increased by 3 million in 2006. Before, the number was not more than 150.000 in 2000 compared to the population. The employment rate remains low according to the statistics of the International Telecommunication Union amounted to 12.50% in 2010. Despite the slow start to the service of hosting sites, Algeria has recorded a quantum leap in the level of services.

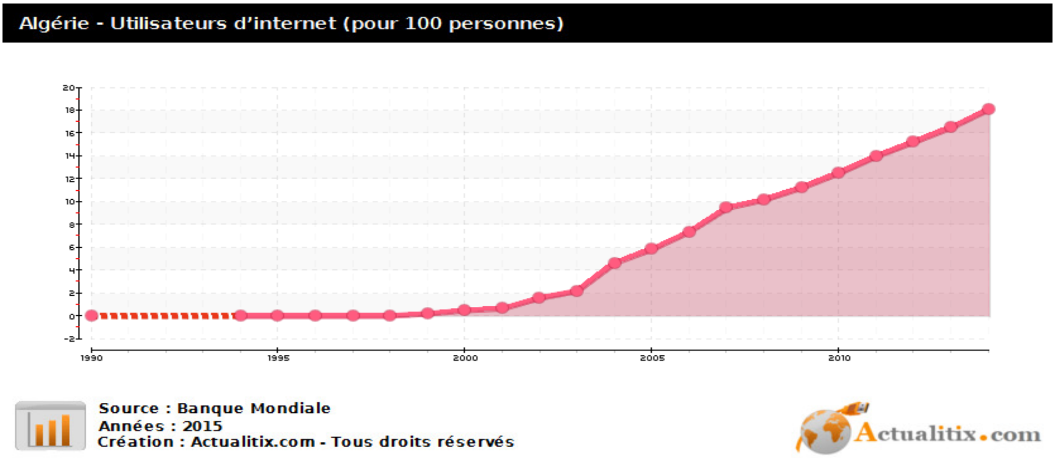
The situation improved slightly as a result of the adopted strategy which began from the decision to:

- Reduce prices;
- Expand the activity of regional administrations;
- launch the high-speed Internet ADSL. (ARPT, 2014).

Algeria Telecom chose several foreign partners to develop Internet services including the German group that employed the latest technologies adopted in Europe to strengthen the capabilities of the Algerian network which is still suffering from short ages. Algeria Telecom has also worked to remedy the significant delays in telecommunications infrastructure, provided a national fiber optic backbone and allowed the connection between the north and south of the country to meet the services of the Internet and banks and institutions. The backbone consists of the following parts:

- The northern backbone has a capacity of 2,5Gbit/S which is operational since September 2002;
- Northern backbone with a capacity of 10Gbit /S, which has been operational since June 2004;
- The southern backbone has a capacity of 2,5Gbit /S, which has been operational since March 2005.

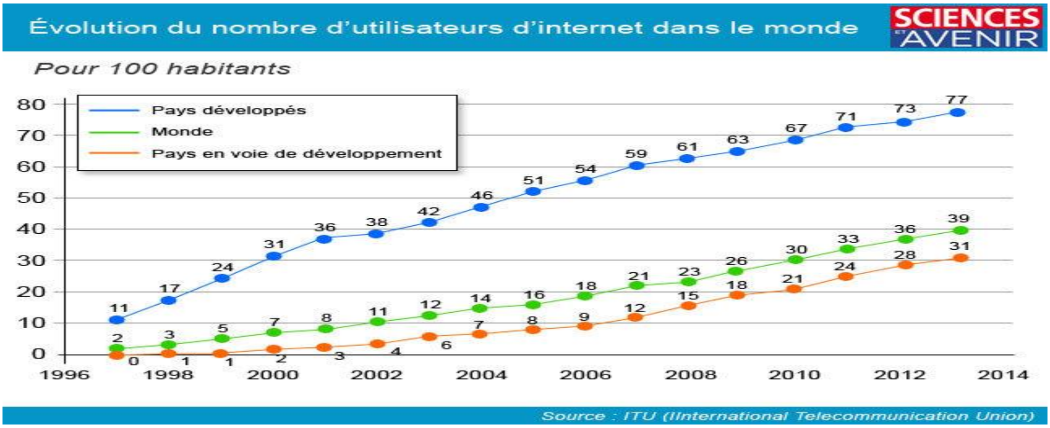
Figure 3. Internet usage in Algeria per 100 persons.



Source: The World Bank, 2015.

In fact, Algeria's reforms and structural adjustments of the technological development have weakly led its economy, as in developed countries, both through their weak contribution to the generation of ICTs or poor degree of use in a way that contributes to economic growth. As information, the number of Internet subscribers in developed countries between 2012 and 2014 was about 77 subscribers per 100 inhabitants while in developing countries it was 31 per 100 in habitants as the figure 04 shows.

Figure 4. Evolution of the number of Internet users in the World.



Source: statistics International Telecommunication Union (ITU), 2015.

The World Information Technology Report 2015 revealed the failure of the developing countries' economies including Maghreb countries. To invest in ICT, Algeria registered 1920000 users in 2007and moved the number to reach more than 7 million and 700 thousand users in 2011. The Internet in Algeria has been very dynamic after this year, the number of users (18.09 per 100 people) in 2014compared to the ratio in 2008 (12 users per 100 people). The period 2013/2014 marked the emergence of 3G services which contributed to the increase in the number of users; the Ministry of Posts and Communication Technology recorded 8.213.000 subscribers according to the statistics of November 2014with an increase in the number of ADSL subscribers and fixed wireless broadband services, the number of subscribers doubled and reached more than 9 million and 816 thousand subscribers by the end of 2014.The density of Internet in Algeria during the year 2016 was 71.71% and the total number of participants increased to 29.538.700which did not exceed 18.581.032 subscribers in 2015.

Table 2. Evolution of the total number of Internet subscribers in Algeria.

	2015	*2016*	*Development*
ADSL subscribers	1838492	2083114	***31،13%***
Fourth generation 4G LTE subscribers	423280	775792	***28،83%***
3G mobile subscribers	16319027	25214732	***51،54%***
4G mobile subscribers	/	1464811	/
Wimax subscribers (Telecom Algeria)	233	251	***73،7%***
Total Internet Subscribers	18581032	29538700	***09،51%***

Source: Regulatory Authority for Telecommunications, (2016), The internet market in Algeria, P 04.

Large gaps still exist in high-speed internet as private sector investment declines compared to what was lived up to be; there are only 250 million subscribers from developing countries in high-speed Internet although there are many promising World Bank projects and initiatives for these countries, as example we find the Incubators Network programs for Development to assist small and medium enterprises of more than 80 countries and WBI courses to make policies. However, these projects are not carried out on a large scale with the models not fully mature.

3- ICT Development Index in Algeria.

In 2015, the ITU report on the ICT Development Index showed that the Republic of Korea was ranked first. It was one of the top ten economies in the rankings, from Europe (Denmark, Iceland, Sweden, United Kingdom, Luxembourg, Switzerland, Netherlands, and Norway) along with another economy from Asia (Hong Kong, China).All of these economies are characterized by higher incomes reflecting the strong correlation between the high levels of performance in the index and the rise in gross national income per capital. (ITU, 2015), The report also showed that Tunisia ranked first in the Maghreb, ninth in the Arab world and 93 in the world **(Table 03)**.

Table 3. Reality of the Maghreb countries in the ICT Development Index.

Country	*Maghreb countries ranking*	*World ranking*
Tunisia	9	93
Morocco	10	99
Algeria	12	113
Mauritania	16	150

Source: ITU statistics, 2015.

There have been modest successes in terms of using the Internet and improving ICT infrastructure between 2010 and 2015, Morocco ranked 99th in the world and the second in the Maghreb followed by Algeria in third place in the Maghreb and 113 in the world. Despite the improvements in some ICT indicators in the Maghreb countries, their applications remained limited in certain areas such as e-mail services and websites unlike developed countries that use the network in other areas.

3-1- ICT constraints and requirements for improvement

The development of ICT in Algeria was not an effective booster of the national economy. In fact, the Algerian economy has continued to grow by exhausting its large natural resources without technical development being a determining factor in the development strategy. Indeed, Algeria has lagged far behind in digital areas. Despite all the efforts of e-Algeria project, the impact of the ICT sector on economic development is very limited and restricted, for this cause that’s why it is not enough to build a digital economy.

The Regulatory Authority for Posts and Telecommunications has revealed its annual report for 2014, that ICTs contribute only 2.9% to national GDP. This ratio is very low compared to the global average of 7% . (OCDE, 2015, p. 22), In Morocco, there are three fixed-line operators, a competitive market for four million individuals and companies, and ICT contributes to 7% to GDP. In Tunisia, the ratio is more than 13%.The main obstacles that negatively affect the digital readiness in Algeria and the degree of their advancement are in discussion to think about finding suitable solutions to activate the digital environment and develop the national economy.

3-2- Constraints to ICT development in Algeria.

From 2012 to 2016 Algeria invested $ 5 billion dollars in the ICT domain without creating an economic boost in this strategic sector. But the entry into the digital economy requires an appropriate environment through which information and knowledge will be disseminated, produced and used efficiently in all fields. It also requires identifying constraints and difficulties related to ICT integration and their interaction with economic services. In general, there are several factors that led to the delay of Algeria in activating this sector, including some of the following points:

- Existence of a structural backwardness of the Algerian economy and its dependence on oil revenues;
- Lack of confidence in online transactions and payment, and non-widespread use of electronic signature;
- Weak communication infrastructure with unstable telephone services;
- Lack of legal rules governing electronic transactions that are compatible with the requirements of the digital revolution;
- Lack digital gap, weak information and communication capabilities;
- Lack of availability of information on the Internet and low number of users of the network.

The weak role of the government and the contradictory choices sometimes produced an economic situation that made a feeble economy of Algeria that contributes to the weakening of its integration competency in the digital economy. This economy has become a rentier economy based mainly on oil wealth. Many experts have emphasized that there are significant challenges for financial and banking bodies in the use of ICTs in electronic payment and e-commerce; as these services are newly established in Algeria among which are the following:

- Algerian reluctance to use electronic payment cards;
- Lack of confidence in this type of transaction;
- Lack of communication and awareness of the importance of electronic transactions;
- Lack of electronic payment methods;
- Weak incentives and intellectual property protection laws;
- Weak security, evidence and special credit cards.

According to figures provided by the Federation of Financial and Accounting Frames, only 13.85% of the population in Algeria has a fixed line, which does not help to establish the rules of the information society. Algeria's position is far weaker than its material potential; this backwardness appears in the field of innovation, development research, infrastructure, legal framework and in the area of economic stimulus.

Reforms in the telecommunications sector have not met the expected objectives; Algeria lagged far behind other countries that have managed to turn the sector from a mere stock of opportunities into a major arm of the development strategy. It was therefore incumbent on Algeria to embark on new measures to continue the path of reforms.

4- Factors of Algeria's integration in ICTs.

Algeria has shown great interest in the ICT sector and has developed a strategy for the transition to e-government and set up a dedicated ministry for the development of the digital economy. The improvement of the digital environment has positively a reflect on the national economy and create new jobs as well as provide a great opportunity for enterprises to double the volume of sales and promotion of their products.

The widespread use of internet is the foundations of digital transactions where there is a continuous interaction, integration and coordination between information technologies on the one hand and economic activity on the other. The increase of 10% in high-speed Internet connections can bring growth to the country between 15% and 25%. (WORLD.BANK, 2011, p. 17), This changes the patterns of economic performance in business, commerce and investment from the traditional to the immediate stage (speed in performance).

A positive transformation in fields related to the digital economy requires the concentration on the axis related to communication technology with an improvement access to the internet. Its development and bridging the knowledge gap between men and women in addition to the dissemination of electronic culture and the improvement of legislative frameworks and laws that fit digital transactions. The following points reflect the list of key pillars of national digital strategies and include:

- Development of telecommunication infrastructure (access to broadband services and telecommunications);
- Promotion of the information technology sector, including internationalization;
- Activating e-government services;
- Trust in(digital identities, privacy and security);

- Encouraging the adoption of information and communication technologies in small and medium enterprises;
- Dissemination of e-culture with a focus on disadvantaged groups;
- Developing specialized skills in information and communication technology.

The e-Algeria project is a strategy that falls within the definition and implementation of a vision for the future and a practical approach to making the digital economy affect economic growth. The strategy aims to enhance the performance of the national economy and seeks to improve the capacity of education, research and innovation and the establishment of industrial constellations in the field of information and communications technology.

Algeria had to launch new measures to continue reforms while the state has shown great interest in the telecommunications sector and developed a coherent and strong work plan by supporting activities related to ICTs. However, the infrastructure in Algeria continues to suffer from some of the shortcomings that stand in the way of integration into the digital economy.

5- Conclusion:

We have tried through this paper to investigate the reality of ICT in Algeria. This technology has imposed a new ideology through real economic performance. In fact, Algeria, despite the efforts have to lay the foundations of the information society and improve the ICT infrastructure and the basic components of the digital economy, it still suffers from the problem of digital gap due to several factors which made a slow economic growth and ineffective implementation of ICTs. Indeed, Algeria is among the countries with intermediate results, and ICT has not played its role in moving the economy a head.

Algeria is in need of the challenges awareness it faces in the field of scientific and technological knowledge. It must adopt policies that consolidate the values of economic and social responsibility, supporting activities related to information technology. Thus, ICT should play its role in the cohesion with the economy alleviating poverty and deprivation and ensuring minimum social justice as a socio-economic route to improving access to ICTs and linking them to the objectives of economic and social development. Along these lines, this technology generates change and provides the environment that enables it to occur. Success is therefore primarily linked to the development of an integrated plan for the formulation of objectives and future choices which are central to the activation of integration into the digital economy.

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