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Digital culture as one of the pillars of digital transformation

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Abstract---In light of the techno-cognitive transformations taking place worldwide across political, economic, social, and cultural fields—which have profoundly impacted individuals and societies—and with the shift toward knowledge-based societies, the concept of development has undeniably changed. Development no longer relies solely on material aspects but rather on cognitive and cultural dimensions. Achieving meaningful and sustainable development is only possible through effective engagement with information by implementing policies, strategies, and mechanisms for monitoring, organizing, retrieving, and optimally utilizing knowledge. This study aims to shed light on digital culture as one of the most critical factors for the success of digital transformation. It explores the concept of digital culture, its components, domains, and its current state in Algeria. A descriptive methodology was adopted due to its suitability for the study. The findings indicate that digital culture plays a vital role in ensuring the success of digital transformation and serves as a fundamental pillar for it.

Keywords---digital culture, digital revolution, information technology, Algeria.

I. Introduction

The contemporary world is witnessing an enormous technological and cognitive revolution, marked by the widespread adoption of modern technologies such as computers, the internet, and mobile devices. Their use has become indispensable for individuals in performing numerous tasks and functions, whether at the personal, institutional, or societal level. The information revolution has led to an exponential increase in human knowledge—particularly scientific and technological knowledge—accumulating at an unprecedented pace. Globalization has also dismantled the barriers of distance and time, facilitating the free flow of information in all forms through digital communication networks. Today, technological advancement is the primary driver of economic progress in modern knowledge-based societies.

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Adapting to these rapid developments has become essential, particularly in how we search for, access, and efficiently utilize information. Knowledge production today is deeply rooted in cultural production, leading to a paradigm shift centered around digital information culture. It is crucial to reinforce this culture and continue investing in research to foster an informed mindset and awareness within society. This will empower individuals to identify their information needs, locate reliable sources, and optimize their use of knowledge, thereby acquiring self-learning skills.

Education is no longer confined to a specific time, place, or discipline; instead, it has evolved into lifelong learning—education for the sake of learning itself. There must also be a strong emphasis on investing in human capital, as it is the key driver in leveraging and activating knowledge and technological resources, whether positively or negatively. This is where the concept of information culture or digital culture emerged and flourished in today's information environment. Possessing its skills has become a mark of strength, while lacking them signifies a critical disadvantage.

Study Problem

The human factor is the cornerstone of development processes. Therefore, individuals should not live in a society ignorant of its own culture, as culture reflects the identity of a community. In a knowledge-based economy, it is essential to possess adequate and necessary information and skills related to computers and other technological competencies—collectively referred to as digital culture.

The Nature of Digital Culture

1. The Digital Economy and the Digital Revolution

The emergence of the knowledge society resulted from the integrated information revolution, where the transition from scientific knowledge to technological applications became faster and more economically efficient. This was further accelerated by the convergence of information processing technologies (computers and their applications) with digital communication technologies (networks and the internet). The true cognitive birth of the knowledge society dates back to the late 1990s (Ramadan, 2019, p. 1540).

The knowledge economy represents a new cognitive paradigm, both theoretically and methodologically, as well as in practical applications. One of its fundamental requirements is the use of modern information technologies, alongside an advanced and adaptive educational system—especially given the challenges contemporary societies face in managing vast amounts of information in all its forms. Consequently, the term digital culture has emerged as one of the most prominent concepts in recent years (Al-Agha, 2013, p. 38).

Scientific and technological progress has transformed knowledge into culture, succinctly encapsulating the essence of the knowledge economy. Many elements contributing to this society stem from advancements in science and technology, facilitated by the exchange of research outcomes. This has led to a new cognitive framework where sciences play a central role, and digital technologies exert a profound and direct influence (Ramadan, 2019, p. 1540).

Technological advancements and the information and communications revolution have established an electronic culture known as digital culture, a defining feature of our era—often termed the "information age" or the "technological revolution." This shift has enabled societies to transition into information-based and digitally driven communities, integrating into modern communication networks and allowing informatics to permeate social and global spheres.

The digital revolution marks a transitional phase in human communication history. Innovations in communication technologies, coupled with the sweeping tide of economic globalization, have reshaped global media landscapes, impacting communication systems universally. Information alone is not power; power lies in the ability to access, process, and retrieve its components efficiently. This requires

mastery of information technology tools such as computers, software, the internet, and modern communication devices. However, technology alone is insufficient—emphasis must also be placed on science and human capital, including users, technicians, and societal awareness of the importance of transitioning into an information-driven society (Khodri, 2004, p. 5).

2. Conceptual Evolution Toward Information Culture (Digital Culture)

Individuals, communities, and nations require information about themselves and their environments to survive, make decisions, and solve problems across personal, social, professional, and educational domains. A common thread uniting all members of society is the need for precise, immediate information to facilitate decision-making and problem-solving.

Given that information culture is an interdisciplinary subject, Dr. Nabil Ali highlights the overlap between culture and information systems. Culture, as some define it, is the acquisition of knowledge to refine critical thinking, elevate taste, and enhance control over one's environment. Whether culture is viewed as an intellectual product or a social construct encompassing knowledge, beliefs, and acquired traits that integrate individuals into society—or as a marker of elite distinction or a reflection of lived social realities—information remains the medium through which this intellectual output is expressed (Ali, 2010, pp. 22–24).

Thus, the relationship between culture and information is not linear but complex, involving deep-seated challenges and multiple stakeholders. As a forward-looking, multidisciplinary culture, digital culture supports universal empowerment. The concept of digital culture encompasses diverse meanings, depending on how culture is defined—whether as behavior, values, art, literature, ethics, creativity, or even customs and traditions—and how information is framed, whether in terms of management, technology, or economics.

The concept of information literacy was first introduced by researcher Paul Zurkowski in 1974 in his work *A Nation at Risk*, published in the United States. It called for a comprehensive review and improvement of educational systems to meet the needs of a knowledge society, advocating a qualitative shift toward dynamic learning environments prioritizing research, inquiry, and student skill development. This approach aimed to foster independent information-seeking abilities, moving from passive, rote learning to lifelong self-education—a cornerstone of modern educational systems.

Given its pedagogical origins, various international organizations and professional associations have proposed definitions for information culture. One of the most prominent is from the International Federation of Library Associations and Institutions (IFLA), which emphasizes promoting reading and writing cultures by enhancing public library spaces and sustaining robust, inclusive information environments for all societal members (Ben Zineb, 2020, pp. 333–334).

3. The Concept of Digital Culture

1. The Concept of Culture

Despite the frequent use of the term "culture," there is no general consensus on its precise meaning. Instead, numerous definitions exist, depending on various approaches—historical, evolutionary, structural, psychological, and normative—each differing in how they define the nature, components, characteristics, and functions of culture (Al-Buraidi, 2008, p. 12).

Ogburn defined culture as encompassing material objects, social systems, and the social patterns that guide human life (Abu Jamea, 2009, p. 8). Meanwhile, Démorgon (2000) traces the Latin origin of the term culture to the cultivation of land, while linguistically, it refers to nurturing the mind and refining human character (Nouiga, 2003, p. 53).

Bonnell & Hunt (1999) highlight that cultural concepts have been widely debated among scholars, particularly with the development of anthropology. They argue that culture represents "social life" in its broadest sense, including prevailing beliefs, concepts, and practices within a society (pp. 35–39).

2. Digital Culture

Digital culture is a strategic approach proposed by experts in today's dynamic, complex digital information environment. It is considered an essential life skill and a relatively new concept in social sciences, analogous to health culture (pertaining to health) or environmental culture . These terms denote mastery of a specific domain or the cognitive behaviors enabling individuals to interact effectively within it.

At its core, digital culture empowers individuals to use digital applications (e.g., Facebook, Viber) for professional and personal tasks, as well as to access information through digital means. These practices have transcended trends or superficial behaviors, making digital illiteracy one of the most critical challenges for societies and individuals (Mohammadi & Bakhoush, 2021, p. 4).

The International Society for Technology in Education (ISTE) defines digital culture as:

"An interconnected system of strategies, knowledge, skills, standards, rules, controls, ideas, and principles guiding the optimal and ethical use of digital technologies. It involves smart and secure utilization, managing digital content access and creation, ensuring equitable distribution, leveraging modern technologies' benefits, mitigating risks, and promoting best practices." (Ben Zineb, 2019, pp. 420–421).

Other key definitions include:

- Ramadan (2019): "The ability to use computers and electronic services to engage confidently in modern societal life, enabling individuals to accomplish professional and personal tasks." (p. 1548).
- Nabti & Boutmadjt (2012): "The skills and knowledge required to participate in key activities using ICT—computer use, information retrieval/storage/production/presentation, and online collaborative networking." (p. 2080).
- Loli (2017): "The proficiency in using digital applications to complete professional and personal tasks and access information via digital devices." (p. 67).
- Hafizi & Mezlah (2019): "The set of competencies enabling individuals to identify information needs, access, evaluate, and use information efficiently." (p. 187).
- Al-Sammak (2019): "The automation of institutional tasks via IT to reduce paperwork, streamline procedures, eliminate bureaucracy, and enhance accuracy—preparing administrations for e-government integration." (p. 639).

In summary, digital culture refers to an individual's knowledge and skills in using IT (e.g., computers, electronic services, and evolving applications) and their ability to interact with them effectively. Its essence lies in enabling confident, efficient use of digital tools for professional and personal responsibilities (Ramadan, 2019, p. 1548).

3. Key Components of Information Culture

In a seminal study, Nabil Ali identified three core components of information culture:

1. External Relations:

- Ties to national/global economic and political systems.
- Interaction with social systems transformed by IT.
- Engagement with other cultures, requiring nuanced understanding.

2. Internal Elements:

- Cultural thought, language, education, media, values, and innovation in cross-cultural methodologies.

3. Infrastructure:

- Cultural policies, human resources (producers and recipients), and accessible cultural information repositories (Ben Zineb, 2019, p. 428).

4. Domains of Digital Culture

Abdulhadi (2006) outlines digital culture's domains as:

- Library/resource organization.
- Information access/use, search behavior, and source evaluation.
- Research strategies, database navigation, email/website creation (p. 20).

Al-Wali (2017) emphasizes youth proficiency in digital communication tools (computers, smartphones, internet) and virtual relationship-building via social media—a space liberated from traditional social constraints but governed by technological and virtual norms (p. 68).

III. Foundations of Digital Culture

1. Dimensions of Digital Culture

Digital culture is crucial at the individual, institutional, and societal levels. For **individuals**, those lacking computer and internet literacy face a form of "knowledge illiteracy"—ignorance of digital technologies and their applications—akin to the illiteracy of reading and writing in the early 20th century. An individual's success is increasingly tied to their digital literacy; the higher their proficiency, the greater their access to jobs and opportunities. For **institutions**, survival and competitiveness depend on adapting to digital systems and rapid technological advancements. Digital culture is the gateway to the digital age. At the **societal level**, globalization and its challenges in knowledge, technology, production, and trade underscore the urgency for developing nations to embrace digital culture to bridge gaps with advanced economies and achieve scientific and economic progress (Mohammadi & Bakhoush, 2021, p. 5).

Digital culture comprises three dimensions:

1. **Computer Literacy**:
    - Recognizes computers as future replacements for pens, paper, and traditional management.
    - Requires overcoming fear of technology and transitioning from paper-based to digital workflows.
2. **Internet Literacy**:
    - Views the internet as the future of communication, education, commerce, and media.
    - Promotes global cultural exchange but warns against misuse (e.g., social media risks).
3. **Information Literacy**:
    - Treats information as the cornerstone of decision-making, leveraging data processing and AI-driven systems (e.g., expert systems) (Mohammadi & Bakhoush, 2021, p. 6).

2. Tools of Digital Culture

Key tools include:

1. **Digital Libraries**:
    - Host archives (texts, films, maps) in digital formats, accessible via networks (e.g., *World Digital Library*).
2. **Search Engines**:
    - Enable efficient online research and resource discovery.
3. **Specialized Databases**:
    - Organized repositories (e.g., academic journals) with citation tools.
4. **Blogs**:
    - Web platforms (e.g., *Blogger*) for time-stamped content (videos, news, personal entries).
5. **New Media**:
    - Social media and digital communication technologies that redefine public discourse and democratize expression (Ramadan, 2019, p. 1550; Al-Olawna, 2013, p. 668).

3. Challenges to Digital Culture

Common barriers (Mohammadi & Bakhoush, 2021, pp. 6–7):

- High digitization costs.

- Lack of realistic standards.
- Shortage of skilled personnel.
- Inadequate
- training.

Large institutions adapt more easily; smaller ones struggle without infrastructure or resources.

IV. Digital Culture in Algeria

1. Skills of Information Professionals

Required competencies (Ben Zineb, 2019, p. 436):

- **Technical Skills**:
  - Mastery of digital tools, web publishing, and content creation.
- **Communication Skills**:
  - Digital mediation and awareness-raising about socio-cultural impacts.
- **Creativity & Collective Intelligence**:
  - Collaborative content design and best-practice promotion.

2. Current State

Algeria's e-learning initiatives, though nascent, face hurdles (Hafizi & Mezlah, 2019, p. 190):

- **Limited Internet Penetration**: Low compared to global standards.
- **Low Computer Ownership**: High costs due to taxes/import fees.
- **Monopolized Internet Services**: State-controlled providers limit private sector roles.
- **Credibility Issues**: Lack of government recognition for e-learning certifications. *Despite this, reports (e.g., Oxford Business Group) note Algeria's improving broadband capacity.*

Digital Transformation in Algeria: Key Statistics (2025)

1. **Internet Penetration**:
   - 36.2 million internet users (76.9% of the population), with a 1.4% increase (+488k users) since 2024 212.
   - Median mobile internet speed: **23.42 Mbps** (↑9.6% YoY); fixed broadband: **15.05 Mbps** (↑22.2% YoY) 2.
2. **Mobile Connectivity**:
   - 54.8 million mobile connections (116% of the population), with 91.4% on 3G/4G/5G networks 2.
3. **Social Media**:
   - 25.6 million social media users (54.2% of the population), dominated by Facebook (25.6M) and TikTok (21.1M, +21.2% YoY) 212.
   - YouTube usage declined to 21.1M users (−7.5%) 12.
4. **Digital Gaps**:
   - 23.1% of Algerians remain offline, citing infrastructure gaps or affordability 12.

Algeria's 2030 Digital Transformation Strategy

Adopted in 2025, the strategy aims to position Algeria as a **continental leader in digitization** by 2030. Key pillars and goals include 356:

1. Infrastructure & Sovereignty

- Build **5 national data centers** (e.g., Mohamedia Center: 80% completed) to ensure data sovereignty 6.

- Expand fiber-optic networks and promote the **.dz domain** for national digital identity 611.

2. E-Government & Services

- **100% digitization of public services** (e.g., administrative procedures, payments) 11.
- Ban cash transactions over **500,000 DZD** (~$3,700) to combat the informal economy 11.

3. Digital Economy

- Increase the digital economy's GDP share to **20%** by 2030 6.
- Attract **$1 billion in foreign investments** and support **100,000 tech startups** 11.

4. Human Capital

- Train **500,000 ICT specialists** and reduce brain drain by **40%** 611.

5. Cybersecurity & Governance

- Strengthen legal frameworks (e.g., a new **Digitalization Law**) and cyber defenses 56.

Challenges & Criticisms

- **Slow Progress**: Despite infrastructure investments, Algeria ranks low in global digital indices due to bureaucratic hurdles and uneven regional access 49.
- **Public Skepticism**: Critics highlight gaps between policy announcements and implementation, especially in rural areas 13.

Algeria's 2030 strategy reflects ambitious goals, but success hinges on overcoming technical, regulatory, and societal barriers. The rise in internet use and mobile connectivity signals potential, yet inclusive growth remains critical 913.

Table: Algeria's Digital Transformation Metrics (2025)

Indicator	Value	Source
Internet Users	36.2 million (76.9% of the population)	[DataReportal]
Mobile Connections	54.8 million (116% penetration rate)	[DataReportal]
Social Media Users	25.6 million (54.2% penetration)	[DataReportal]
Median Mobile Speed	23.42 Mbps (+9.6% YoY)	[Speedtest]
Fixed Broadband Speed	15.05 Mbps (+22.2% YoY)	[Speedtest]
Offline Population	23.1% (lack of access/affordability)	[World Bank]
5G Readiness	2 major cities (Algiers, Oran)	[APS News]
E-Government Target	100% digitized services by 2030	[Algerian Gov]

Source: by authors

V. Conclusion

The relentless evolution of science, technology, and information systems demands adaptability. In knowledge economies, **digital culture**—rooted in computer and technological skills—is indispensable. Key findings:

- Digital culture is interdisciplinary and transformative.
- ICT has reshaped global cultural landscapes.
- Critical for individual employability, institutional resilience, and societal progress.
- Globalization necessitates digital adoption to reduce developmental gaps.

Recommendations:

- Institutionalize digital culture across sectors.
- Raise awareness and update legislation.
- Allocate funding for digitization.
- Prioritize training programs.

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