Digitalizing Administration Systems in an Under-Resourced Context: Ministry of Higher Education's E-Readiness

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Abstract: The development of the Administrative System is a significant factor within the National Higher Education Strategic Plan. The Ministry of Higher Education plans to facilitate and expand the registration and recording system of universities. Therefore, the computerization and digitalization of administrations and registrations are considered to cover the above-mentioned goals for Higher Education. Moreover, it is the only way to bring transparency and fast performances. Due to this mentioned fact, and the importance of ICTs and the digitalization of administrations, the author felt the need to study the extent to which the Ministry of Higher Education is ready for digitalizing administration systems. The study entailed the explanation of the existing registration system and its challenges. Furthermore, it discussed the possibilities and facilities that ICTs provide for a country and its administrations. The study concluded with some implications to improve the quality of education and the effective administration system.

Keywords: ICT, Information and Communication Technology, organization, electronic system, Ministry of Higher Education

1. INTRODUCTION

For a government to efficiently and effectively fulfill its responsibilities, the integration of state-of-the-art technologies is imperative. An administration that leverages cutting-edge Information and Communication Technology (ICT) is referred to as an electronic government (e-government). E-government facilitates the dissemination of information and delivery of services to citizens and businesses, embodying both technological advancements and governmental transformations.

This paradigm shift towards e-government not only enhances organizational performance but also streamlines service delivery to citizens. The dissolution of traditional organizational boundaries allows seamless interactions among governmental bodies, citizens, businesses, and non-profit organizations. The e-government framework necessitates a comprehensive overhaul of administrative systems through the incorporation of innovative technologies. Transactions within an electronic government, mirroring contemporary business practices, are exclusively

conducted through electronic communication channels encompassing product exchanges, sales, orders, information access, and correspondence.

Central to the e-government initiative is the optimization of service delivery, inclusive of the eradication of paper-based systems, a vestige of traditional administrative communication methods. Beyond the aforementioned benefits, e-government fosters interconnectedness among diverse governmental units and levels, catalyzing improved communication for overall development and success.

Electronic governance, however, extends beyond administrative functions to encompass political parties, parliamentary activities, governmental powers, judicial functions, and digital access to governmental information and electronic payment systems. Anchored in information technologies such as web-based networks, the internet, and mobile platforms, e-government plays a pivotal role in minimizing corruption and enhancing transparency across all governmental functions.

The fundamental tenet of an electronic government lies in its ability to provide citizens with online access to essential information regarding taxes, registrations, business licenses, and various online services. Administrative transactions between governmental authorities and levels are seamlessly conducted online. The establishment of online relationships between different agencies and organizations, as well as the maintenance of digital connections related to work and performance among employees, further exemplify the transformative impact of e-government initiatives [4].

2. Methodology: This research adopts a meticulous mixed-methods design to explore and evaluate the e-readiness of the Ministry of Higher Education in Afghanistan concerning the digitalization of administration systems. Employing both quantitative and qualitative methodologies, this study aims to provide a nuanced understanding of the current state of readiness and potential challenges and opportunities.

Quantitative Phase: Survey Analysis: The quantitative aspect involves a structured survey distributed to 57 university employees at Herat University, focusing on those engaged in student registration services. A Likert-scale questionnaire captures insights into various factors, including familiarity with computers, infrastructure limitations, internet issues, power outages, legal safeguards, and funding concerns. Statistical tools, specifically SPSS 25, are utilized for robust data analysis, encompassing mean, median, variances, and standard deviation, offering a quantitative foundation for assessing the perceived challenges of digitalization.

Qualitative Phase: In-Depth Interviews and Thematic Analysis: The qualitative dimension of the study involves in-depth interviews with four purposively selected participants, providing rich narratives and insights into the e-readiness landscape.

Thematic analysis is applied to interview transcripts and survey responses to identify overarching patterns, strengths, weaknesses, opportunities, and threats.

Data Integration and Synthesis: The convergence of quantitative and qualitative data allows for a holistic synthesis of findings, providing a comprehensive understanding of Afghanistan's readiness for digital transformation in higher education administration. The integration aims to enrich the analysis, presenting a nuanced and multi-faceted perspective.

Confidentiality and Ethical Considerations: To uphold ethical standards, participant confidentiality and anonymity are prioritized throughout data collection. Informed consent is obtained, assuring participants that personal information will remain undisclosed without explicit permission.

3. Influences of electronic-system on organizations and administrations: The rise of E-government and electronic systems has significantly impacted administrative processes, transforming work systems, procedures, and communication methods at all levels. This shift has streamlined service delivery, allowing administrations to provide faster and more effective services.

Alongside this digitalization, notable changes like E-sharing systems, E-citizens, and E-learning have emerged, forming a comprehensive framework known as E-government. However, the implementation of e-government in developing countries, particularly in Africa, differs significantly from industrialized nations. Cultural and institutional contexts unique to developing countries must be considered before digital transformation can occur.

Donor organizations play a crucial role in supporting developing nations seeking ICT solutions for development. While recognizing the relevance of Information and Communication Technology (ICT), especially e-government, donor organizations view it as a means to alleviate poverty and address administrative challenges. Implementing ICT solutions in developing countries requires a meticulous examination of existing problems and identification of viable opportunities.

Reorganizing public service and participation processes based on ICT, network technologies, databases, and electronic workflows is essential for achieving temporal and spatial independence. The development of e-government hinges on addressing various factors, including administrative preconditions and environmental considerations. Challenges persist, such as limited availability of ICT solutions, administrative culture disparities, and economic constraints, impacting the implementation of electronic systems.

The UN's support in establishing statistics in Sub-Saharan Africa highlights the potential for ICT solutions to enhance financial and tax systems and contribute to overall development. While offering opportunities for improvement, challenges like language diversity, low levels of democratization, and economic development

disparities persist in African countries, affecting the successful implementation of electronic systems. Addressing these challenges is crucial for Sub-Saharan African countries to realize the potential benefits of e-government and pave the way for comprehensive development.

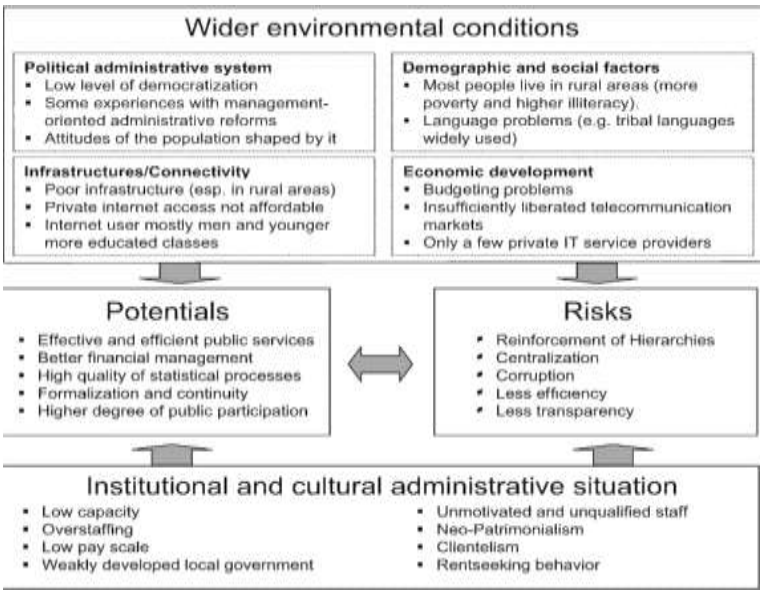


Figure2: E-Government in Africa [6]

The number of internet users and available PCs per 100 inhabitants equals 1.72 and 0.5. To mitigate these access problems, the Ghanaian government is supported by the Indian government. For example, Community Information Centers (CIC) support different sections like libraries, addressing the high level of inequality where there is internet access. [4][6][9].

4. E-Readiness Concept: Information and Communication Technologies (ICTs) play a pivotal role in shaping a country's economic landscape and strengthening government-citizen connectivity, particularly within the administrative sector. Despite the transformative potential of ICT solutions, developing countries encounter challenges in establishing robust infrastructure, often sourced from industrialized nations.

The implementation of ICT solutions in developing countries serves multifaceted purposes, primarily contributing to the enhancement of citizens' quality of life. In the education sector, ICT solutions play a vital role in fostering student development and promoting educational accessibility. Furthermore, these solutions facilitate the dissemination of market-relevant information to farmers, contributing to agricultural advancements. While ICT adoption reduces manual labor in factories, it concurrently generates job opportunities within the ICT sector, serving as a catalyst for overall success and development.

Amidst the discussion of challenges faced by developing nations, the exploration of the concept of e-readiness becomes crucial to assess their preparedness for adopting new ICTs. E-readiness, within the ICT context, encompasses factors such as human

capacities, political leadership, institutional frameworks, supportive policies, regulations, business environment, investment opportunities, and public-private partnerships. It serves as a comprehensive measure to evaluate a country's preparedness to derive optimal benefits from ICTs.

Indices, including the availability of telephone lines, are often employed to measure e-readiness, ensuring the efficiency of electronic systems. This concept extends to assessing the degree to which a community is prepared in the networked world. The evaluation of a country's e-readiness involves a comprehensive analysis of its development and readiness in ICT areas, considering both challenges and opportunities. This evaluative process is instrumental in determining a country's readiness to harness the full potential of ICTs [5] [10].

4.1 E-Readiness Status in Afghanistan: Afghanistan, having endured three decades of war, faces challenges in rebuilding essential infrastructure and basic systems for smooth country operations. The implementation of ICT solutions requires substantial efforts to provide the population with technology-based facilities. E-government, aimed at enhancing government service delivery and information dissemination, is a focal point for Afghanistan's developmental agenda.

This study focuses on e-records readiness, crucial for supporting government services, including pension, birth and death registrations, and tax collection. The e-records tool complements existing e-government readiness tools, offering a high-level assessment of infrastructure and capacity for records and information management. A Central Agency is deemed necessary to support the official records process, requiring specific rules and legal recognition.

The student registration system in Herat province, though reflecting mandated principles, suffers from informal and ad hoc record management. The lack of legislation assigning responsibilities for the creation, management, and preservation of official records necessitates the drafting of appropriate laws by the government. Decision-making processes lack formalization, often falling to system administrators. To address this, a dedicated recording and information management system, coupled with a robust ICT infrastructure and competent staff, is essential for transparency and effectiveness in registrations.

In conclusion, the absence or weakness in recording and information management has led to opaque registrations. Establishing a comprehensive management system supporting retention, destruction, and preservation of digital information is vital. A strong ICT infrastructure, alongside professional ICT staff, forms the foundational platform for successful e-government and e-records programs.

4.2 Research Participants: This study enrolled 57 university employees, specifically those involved in students' registration and related services at Herat University. The participants, comprising 24 females and 33 males, were selected for

convenience by the researcher. These individuals brought diverse administrative experiences to the study, with tenure ranging from 2 to 16 years (refer to Table 1).

Table 1.

Survey Questionnaire Demographic Information

№	Categories	Quantity	Percentage
1	Male	33	57.9
2	Female	24	42.1
		57	100
3	Administrative experiences (1-8 years)	35	61.41
4	Administrative experiences (9-16 years)	22	38.59
		57	100
5	Registrar Offices	26	45.61
6	Service provider offices in Herat University	31	54.39
		57	100

The author employed purposive sampling to select four participants from the aforementioned population for the interview. These four administrative employees are associated with the registrar offices and various units within the Herat University Directorship. The selected participants possess diverse administrative experiences, ranging from 5 to 12 years (refer to Table 2).

Table 2.

The Interview Participants' Demographic Information

№	Participant/Pseudonym	Gender	Administrative Experience	Type of Office
1.	Roya	Female	5 year	Registrar
2.	Ali	Male	6 years	Students' Affairs
3.	Mina	Female	10 years	Registrar
4.	Mohammad	Male	14 years	Students' Affairs

4.3 Data Collection: The qualitative data were gathered through a five-point Likert-scale survey questionnaire, covering various constructs: wider conditions (N=12), potentials (N=7), risks (N=7), and institutional and cultural administrative situations (N=9). The survey demonstrated high internal consistency with a reliability test result of 0.84, as indicated by Cronbach Alpha's value.

The survey, accompanied by an invitation email, was distributed to 57 university employees, and their participation was contingent upon providing consent. The author prioritized confidentiality and anonymity, assuring participants that their personal information would remain undisclosed without explicit permission, and synonyms would be used instead of real names.

For in-depth insights, the author employed purposive sampling, a deliberate selection method based on the participants' specific qualities. Four university employees were selected through this method. The researcher established a comfortable atmosphere during interviews, emphasizing rapport-building to encourage participants to share richer data. The interview protocol covered five components: demographic information, strengths, weaknesses, opportunities, and threats, with each session lasting between 30 to 45 minutes.

4.4 Data Analysis: The quantitative data underwent analysis using SPSS 25 to derive descriptive statistics, encompassing mean, median, variances, and standard deviation. This approach was employed to identify the strengths, weaknesses, opportunities, and threats associated with digitalizing the administrative system and to explore e-readiness.

For the qualitative data, a thematic analysis method was employed, defined as "a method for identifying, analyzing, and reporting patterns within data" [17]. Initially, the researcher transcribed the interviews verbatim, followed by multiple readings to enhance understanding of the data's nature. The researcher made detailed memos and notes to pinpoint key ideas and codes. These codes were consistently compared and cross-examined to generate overarching themes.

To ensure the reliability of the data, the researcher sought validation by having one of their colleagues perform a thematic analysis independently. Subsequently, they engaged in several collaborative discussions, comparing codes and themes until a consensus was reached on the final list of codes and themes.

5. RESULTS

This section encompasses the following themes and subsections: Afghanistan's current e-readiness status, government-wide digital preservation strategy, and SWOT analysis in Afghanistan.

4.1 Qualitative Results

4.1.1 Afghanistan's e-readiness current status

The country's infrastructure, including power supply, is reasonably acceptable, but the Ministry of Communication and Information Technology faces challenges and endeavors to enhance the telecom physical infrastructure for internet technologies. Roya, a research participant, emphasized, "We do not have a stable power supply; the entire country depends on neighboring countries for importing electricity." The Ministry of Communication and Information Technology, a central government agency, is tasked with defining and implementing a government-wide ICT strategy, technology architecture, and action plan. While system administrators and technology staff demonstrate competence in hardware and software use and maintenance, there is currently no government-wide system for securing and backing up the government computer system. Ali highlighted the absence of a universal database and computer system in the Ministry of Higher Education, leading to inefficiencies and significant time wastage in administrative tasks.

To enhance the electronic system's implementation, e-government needs to establish a government-wide standard, defining functional requirements for electronic records management. Although there is currently no government-wide standard for e-records management, formal plans exist to adopt existing standards or develop a national standard. For instance, the Ministry of Communication and Information

Technology aspires to integrate Afghanistan into the global information society and provide advanced information and communication facilities. Mina echoed the absence of government standards for e-records management, facing challenges due to the rapidly changing formats and criteria in the Ministry of Higher Education's system.

The Ministry of Communication and Information Technology aims to increase government efficiency and deliver social services effectively through government-wide e-records. Plans include the development of information and communication technologies curricula. However, the application of these plans is inconsistent. For example, electronic billing services, as noted by Mohammad, are fully functional but often do not work properly. Implementing such services at Herat University could enhance service quality and reduce physical visits by clients to the campus.

4.1.2 Government-wide Digital Preservation Strategy: Preserving e-records and digital information is essential, requiring a comprehensive government-wide strategy to support their long-term preservation. This strategy must anticipate ICT obsolescence and include plans for migrating digital information across generations of technologies. It should also establish controls, procedures, and responsibilities to monitor the accessibility, usability, and authenticity of e-records. Successful digital preservation hinges on professional personnel and adequate funding, emphasizing the need for a national digital preservation plan that collaborates on resources among institutions and government agencies.

In Afghanistan, ongoing discussions among official authorities highlight the importance of current and future access to official records. The Ministry of Communication and Information Technology is actively involved in enhancing the delivery process of social services through ICT, aiming to streamline public service delivery. Plans include the establishment of a national data center and the computerization of all central government entities. As a key government agency, the Ministry addresses issues related to the digital preservation of official records and digital information. The government acknowledges the imperative to protect and preserve digital records [13].

4.2 Quantitative Results

4.2.1 SWOT Analysis in Afghanistan: The graph below illustrates the survey results from 57 employees at Herat University (24 females and 33 males) whose jobs are related to student registration services. The survey aimed to gauge the extent to which various factors pose challenges to the digitization of student registration and relevant services at Herat University. The data indicates that the most critical challenge for the digitization process is the issue of continuous power outages, primarily because Afghanistan's electricity is dependent on neighboring countries.

Question: To what extent can each of the following factors challenge the digitization of students' registration and relevant services at Herat University?

Lack of familiarity of Herat University employees to work with computers

Herat University does not have enough computers

Internet problems

Power outages (dependence of the country's electricity on neighboring countries(

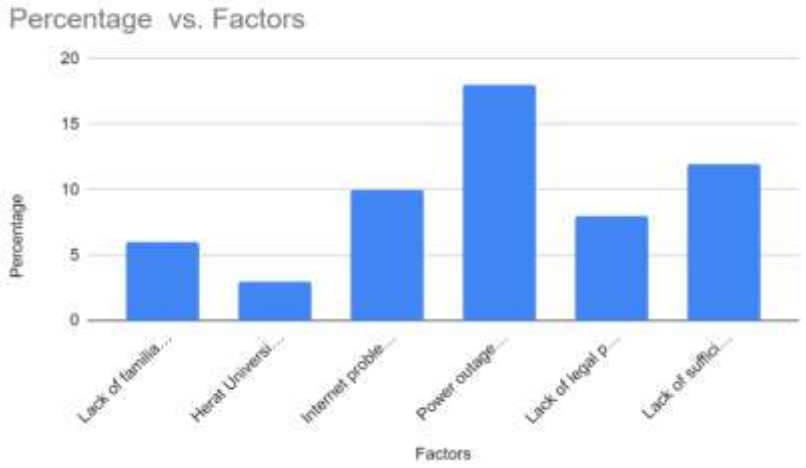
Lack of legal protection of information and communication technology in the country

Lack of sufficient funding from donors to support ICT programs

The bar graph clearly indicates that power outages are perceived as the most significant challenge, highlighting the vulnerability of the digitization process to the country's electricity dependence on neighboring nations. This information is crucial for understanding the key obstacles that need to be addressed to successfully implement and sustain digital initiatives at Herat University.

Results:

Factors	Percentage
Lack of familiarity of Herat University employees to work with computers	6
Herat University does not have enough computers	3
Internet problems	10
Power outages (dependence of the country's electricity on neighboring countries)	18
Lack of legal protection of information and communication technology in the country	8
Lack of sufficient funding from donors to support ICT programs	12



4. 2.1.1 Strengths

Constant Government Support: The Ministry of Communication and Information Technology (MCIT), serving as the government's representative, is committed to transitioning paper-based governmental affairs into a computerized system. This strategic move aims to propel the country towards development and ensure the smooth functioning of administrative processes.

Wide Use of Computers: As part of the government's efforts to modernize administrative practices, there has been a concerted push to equip all Afghan administrations with computers. Presently, computers are integral to the workflow of

various government agencies, contributing to increased efficiency and streamlined processes.

Strong English Skills: Following the establishment of the new government post-Taliban regime, there has been a notable emphasis on enhancing English language proficiency among officials and employees. Through a combination of government-sponsored initiatives and private/local English courses, individuals have undergone training to improve their English skills. This linguistic capacity-building initiative fosters better communication and engagement on the international stage, reflecting the government's commitment to global standards.

4. 2.1.2 Weaknesses

Lack of Professionals in the Computer Field:

Despite the government's provision of computer facilities to various administrations, there remains a significant gap in the skills of employees and staff to effectively utilize these resources for their daily office activities. A shortage of trained professionals in the computer field hampers the seamless integration of ICT into governmental processes, particularly in provincial departments where access to computers is limited.

Inexistence of Law Support: One notable challenge is the absence of comprehensive legislation supporting Information and Communication Technology (ICT) in the country. The lack of a dedicated legal framework contributes to uncertainties and gaps in regulating and safeguarding ICT-related activities, posing hurdles to the optimal functioning of digital systems.

Shortage of Power Supply: The persisting issue of electricity shortages continues to impede progress. Regular electricity failures, coupled with the country's dependence on foreign sources for electricity, contribute to delays in processes. The insufficient local electricity production compounds the challenge, affecting the overall pace of operations across various sectors. Addressing this shortage is crucial for achieving sustained efficiency in administrative processes and the broader development agenda.

4. 2.1.3 Opportunities

Through Effective and Efficient ICT: The implementation of effective and efficient Information and Communication Technology (ICT) leads to the creation of a wide range of employment opportunities.

Creating Close Relations Between Administrations:

ICT enables the establishment of close relations between different administrative units, bridging the distance gap within the government.

Encouraging Business Through ICT:

The utilization of ICT fosters a conducive environment for business growth in the country.

Creating Strong Communication with University Students:

ICT facilitates robust communication channels between administrations and university students, enhancing engagement and information exchange.

Making International Relations and Communications Available:

ICT solutions open avenues for international relations and communications, promoting connectivity on a global scale.

Keeping Officials, Employees, and Students Updated:

The ICT solutions provided in the country ensure that officials, employees, and students stay updated with information technology.

4. 2.1.4 Threats

Insufficient Budgets for ICT Future and Plans:

There is a lack of adequate budgets to support the future and plans of Information and Communication Technology (ICT). Donor funding for ICT projects is inconsistent and not guaranteed to be long-lasting.

Limited Government Capacity to Provide Power Supply:

The government faces challenges in providing universities and government administrations with a reliable and sufficient power supply for their ICT needs.

6. CONCLUSION

The evolution of Information and Communication Technology (ICT) has been gradual, witnessing recent significant advancements that play a pivotal role in the realm of e-governance and governmental development. Developed and industrialized nations extensively leverage ICT, providing their societies with enhanced facilities and opportunities. The utilization of digital information and e-records in these countries has been instrumental in fostering stability and transparency within their governments.

E-governments, operating in an electronic-based system, not only deliver essential services but also stimulate private sector involvement, playing a central role in socio-economic development. However, the journey towards an information society is not without challenges, especially in regions like Afghanistan, which has faced the aftermath of three decades of war, resulting in substantial damage to various sectors. The implementation of e-government, coupled with the widespread use of digital information and e-records, demands a nuanced approach, considering cultural and institutional contexts.

Afghanistan, as a developing country, grapples with a lack of opportunities and heightened risks, necessitating a thorough examination of challenges to identify viable opportunities. The presence of poorly trained personnel further compounds these challenges, underscoring the need for specific programs focused on providing ICT training to personnel.

Despite these challenges, there is optimism that the flawless and effective implementation of Afghanistan’s National Higher Education Strategic Plan could pave the way for success, steering the country towards becoming an information society.

This strategic plan holds the potential to address challenges, empower personnel through training, and position Afghanistan on the path of leveraging ICT for comprehensive development.

6.1. Future Implications

Anticipating the future implications of digitalization in Afghanistan requires careful consideration of key strategic points:

Learn from Global ICT Implementation:

Observing experiences from developing countries that have successfully implemented ICT solutions becomes crucial. Drawing insights from both challenges and successes of industrialized nations can inform Afghanistan's strategy in adopting e-government, e-records, and digital information systems.

Development of Comprehensive ICT Policy and Regulation:

The formulation of a comprehensive ICT policy and regulation framework is essential. This structure will provide vital support for the ICT infrastructure, ensuring alignment with the country's specific needs and standards.

Training for ICT Personnel:

Ensuring adequate training for ICT personnel is paramount for transparent and well-managed service delivery. Equipping personnel involved in ICT solutions with the necessary skills and knowledge is crucial for effective implementation.

Financial Allocation for ICT Infrastructure:

Allocating a specific budget for the development of ICT infrastructure is necessary. A well-funded ICT system forms the foundational platform for the smooth functioning of the country, enabling sustainable digital initiatives.

Implementation of HEMIS System:

Consideration should be given to implementing the Higher Education Management Information System (HEMIS) for comprehensive coverage of student registration across universities nationwide. This centralized system has the potential to streamline processes and enhance overall efficiency.

Effective Plan for Government-wide E-Records:

Developing an effective and robust plan and strategy is imperative for the government-wide implementation of e-records and digital information. This includes establishing mechanisms for usage, maintenance, and long-term preservation of digital records.

Focus on Transparency and Effectiveness in Higher Education:

Emphasizing transparency and effectiveness in the digitalization of higher education is crucial. This focus ensures that higher education standards are maintained, benefiting individuals striving to enter universities through examinations like the University Entrance Exam.

These considerations are designed to guide Afghanistan towards a technologically advanced and transparent future in the realm of digital administration and education.

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