Information and communication technology as a change agent in the university and its role in achieving student satisfaction Sample of students of the Faculty of Economics, Commerce and Management Sciences - University of Sétif 1

تكنولوجيا المعلومات والاتصالات كعامل تغيير في الجامعة ودوره في تحقيق رضا الطالب

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Abstract:

This study aimed to highlight the role of information and communication technology in achieving student satisfaction as one factor of change at the university.

To achieve this goal, a questionnaire was distributed to a sample of students from the Faculty of Economics, Commercial, and Management Sciences, Satif1 University; the study sample consists of 214 students. The study found that the level of students' satisfaction about the availability of ICT (material recources, software, and networks) at the faculty level was average, as well as the level of student satisfaction about the use of ICT in the educational process at the college level was moderate.

Key words: Information and Communication Technology – Change – Student Satisfaction – University.

الملخص:

هدفت هذه الدراسة إلى إبراز دور تكنولوجيا المعلومات والاتصالات في تحقيق رضا الطلبة باعتبارها أحد عوامل التغيير على مستوى الجامعة.

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ولتحقيق هذا الهدف تم توزيع استبيان على عينة من طلبة كلية العلوم الاقتصادية والتجارية وعلوم التسيير جامعة سطيف1 قدرت بـ: 214 طالب، وتوصلت هذه الدراسة إلى أن مستوى رضا أفراد عينة الدراسة عن مدى توفر تكنولوجيا المعلومات والاتصالات (الوسائل المادية، البرمجيات، الشبكات) على مستوى الكلية كان متوسطا، وكذلك مستوى رضا الطلبة حول استخدام تكنولوجيا المعلومات والاتصال في العملية التعليمية على مستوى الكلية كان متوسطا.

الكلمات المفتاحية: تكنولوجيا المعلومات والاتصالات؛ التغيير؛ رضا الطلبة؛ الجامعة.

Introduction:

The world is changing faster than ever because of social and economic factors, which have been significantly impacted by technology, and developments in Information and Communication Technology have impacted all sectors of society, including the education sector.

The use of information and communication technology (ICT) in higher education has become a priority in order to move from traditional education to education to develop knowledge base and provide a flexible learning environment for the quality of educational and research services, and the role of information and communication technology (ICT) in the educational process has emerged since the mid-20th century. It helps teachers to prepare their lectures and offer it to students in a more interesting and interactive way.

Since, Information and communication technology is a useful tool that contributes to changing teaching methods to achieve student satisfaction, Many studies have emphasized the impact of the use of information and communication technology (ICT) on student achievement and increased motivation for learning.

Recently, the use of technology as a tool to develop the higher education has made fundamental changes in educational practices. It contributes to provide both students and teachers with greater opportunities to adapt learning and teaching to individual needs. Consequently, ICT is considered as an important means to

promote new methods of instruction (teaching and learning). It should be used to develop students' skills of cooperation, communication and problem solving. Students are considered the main customers among a number of customers and stakeholders of higher education institutions, and students' satisfaction can be predicted according to **Maimunah, Kaka** and **Finch** (Tarif Sibai, Bay Jr, & dela Rosa, 2021, p. 52) by three factors, namely the performance of trainers, service delivery, and support facilities.

Therefore, information and communication technology has a role in the educational process, especially in helping students to learn effectively and increase their achievement and motivation to learn and develop their abilities in addition to solve problems and enhancing collective learning, as well as the services and facilities granted to them and this increases their satisfaction.

Through this study, we will try to identify the role of information and communication technologies as a change factor in achieving the satisfaction of the Faculty of Economics, Commercial and management sciences of SETIF, by answering the following main question: **what is the role of information and communication technology in achieving the satisfaction of students of the Faculty of Economics, commercial and management sciences at Sétif1 university?**

- What is the level of student satisfaction with the availability of information and communication technology?

To answer this question, we need three sub-questions:

- What is the level of student satisfaction with the availability of material resources at the Faculty level?
- What is the level of student satisfaction with the availability of the software at the Faculty level?

- What is the level of student satisfaction with the availability of networks at the level of the Faculty level?

- What is the level of students' satisfaction with the use of ICT in the educational process at the Faculty?

1- Research Hypothesis

- The level of satisfaction of faculty students with ICT availability was average;

- The level of satisfaction of faculty students about the use of ICT in the educational process was average.

2- Research Objectives

This study aims to achieve the following objectives:

- To highlight the use of information and communication technology as a change agent in the university and its role in achieving the satisfaction of students;

- To identify the satisfaction of students about the information and communication technology available at the Faculty level in terms of material resources, software and networks.

3- Research Importance

The importance of this study stems from the importance of the use of information and communication technology in the educational process, which will enhance the higher education system. It provides an appropriate learning environment that allows change in the process of learning and teaching so that students can deal with knowledge in an effective way. The practical importance of this study also emerges from the use of information and communication technology in the educational process, and this is in order to achieve the satisfaction of students of the Faculty of economics, commercial and Management Sciences Sétif 1.

4- Previous Studies

- Ron Oliver, the role of ICT in higher education for the 21st century: ICT as a change agent for education, https://www.researchgate.net/publication/228920282_The_role_of_ICT_in_higher_education_for_the_21st_century_ICT_as_a_change_agent_for_education .

This study sought to explore the role of ICT in education and, it found that the information and communication technologies (ICT) have influenced educational practice in education and will increase dramatically in the coming years, as information and communication technologies (ICT) have become a powerful factor for change in many educational practices, and the continued use and development of information and communication technologies in education will have a strong impact on what is learned, how it is learned, when and where to learn, who is educated and who is a teacher.

- Areti Valasidou, the impact of ICT's in education: the case of University of Macedonia students, 2008.

The aim of this study is to examine the opinion and the impact of Information and Communication Technology on undergraduate students of the University of Macedonia. The research was conducted for two main purposes, the first purpose was to investigate how familiar are the students of international and political studies are with the use of ICT's on and off campus. The second purpose of the research is to examine the possible relationship between the use of ICT's and the gender and the students' performance (marks) at the "Introduction to Computers" module that is part of their program of studies. The sample of the research was chosen from the undergraduate students in the Department of Political and International Studies at the University of Macedonia. The research sample was consisted of 190 students (the overall number of 1st year students) and a questionnaire was distributed to them in order to complete it. The results

revealed that male students are more favourable toward ICT usage and the students that scored high on the module "Introduction to Computers" were more likely to find that the use of ICT's helps them with their studies in various ways. The university academic and administrative personnel are highly recommended finding ways in order the students to be motivated and maintain positive students' attitudes to use ICT's. Thus, the students will find it very helpful during their studying or even a supplement to other teaching activities.

1- Theoretical frame work

1-1- Definition of the information and communication technology (ICT) Several definitions are provided, including:

Carpenter defines ICT as "The (ICT) are a set of technologies used to process, edit and share information, specifically the scanned data. The birth of ICT is mainly due to the convergence of three activities. Strictly speaking, ICT's are made. (Mokhefi Amina, 2016, pp. 114)

- The telecommunications sector, which includes himself services and equipment;
- The field of information technology including hardware, software and services;
- The audiovisual field that primarily involves the production and audiovisual services, and consumer electronics. " (Mokhefi Amina, 2016, pp. 114-115)

As defined by Herbert Simon that these technologies help to make: "All information available to men in verbal or symbolic form, also in computer-readable form; books and memories are stored in semiconductor memories ..." As information technology and communication can be defined as: "the set of computer and telecommunications technologies, they are the result of a convergence of technologies, they allow the exchange of information, and their

treatments, they also offer new ways ... and methods of communication." (Mokhefi Amina, 2016, p. 114)

Information and communication technology (ICT) by definition is an umbrella term that includes any communication device or application, encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them (Razani, 2012).

The term ICT applied to education, are those technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony that can facilitate not only delivery of instruction, but also learning process itself. These technologies has been identified as an important tool for realizing a new paradigm of learner-centered education that better supports learners' needs through differentiated and personalized instruction. (Khan Shahadat Hossain, 2012, p. 67)

Information and communication technology (ICT) is defined as all types of technology used to transmit and store information in electronic form, including computers, communications, networking, fax machines and other equipment that are heavily used in communications, and it is a set of techniques used to process and share information that provides new methods and communication methods, and is an important tool that facilitates learner-centred learning processes and supports their needs.

1-2- ICT as a Change Agent in Higher Education

As the world moves rapidly to digital media and information, the role of ICT in education has become more important, with information and communication technologies (ICT) working as a powerful agent for changing many educational practices.

The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools, the influence of the technology on supporting how students learn will continue to increase. In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically, these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. (Noor-UL-Amin, 2013)

Information technology changes the concept of traditional method of research work and made the researchers to do more feasibility and reliability studies. With the evolution of ICT researchers can complete their research work in a short period of time and motivates many upcoming researchers to handle more research works. (Alam, 2016, p. 165)

1-3- Role of ICT in Higher Education

Information and communication technology has become an important part in higher education.

Several studies argue that the use of new technologies in the classroom is essential for providing opportunities for students to learn to operate in an information age (Bingimlas, 2009). Today, it is necessary for every teacher in any discipline to be able to prepare and deliver a lecture with the use of ICT because an ICT enhanced lecture is clear, colorful, informative, interactive; moreover, it saves both the teacher's and the student's time, allows the student to work at

their own pace, allows the teacher to work differentially and individually with students, gives the opportunity to monitor and evaluate the learning outcomes (Mykola Nakaznyi, 2015).

According to Bransford et al, ICT can play various roles in learning and teaching processes (Bingimlas, 2009, p. 236), ICT enhances higher education in a number of ways (Khan Shahadat Hossain, 2012, p. 63):

- It enables the effective storing/sorting of information, and can offer new fast ways of communication;
- It enables the reduction of information quantity towards a higher quality and better structure;
- It can be integrated into teaching and learning strategies – and used to support relative learning theories;
- ICT (computers, Inter and Intranet) can be used to create new types of interactive learning media for improved quality, equity, and access in higher education.

Thus, information technology and communication can be used as a tool in the process of education in the following ways (Alam, 2016, p. 163):

- **Informative tool**: It provides vast amount of data in various formats such as audio, video, documents;
- **Situating tool**: It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible;
- **Constructive tool**: To manipulate the data and generate the analysis;
- **Communicative tool:** It can be used to remove communication barriers such as that of space and time.

Information and communication technology (ICT) stimulates students' learning by helping them to gather and analyze information in contrast to

traditional conservation-based teaching methods and information and communication technology-enhanced learning enables students to learn what they need, but faces some obstacles in using this medium in education.

The barriers are categorized as external (first-order) or internal (second-order). First order barriers include lack of equipment, unreliability of equipment, lack of technical support and other resource related issues and second-order barriers include both school-level factors, such as organizational culture and teacher level factors, such as beliefs about teaching and technology and openness to change (Jared Keengwe, 2008).

1-4- Students' Satisfaction

Students are considered the main customers among a number of customers and stakeholders of higher education institutions. Recent trends in higher education sector suggest the importance for higher education institutions to measure quality of services they provide and monitor student satisfaction. According to Oliver, satisfaction may be described as « **the summary of psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience** » and students' satisfaction can be predicted according to Maimunah, Kaka and Finch by three factors, namely performance of trainers, services delivery, and support facilities, what is in accordance with Hill Lomas and MacGregor , who found in research on students' service quality experience that the lecturers and the support system are the most significant predictors of students' satisfaction. (Mestrovic, 2017)

2- Research Design and methodology

2-1- Sampling and data collection tools

The study sample was selected from the students of the Faculty of Economics, Commerce and Management Sciences University of Sétif 1, which is estimated at 214 undergraduate and postgraduate students in all disciplines, and the questionnaire was used as a tool for data collection.

The questionnaire consists of two axes: the first relates to the satisfaction of students with the availability of information and communication technology at the level of the Faculty of Economic, Commercial and management sciences university of Sétif 1 in terms of material resources (5 terms), software (5 terms) and networks (5 terms), The second axis concerns students' satisfaction with the use of information and communication technologies in the educational process at the Faculty (14 terms).

2-2- Statistical tools

The arithmetic mean was used to know the answers to the sample members focused on a particular option, as well as the standard deviation to determine the dispersion of answers, in order to test the hypotheses of the study, a Chi-square test was used, and the statistical Package for Social Sciences (SPSS) version (25) was used to analyze the data.

The triple Likert researcher Scale was adopted to answer the terms of the questionnaire in the following form:

- Give 3 markers to choose to agree;
- Give 2 markers to choose neutral;
- Give 1 mark to choose to disagree.

On this basis, of the study person's trends for each of the axes of the questionnaire will be as follows:

- -From [1-1.66]: a weak level of agreement;
- From [1.67-2.33]: an average level of agreement;
- From [2.34-3]: a high level of agreement.

3- Results and discussion:

Before starting the analysis of the results, we extracted the Cronbach's Alpha coefficient of internal consistency using the statistical program SPSS version 25 and the results were as follows:

The value of Cronbach's Alpha was 0.877 and reflects the internal consistency of the questionnaire items

The research questionnaire and statistical results

Table 01: Students' satisfaction about the availability of information and communication technology at the level of the Faculty (material resources)

Item's number	Item's	mean	standard deviation	agreement's level
01	The faculty library provides you with usable computers	2,4112	0,86076	high
02	The faculty library provides you with a sufficient number of computers	1,7477	0,89959	average
03	the faculty provides you with computers at the level of classroom and amphis for use in lecturing	1,8645	0,92708	average
04	The faculty provides you with projectors at the level of classroom and amphis for use in lecturing (data show)	2,5000	0,77369	high
05	The faculty provides you with loudspeakers at the level of amphis for use in lecturing (haut -parleur)	2,0234	0,93669	average
Total arithmetic means and standard deviation		2,1093	0,53691	average

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

Table 1 shows the results of satisfaction of the members of the study sample about the availability of information and communication technology (ICT), which is the material resources, as the total arithmetic average of: 2.1093 indicating an average level of agreement with a standard deviation of 0.53691, based on the homogeneity of the answers.

Through our review of the results of the previous table, the level of agreement is high for items 1 and 4, as it is estimated (m1=2.4112, m4= 2.5000, and d1= 0.86076, d4= 0.77369). This means that the faculty students are satisfied with the availability of projectors at the level of classroom and amphis for use in lecturing (data show) as well as providing the faculty library for usable computers, while the level of agreement for items 2, 3 and 5 was average, it was estimated (m2=1,7477, m3= 1,8645, m5=2,0234 and d2= 0.89959, d3= 0.92708, d5= 0.93669), This shows that there is an average level of satisfaction of the faculty students with the availability of computers in sufficient number at the level of the faculty library as well as the availability of computers at the level of classroom and amphis for use in lecturing and loudspeakers at the level of amphis for use in lecturing (haut -parleur).

Table 02: Students' satisfaction about the availability of information and communication (software)

Item's number	Item's	mean	standard deviation	agreement's level
01	The faculty library provides you with software to protect your computers (antivirus software)	1,9346	0,88568	average
02	The faculty library provides you with customized programs for the bibliographic search process (book Search, Periodicals...)	2.4579	0.81971	high
03	The faculty provides you with a general computer-level software dedicated to lectures such as: Word, Excel, Power Point	2,4533	0,81371	high
04	The faculty provides you with general software for use at the level of computers in the Internet room such as: Internet browser, Word, Excel, Power Point.	2,2804	0,86447	average
05	The faculty constantly updates the software used at the level of the computers to provide lectures as well as the Internet room	1,8271	0,84087	average
Total average arithmetic means and standard deviation		2,1907	0,55691	average

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

Table 2 shows the results of the satisfaction of the members of the study sample on the availability of information and communication technology (ICT), which is the software, as the total arithmetic average of: 2, 1907 indicating an average level of agreement with a standard deviation of 0.55691 based on the homogeneity of the answers.

Through our review of the results of the previous table, the level of agreement is high for items 2 and 3, as it is estimated (m2=2.4579, m3= 2.4533, and d2= 0.81971, d3= 0.81371). This means that the satisfaction of the faculty students was high on the faculty's offer of dedicated programs for the bibliographic search process (search books, periodicals...) as well as the general software available at the level of the computer dedicated to lectures such as: Word, Excel, PowerPoint. while we see an average level of student satisfaction with the provision of general software for use at the level of computers in the Internet room such as: Internet browser, Word, Excel, PowerPoint as well as providing software to protect computers (antivirus programs) in addition to the updating Continuous software used at the level of computers to provide lectures as well as private Internet room.

Table 03: the satisfaction of students with the availability of information and communication technology at the level of the Faculty of Economic, Commercial and management sciences university of Sétif 1 (networks)

Item's number	Item's	mean	standard deviation	agreement's level
01	allows you to have The faculty library free internet access	2,3037	0,92248	average
02	The faculty library allows you to connect via Wi-Fi If you use your laptop computer.	1,5421	0,83109	weak
03	The automated catalogue of faculty libraries provides you with access to and search of different databases			
03-A	Arabic and foreign books databases	2,5514	0,74094	high
03-B	Databases relating to theses, memos and periodicals	2,5888	0,70482	high
04	The faculty provides you with an intranet that allows you to get information	2,2664	0,87698	average
05	The faculty provides you with a social networking account (Facebook) to connect	1,9579	0,91575	average
Total average arithmetic mean and standard deviation		2,2017	0,47684	average
Total average arithmetic mean and standard deviation (Table 1+ Table 2+ Table 3)		2,1694	0,43735	average

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

Table 3 shows the results of the satisfaction of the members of the study sample on the availability of information and communication technology (ICT), which are the networks, as the total arithmetic average of: 2.2017 indicating an average level of agreement with a standard deviation of 0.47684 based on the homogeneity of the answers.

Through our review of the results of the previous table, the level of agreement is high for items 03-A and 03-B, as it is estimated (m03-A =2.5514, m03-B = 2.5888, and d03-A = 0.74094, d03-B = 0.70482). This means that the satisfaction of the faculty students was high to providing the automated catalogue of faculty libraries provides you with access to and search of different databases

(Databases relating to theses, memos and periodicals, Arabic and foreign books databases). While we see an average level of student satisfaction with providing the faculty library with free internet access, the faculty also provides an intranet to access information, in addition the faculty provides a social networking account (Facebook) to connect .However, the students' satisfaction with the provision of the faculty library for weaving communication services in case of using the laptop computer was weak (m2= 1,5421, d2=0,83109).

Table 04: Faculty students' satisfaction with the use of information and communication technology in the educational process

Item's number	Item's	mean	standard deviation	agreement's level
01	The information and communication technology available at the faculty level facilitates your learning process	2,5280	0,75474	high
02	The information and communication technology available at the faculty level makes it easier to access the information you need	2,3832	0,82388	high
03	The new communication technology available at the faculty level helps you to shorten the time and speed of getting your information.	2,3131	0,85036	average
04	The information and communication technology available at the faculty level increases your interest in lectures	1,9860	0,86388	average
05	The information and communication technology available at the faculty level enhances your level of understanding and interaction	2,1916	0,82549	average
06	The information and communication technology available at the faculty level increases your motivation to learn	2,1963	0,84408	average
07	The faculty's interactive website allows you to put your ideas, opinions and suggestions to update the site	2,2196	0,85217	average
08	The faculty library allows you to use computers to complete your research and thesis	2,4019	0,84320	high
09	The information and communication technology used at the library level makes it easy to make use of the book reservation service quickly	2,1776	0,88613	average
10	The information and communication technology available at the faculty level contributes to broaching all aspects of the courses	2,1729	0,81247	average
11	The use of information and communication technology at the faculty level is better for you than the use of	2,4112	0,78666	high

	traditional methods in the various fields of the educational process (education, understanding, communication...)			
I2	The faculty website makes it easy for you to obtain all the information related to your studies: the cohort, the timing of the study, the timing of the exam, the exam mark, the problem of studying	2,6355	0,69731	high
I3	The Faculty website provides you with useful information related to various events, gatherings, and academic days...	2,5561	0,73423	high
I4	The faculty's interactive website helps you understand lessons by putting lectures and application series into it.	2,2009	0,87843	average
Total average arithmetic mean and standard deviation		2,3124	0,44846	average

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

Table 4: shows the results of Students' satisfaction with the use of information and communication technology in the educational process at the faculty level, as the total arithmetic average of: 2.3214 indicating an average level of agreement with a standard deviation of 0.44846 based on the homogeneity of the answers.

Through our review of the results of the previous table, the level of agreement is high for items 01, 02, 08, 11 ,12, 13. This indicates the satisfaction of the faculty students with the contribution of ICT available at the faculty level in facilitating the educational process as the best means compared to traditional methods, as well as its contribution to obtaining various information related to study and various events and gatherings, and academic days and discussions, in addition to providing computers to complete research and thesis. While we see an average level of Students' satisfaction with the use of information and communication technology in the educational process at the faculty level for items03,04,05,06,07,09,10,14. This means that the level of satisfaction of faculty students about the contribution of ICT to the short time and speed of access to information as well as increasing students' motivation to learn and enhancing the level of understanding was average.

4- Hypotheses testing

To test the hypotheses of this study, one statistical technique, the Chi-Squared Test, will be used to accept or reject the hypothesis, if the calculated X2 value is greater than the scheduled x2 value, we say that x2 is a function that accepts the hypothesis, but if the calculated X2 value is less than the scheduled x2 value we reject the hypothesis.

4-1- The level of satisfaction of faculty students with ICT availability was average;

Table 05: Results of testing the first hypothesis

variables	the calculated X^2 value	the tabulated x^2 value	sig
material resources	83,206	18,307	0.000
software	52,570	18,307	0.000
networks	112,458	21,026	0.000
The axis as a whole	**71,121**	**41,337**	**0.000**

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

From Table 5, the results of the Chi-Square test are all morally indicative at ($\alpha \leq 0.05$), as the calculated Chi-Square value of ICT axis elements (material resources and software and networks) are all greater than the value of the scheduled Chi-Square, and the overall average calculation of this axis was average at 2,1694 and a standard deviation of 0.43735, which confirms the validity of the first hypothesis, which states that: the level of satisfaction of faculty students with ICT availability was average.

4-2- The level of satisfaction of faculty students about the use of ICT in the educational process was average.

Table 06: Results of testing the second hypothesis

variables	the calculated X^2 value	the scheduled x^2 value	sig
The axis as a whole	84,879	37,652	0.000

Reference: The results of the statistical Package for Social Sciences (SPSS) version (25)

From Table 6, we find that the result of the Chi-Square test is a morally indicative at ($\alpha \leq 0.05$), as the calculated Chi-Square value is the focus of faculty students' satisfaction with the use of ICT in The educational process is greater than the value of the scheduled Chi-Square, and the overall arithmetic average of this axis was average at 2,3124 and a standard deviation of 0.44846, which confirms the validity of the second hypothesis, which states that the level of satisfaction of faculty students with the use of ICT in the educational process was average.

Conclusion:

This study examined information and communications technology as one of the factors of change at the university level and the extent of its contribution to achieving students' satisfaction, and the obtained results by analyzing the questionnaire that was directed to a sample of students from the Faculty of Economic, Commercial and Management Sciences at Sétif University 1 showed that the level of satisfaction of the study sample individuals about the availability of technology information and communication, specifically (material resources, software, networks) was average, as well as the level of student satisfaction about the use of information and communication technology in the educational process at the faculty level was average, and this result can be explained by the efforts of the Faculty towards the use of information and communication technology in order to facilitate the process educational to achieve student satisfaction, however,

it suffers from some constrains, so those in charge of the Faculty administration that must remedy these obstacles and strive to improve them in order to achieve student satisfaction.

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