

1-1-2022

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### Recommended Citation

Abu Hilal, Tariq; Abu Hilal, Ala'; and Abu Hilal, Hasan, "Social Networking Applications: A Comparative Analysis for a Collaborative Learning through Google Classroom and Zoom" (2022). *All Works*. 5466. <https://zuscholars.zu.ac.ae/works/5466>

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The 13th International Conference on Emerging Ubiquitous Systems and Pervasive Networks  
(EUSPN 2022)  
October 26-28, 2022, Leuven, Belgium

## Social Networking Applications: A Comparative Analysis for a Collaborative Learning through Google Classroom and Zoom

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### Abstract

Recently, social network applications were developed intensively due to the increasing compaction and user demands. These applications provide different services to their users like learning, awareness, chatting with friends, sharing global news, etc. Simply, this work introduces the advantages of these software applications, specifically in the field of education during the COVID 19 spread. Google Classroom and Zoom meetings had gained the attention of many educational institutes for using them as a learning platform for students and educators. This research used two methodologies SWOT analysis and the information system success model of DeLone and McLean's updated to evaluate the effectiveness of these applications. SWOT analysis was performed for the Zoom meetings and google classroom, then evaluated their effectiveness. Likewise, DeLone and McLean's model was deployed for evaluation, an empirical survey was used and distributed in our college. The results were collected, analyzed, and studied using various statistical parameters. Practically, each application has its pros and cons. However, google classroom showed more functionality for the learning process than the Zoom application.

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Peer-review under responsibility of the Conference Program Chairs

*Keywords:* COVID 19, Google classroom, Zoom, social networking applications and SWOT Analysis ;

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## 1. Introduction

In the past years, educational institutions became familiar with the new types of communication known as social networking. These platforms provide users the services of participating in events and activities, sharing ideas and information, posting videos, photos, comments, and chatting with others. All over the world, millions of people are using these applications and websites. As an estimation, more than 830 million people around the world use these websites. It is a powerful tool for interacting with your family and friends. On another side, that increased the percentage of cybercrimes. The modern age has evolved the whole world into a global village in which social networking applications brought many people closer through an easy way of communication, especially for young adults. All the social networking applications connect people from different areas of the world and have many characteristics in common as all applications are based on web applications, to allow people to share information and interact with each other. With time, the versatility of these applications and their popularity are increasing continuously. There are many models which have been proposed to evaluate the success of the specific Social networking application by focusing on specific functions performed by these applications. Recent studies are focusing on the influence of social networking applications on their ability to improve growth in fields of education, politics, business, and our social life [1].

Social networking applications play important role in the communication of students and teachers for learning purposes through the advancement in technologies. For the social construction of knowledge, information is developed inside a social setting and the information development is typically and consistently communicative. Now a day's students get knowledge using technology that supports contractive knowledge such as knowledge based on multimedia being generated by students, presenting students' thoughts, beliefs, and understanding. Another way of learning is conversing with technology for example arguing, collaborating with others, and discussions among members of groups. Many platforms provide students with learning opportunities such as YouTube videos, online books, and websites that help to solve complex problems [2].

From December 2019 to July 2020 people around the world are going through the pandemic of COVID 19. Due to the health safety of all the people, all the countries around the world preferred lockdown until the situation gets in control still world is going through this serious disease and trying to fight it through precautionary measures. This affected badly the educational system and studies of the student in schools, colleges, and universities. Therefore, the educational system around the world adopted social networking applications as a tool for connecting students with teachers, so they can continue their studies online and not waste time until the reopening of educational institutes. This situation has become challenging for the teachers and students to get used to the online learning sections. Before that teaching was based on the material based on subjects, lectures and contents decided. Students attend their classes in groups in an organized manner and learn through lectures, group assignments, performing experiments, and attending lectures. But during the pandemic administrators introduced the parents, teachers, and students to a way of learning at home. Teachers used different tools and applications to keep in contact with their students such as Google Classroom, zoom meetings, skype, and Microsoft teams [3].

In this paper, we will focus on two widely used social networking applications for teaching and learning google Classroom and Zoom video communication. Google classroom is created by google which is a free website service that focuses on the distribution and grading of assignments for educational institutes. Its basic purpose is to smooth the process of sharing documents between students and teachers. It has been estimated that almost 40 to 100 million people had used google classroom. It can integrate calendars, Gmail, sheets, docs, and slides for better communication between students and teachers. Zoom is a web-based application in which live video broadcast is used by many teachers for delivering their lectures effectively. This meeting event is organized by one host and other participants have equal footing. Similarly, the host of the event can allocate responsibilities of hosting with other participants of the meeting and participants can easily share the display with the meeting participants. During the period of the pandemic, zoom had more than 300 million users [4].

Many studies demonstrated the main points that play important role in the success of any information system. One of them is DeLone and Mclean's model of information system success which become popular in the field of practitioners and academics because it provides a foundation for the research of information systems. On this basis of the information system success model, it is required that there is a need for modification in the social networking applications characteristics.

## 2. Related Work

Over time, the world civilization had been revolutionized due to advancements in technology and communication due to social networking applications, especially since it had been focused on wireless technology. There is a long list of uses of mobile social networking applications which includes access to information and social interactions but the most important issue of the mobile design is the privacy of users due to location sharing through mobile applications. This paper focused on the survey of social networking applications used nowadays and analyzed in detail the privacy policies through control and feedback using the information collected, purposes, accessibility, and construction. Based on our results it is suggested that the available mobile networks need to improve their privacy protection on accessibility and construction. This study also discovers the three misuse of three potential locations and two privacy breaches [5].

Everyday mobiles had been improved with the addition of wearable and portable sensors coupled with mobile processing capabilities due to changes in the environment of users and routine activities. This article describes the UPCASE development in which external and internal sensors are connected through Bluetooth to give user contexts. It is divided into feature extraction using data acquisition from a sensor, publication of background information in web-based servers which supports social networking services that are well known, and interface of context. This methodology uses decision trees for identification and learning of context interface at run time but it can also allow the different interference engine integration middleware. After performing, experiments in real-time its results showed that this approach is promising for providing user context for local mobile applications similarly to network-level applications [6].

This paper is based on the prototype design evaluation and implementation of CeneMe. It is a sensing system which ensures security to its members while sharing their presence with their fellows on social networks. Sensing presence includes the person's status in the form of their disposition (such as sad, normal, and happy), surroundings (such as bright, hot, cold, and noisy), and habits (such as a coffee shop, at work, and the gym). This introduces the sensing presence of users to different social networking applications, for example, Myspace, Skype, and Facebook with implicit communication and a new intensity of connection to the friends on social network platforms. This system is enabled on sensor-enabled and standard number mobile phones. Its services are enabled on the bases of per buddy for the user's exposure to a different degree of sensing a presence. The system services consist of friends feed, social interaction, buddy search, my presence, buddy beacon, and significant places [7].

Versatile semantic Web gives another method of creating setting mindful long-range informal communication applications. Interpersonal interaction applications are changing the method of correspondence by utilizing user-setting data. For instance, miniature publishing content to a blog has become a brilliant method of passing on the current circumstance and action by utilizing the client setting. There is at present a huge distinction between utilizing interpersonal interaction applications on a static PC contrasted with a cell phone, regardless of whether current cell phones are amazing and have great availability. The thing that matters is principally identified with the portability angle since the client settings may change all the more much of the time and the client will be unable to cooperate with the cell phone. In this article, we recognize the basic qualities of current person-to-person communication applications and how they pull in clients. At last, we propose an operator-based framework design that depends on a circulated stage for creating semantic and semi-robotized versatile interpersonal interaction applications [8].

The author of this paper describes the work in progress concerning the use of interpersonal organization data for portable mobile applications. Fundamentally various difficulties are distinguished, for example, how to mine information from different interpersonal networks, how to coordinate and solidify informal networks, and how to oversee semantic data for portable applications. The difficulties are talked about from a semantic Web viewpoint utilizing a driving situation as inspiration. The fundamental target is to empower mobile applications to profit from semantic data got from Web administrations, cell phones, or the general climate. The objective is consequently to make a system that empowers a combination of semantic data (area, action, interests, and so on) with informal network information (from Twitter, LinkedIn, Facebook, and so forth). An extreme objective is to make complex correspondence straightforward through the use of semantic data and informal network information for unavoidable administrations in portable mobile phones [9].

The fast development in utilization and use of Social Networking (SN) stages make them a likely objective by digital hoodlums to lead malevolent exercises, for example, wholesale fraud, theft, illicit exchanging, lewd behavior,

digital following, and digital psychological warfare. Numerous SN stages are stretching out their administrations to cell phones, making them a significant source of proof in cyber cases. In this way, understanding the kinds of likely proof of clients' SN exercises accessible on cell phones is urgent for criminological examination and exploration. In this article, we inspect four famous SN applications: Twitter, Facebook, Google+, and LinkedIn, on IOS and Android stages, to spot any traces of clients' exercises that are of cyber investors' interest. We recognize an assortment of relics (for example passwords, usernames, individual data, login data, transferred posts, traded messages, and posted comments through SN applications) that could encourage a criminal investigation [10].

In numerous nations around the world, as a feature of the outcomes of the COVID-19 pandemic lockdown schools in Germany shut down in March 2020 and just halfway re-opened in May. Educators stood up to the need to adjust to web-based instruction. This paper shows the aftereffects of an overview of early vocation instructors directed in May and June 2020. In the first place, we examined the degree to which they kept in touch with understudies and aced center education difficulties. Second, we dissected likely factors (school PC innovation, educator fitness, for example, their mechanical instructive information, and instructor training learning openings relating to computerized educating and learning). Discoveries from relapse investigations show that data and correspondence innovations (ICT) apparatuses, especially advanced instructor ability and educator training occasions to learn a computerized skill, are instrumental in adjusting to web-based education during COVID-19 school terminations. Suggestions are talked about for the field of educator instruction and the appropriation of ICT by teachers [3].

Long-range informal communication applications (SNAs) are among the quickest developing web uses of late years. In this study, we utilized a causal model to survey the achievement of SNAs, based on DeLone and McLean's refreshed data framework achievement model. Notwithstanding their unique three measurements of value, i.e., framework quality, data quality, and administration quality, we recommend that a fourth measurement – organizing quality – adds to SNA achievement. We experimentally analyzed the proposed research model with a review of 139 Twitter clients. The information approves the critical function of systems administration quality in deciding the central SNA's prosperity. This investigation likewise features the staggering effect of systems administration quality on client fulfillment contrasted with the impact of data quality and administration quality. The hypothetical and reasonable ramifications are discussed [11].

This paper plans to more readily comprehend the encounters of the young and the instructors with the tapping of web-based media like YouTube recordings and the informal communication use of Facebook for educating and learning. This study is keen on appropriating the advantages of utilizing online media and systems administration applications like YouTube and Facebook for learning and academic purposes. To discover the practicality of the employment of YouTube recordings and Facebook postings as instructive and open apparatuses, this paper utilizes a contextual investigation of a subjective technique for casual meetings with tertiary understudies who are examining Business Communication modules from two polytechnics and meetings with instructors who are instructing in Singapore University. The aftereffects of the information demonstrated understudies' inclination to casually learn utilizing the YouTube recordings and Facebook postings with the data and information. Subsequently, the Facebook network and correspondence between the understudies and the instructors empower a decent relationship and in building better affinity between the understudies and teachers. Taking everything into account, the capacity to peruse and compose and study hall associations, instructing, and having up close and personal correspondence is indeed still crucial and significant however it is not, at this point adequate. Old proficiency and old advances are enlarged however not completely supplanted [12].

With the (COVID-19) episode in China, the Chinese government chose to boycott any kind of up close and personal instruction, disturbing classes and coming about in more than 270 million understudies being not able to re-visitation their colleges/schools. In this way, the Ministry of Education (MoE) dispatched an activity of 'Guaranteeing learning undisrupted when classes are disturbed' by changing the whole instructive framework and including the online training part. Nonetheless, this snappy change in this unforeseen basic circumstance of far and wide COVID-19 cases harbors a few difficulties, for example, the absence of time and educator/understudy separation. This paper talks about the chance of utilizing open instructive assets (OER) and open instructive practices (OEP) as compelling instructive answers for beating these difficulties. Especially, this investigation presents a nonexclusive OEP system based on existing open-practice definitions. It at that point presents, in light of this system and dependent on the difficulties revealed by few Chinese instruction pros during two public online classes. At last, this examination presents a few suggestions for the better appropriation of OER and OEP later on. The discoveries of this examination can support

analysts and instructors apply OER and OEP for better learning encounters and results during the COVID-19 outbreak [13].

Appropriately, different measures by the advanced education suppliers have been started to execute social detachment procedures, and internet instruction is followed with fast educational plan change. In any case, because of time limitations, the educational plan change is foreseen to happen quickly without adequate planning. Hence, in this investigation, the idea of the crisis far off instructing (ERT) including its application and assessment is altogether examined. The utilization of the ERT in the Oman Middle East College has been used as a contextual investigation. This examination draws on the CIPP assessment model to evaluate the adequacy of the received model, and subjective information was gathered internet taking irregular examples of understudies and teachers. Plus, meeting and poll reactions, encounters, convictions, and difficulties experienced by the instructors and understudies on the crisis distant educating were utilized and broken down. The gathered data were examined, and dependent on the investigation results, suggestions were sent to fill in as a contribution for future techniques and approaches and to better the presentation of showing learning exercises during comparable circumstances [14].

### 3. Equations DeLone and Mclean's Success Model

This model gives a method for estimating achievement a perplexing ward variable in information success research. The refreshed model proposed in 2003 incorporates six interrelated components of information success achievement: system quality, net benefit, information quality, user satisfaction, service quality, and use [2]. This model gave a plan to arrange too much information on success achievement quantifies and proposed the causal and fleeting interdependencies among the six measurements. Data quality, administration quality, and framework quality ought to be estimated or controlled because independently or together they will influence resulting use and client fulfillment. Use and client satisfaction are firmly interrelated in the proposed model. Positive involvement in use will prompt more noteworthy client happiness. Likewise, expanded client fulfillment will prompt expanded use. Because of utilization and client fulfillment, certain net advantages will take place and will thusly impact and fortify resulting use and client fulfillment. DeLone and McLean's ISSM along these lines joins both cycle and causal connections among the interrelated development. fig.1 presents the updated success model. Table 1 presents the model parameters and their detailed description.

Table 1. DeLone and Mclean Success Model parameters and its description.

Model Parameters	Column A (t)
Networking Quality [1]	A client's apparent central SNA's nature of interpersonal interaction highlights to data trade, distinguish the board, contact the executives, master search, setting mindfulness, and organization mindfulness.
System Quality [2]	A client's apparent central SNA's nature of specialized execution as far as convenience, steadiness, ease of use, and reaction time.
Service quality [2]	A client's apparent central SNA's nature of client care and backing to the degree that comparing directors or client care staff offer help when they guarantee to do, their eagerness to assist, their insight with answering inquiries and their comprehension of clients' particular necessities.
User satisfaction [2]	The degree of fulfilment to the degree that the central SNA meets the client's interpersonal interaction needs, just as a good level on the central SNA's productivity and adequacy.
Use [2]	The utilization of the central SNA to make and stay in contact with companions, just as offer data and information.
Net Benefits [2]	A client's apparent advantages brought by the central SNA in.

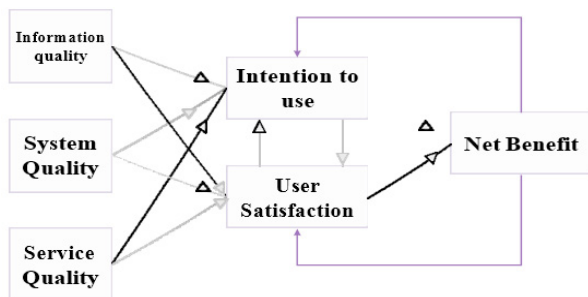


Figure 1. Updated Information Systems Success Model (DeLone and McLean 2003).

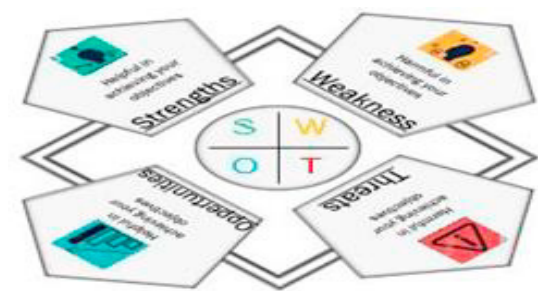


Figure 2. SWOT model for the analysis.

#### 4. SWOT Analysis

SWOT investigation gets its name from the evaluation of the Weaknesses (W), Strengths (S), Threats (T), and Opportunities (O) looked at by industry, area, organization, or any association and considered as a helpful instrument for dynamic. The possibility of SWOT examination has its underlying foundations in key administration research led during the 1960s and 1970s [17]. It brings up the collaboration of both the inward qualities and the more extensive outer setting to augment the positive impacts and limit the negative ones. Fig. 2 shows a diagram of the SWOT model.

#### 5. Methodology

During COVID-19, every field of life had been affected by it and life had been stopped for a while. But the educational institutes used web-based social networking applications for the learning process. One of them mostly used are Google classrooms and Zoom meetings. Our methodology consists of two analyses for these social networking applications. One is the SWOT analysis which looks briefly into the strengths, weaknesses, opportunities, and threats to these applications separately. Second one is DeLone and McLean's information system success model, in which networking quality, service quality, system quality, user satisfaction, and net benefit are used as measuring parameters for both applications. Since there is no such data available that shows the user feedback on them, so we conducted a questionnaire with different universities, schools, and college students and organized the results, and performed DeLone and McLean's model analysis. This research was conducted through a web-based social networking app online because a physical survey cannot be conducted due to precautionary measures of the pandemic.

##### 5.1. Evaluating SWOT Analysis

Google Classroom and Zoom meetings had secured solid positions in the field of online studies in the period of COVID-19. They both have a user-friendly environment for their customers and are easily accessible by a user, but the zoom application had a less quality mobile app which creates problems for the users at some point. Zoom application offers a wide variety of meetings settings for the users which make their work easy and more effective communication between the students and teachers. But on the other hand, google had a more efficient setup of sharing documents, assignments, and grading policy which creates opportunities for the students and teachers to keep track of their files. A detailed summary of the strengths, threats, weaknesses, and opportunities had been shown in Table 2 and Table 3. We can conclude that both applications are offering the best services to their customers but also had some drawbacks which have room for improvement.

Table 2. SWOT Analysis of Google Class Room

Strengths	Weaknesses	Opportunities	Threats
Easy to use and accessible from all devices.	Difficult account management.	Increased opportunities for collaboration.	Phishing and ransomware attacks.
Effective communication and sharing.	Limited integration options.	Keep parents in the loop.	Student Safety and Communications Misuse.
No need for paper.	No automated quizzes and tests.	Manage your students.	Account Takeovers.
Clean and user-friendly interface.	Editing problems.	Google Classroom as accelerator for online learning.	Existing social media sites like Moodle.

Table 3. SWOT Analysis of Zoom

Strengths	Weaknesses	Opportunities	Threats
Access meeting analytics, such as top users by meeting minutes.	Billing service.	Expand international market.	Competitions from Microsoft, Webex, GoToMeeting.
Easily screen-share during a call.	Response time to issues.	The Freemium strategy made customer acquisition simple.	hackers to take over a Zoom user's Mac.
Use the recording feature to save and document your sessions.	Problems with compatibility of plugins all the time.	Zoom's flexible API or software development kit.	Data leakages.
Connection with multiple calendars.	Mobile app for iOS has poor audio quality.	RingCentral and Polycom have integrated with Zoom.	Privacy shortcomings.

## 5.2. Database Analysis

The detailed analysis of Delone and Mclean's success model is implemented using the success parameters which are networking quality, service quality, system quality, user satisfaction, and net benefit. We only focused on the field of education, so the ultimate use of these platforms is to be considered so for learning. Similarly, information quality is not considered because these platforms act as a bridge between the users and do not act as informative websites like Facebook and Twitter. The measures we used in our study were adapted from past validated research, which was modified to get along with our present study. User Satisfaction and System Quality are adapted from the study of management success in [15], Service quality was measured by the study of SERVQUAL instrument in [16]. Networking Quality was adapted by the study of [13]. Descriptive analysis of gathered data is shown in Table 4 for Zoom Application and table 5 for google classroom.

Table 4. The demographic information of ZOOM Questioner Participants

Characteristics		
Gender	Frequency	Percentage
Male	22	57.89473684
Female	16	42.10526316
Age	Frequency	Percentage
13-15	8	21.05263158
16-18	15	39.47368421
19-22	15	39.47368421
Institution	Frequency	Percentage
School	13	34.21052632
College	10	26.31578947
University	15	39.47368421



Table 5. The demographic information of Google Class Room Questioner Participants

<b>Characteristics</b>		
<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	17	68
Female	8	32
<b>Age</b>	<b>Frequency</b>	<b>Percentage</b>
16-18	12	48
19-20	7	28
21-22	6	24
<b>Institution</b>	<b>Frequency</b>	<b>Percentage</b>
College	10	40
University	15	60

For the statistical analysis of both applications, we used the software of Statistical Package for the Social Sciences in which we measured the mean and standard deviation separately for both questionnaire data of Zoom and google classroom. We can observe from table 6 that the inter-item correlation is greater for Google classroom than zoom but the mean of each application is approximately equal to 1.73, detailed analysis of other statistical measures range, variance, the maximum, and minimum value for each application is preened in table 6.

After the detailed analysis of the bot application using the SWOT model and based on the statistical measures, we can conclude that both applications have satisfactory performance measures according to the results. But the Google classroom has more features and functionalities for teachers and students as compared to audio Zoom meeting and video chatting application which has their advantages but lacks the classroom necessary options.

Table 6. Comparison of MEAN, MINIMUM, MAXIMUM, range, and variance of Zoom and Google Classroom.

	<b>Google Classroom</b>			<b>Zoom</b>		
	<b>Item Means</b>	<b>Item Variances</b>	<b>Inter-Item Correlations</b>	<b>Item Means</b>	<b>Item Variances</b>	<b>Inter-Item Correlations</b>
<b>Mean</b>	1.73	0.44	.028	1.72	0.531	0.098
<b>Minimum</b>	1.48	.250	-.540	1.28	0.31	-.383
<b>Maximum</b>	2.32	0.83	.921	2.31	0.708	0.558
<b>Range</b>	0.84	0.58	1.46	1.02	0.389	0.942
<b>Max/Min</b>	1.56	3.33	-1.70	1.79	0.515	-1.45
<b>variance</b>	0.056	0.053	0.06	0.066	0.942	0.035

## 6. Conclusion

This paper is based on the analysis of the social networking application's importance and performance check during the period of COVID 19, which was a challenging time for every country around the world [17], so the educational institutes used different social networking applications as a tool of the learning process of students. The most used applications were studied, Google classroom and Zoom meeting applications in this analysis. Therefore, a short survey was developed and distributed to some college students, then the result was analysed. SWOT analysis was also performed for both applications to include the important points of both applications. There is room for improvement in this research by using more detailed analysis and a larger number of participants [18].

## Appendix A. Measuring parameters

		Agree	Neutral	Disagree
<b>Networking Quality</b>				
NQ 1	You can easily contact with each other using the application without interruption.	A	B	C
NQ 2	You can share / upload and download files from the application easily	A	B	C
NQ 3	You can easily join the meeting and get connected with the class.	A	B	C
NQ 4	You can easily communicate through video or audio to your audience.	A	B	C
<b>System Quality</b>				
SQ 1	You can easily understand how to use the application functions and it is user friendly.	A	B	C
SQ 2	The response time of this application is acceptable.	A	B	C
<b>Service Quality</b>				
Se Q1	The administrator of this application solves the problems in acceptable time	A	B	C
Se Q2	The administrator of this application room understands the customer needs.	A	B	C
Se Q3	The administrator of this application answers your quires or questions satisfactorily.	A	B	C
<b>User Satisfaction</b>				
US 1	This application meets your needs satisfactorily	A	B	C
US 2	You are satisfied with this application efficiency?	A	B	C
<b>Net Benefit</b>				
NB 1	This application helps you to keep going you work (learning) smoothly without loss.	A	B	C
NB 2	You can share your files with less time and less effort?	A	B	C
NB 3	This application improves your (learning skills).	A	B	C

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