



The Use of Wikis within the Virtual Learning Environment to Support Collaborative Working and their Influence on Students' Learning Experience

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ABSTRACT

Wikis are collaborative websites and are increasingly used by organisations for working in groups and sharing knowledge. Furthermore, universities have recently started to implement wikis for teaching and learning purposes. The academic literature suggests that wikis are a suitable tool to enhance constructivist learning environments as well as to develop students' employability skills. Furthermore, wikis can help mitigate some of the common challenges of group work at university.

This paper explores students' experiences with the informal use of wikis that are embedded in the university's virtual learning environment (VLE) and provides suggestions for the implementation of similar wikis in other situations. It is based on data that were gathered in a module for first year undergraduate Festival and Event Management students at a UK University.

Findings suggest some negative experiences with VLE wikis on this module due to the layout of the wiki software, combined with readily available means of online collaboration such as Facebook that students were more familiar with. The findings constitute the basis for advice on using wikis in the future. Most importantly, the wiki software should possess as many of the key characteristics of a wiki as possible. Furthermore, the research confirms several findings from other studies: Students should be given guidance on how they can use and benefit from the wiki and how it is used by the teaching team for monitoring and marking. For high levels of student engagement, a mandatory use of the wiki should be considered, or, alternatively, a thorough embedding of the wiki in the curriculum combined with high levels of staff engagement needs to be in place.

Keywords: wikis; collaboration; group work; employability skills; virtual learning environment

Introduction

According to Bruns and Humphreys (2005, p. 2), tertiary education needs to develop students' abilities "to be creative and generate new knowledge within collaborative networked environments" to prepare them for future employment in today's knowledge-based economy. Furthermore, social constructivist pedagogy argues that students should be involved in the process of knowledge construction and that social interaction can lead to higher levels of understanding (Biggs & Tang, 2011; Fry, Ketteridge, & Marshall, 2009). Thus it can be argued that wikis, which are collaborative websites, might be a suitable tool for enhancing social constructivist learning environments that help to develop important graduate attributes (e.g. Benckendorff, 2009; Wang, 2014; Wheeler, Yeomans, & Wheeler, 2008).

Kai Wah Chu, Siu, Liang, Capio and Wu (2013) argue that there is a lack of research considering the effectiveness of different wiki variants, and to further address this gap this paper explores students' experiences with the informal use of a particular type of wiki. The paper is based on a study that was conducted in a module for first year undergraduate Festival and Event Management students. The coursework for this module is a report produced by groups of three or four students. The students that participated in this research were part of the second cohort asked to use wikis as a means to enhance collaboration during the process of compiling the report, and the first cohort using this particular wiki provider. The wikis used by this cohort were embedded in the University's virtual learning environment (VLE). They were not marked, thus providing significant freedom to students on how to make use of the wikis. Questionnaires were used to evaluate how the use of these particular wikis has influenced students' experience of group work on this module. The paper addresses the question of whether this wiki variant can benefit students' experience of collaborative working and provides useful pointers for implementation of similar wikis in comparable educational contexts. More specifically, the aims of the research were to:

- analyse the impact of informal use of these wikis on the group work process and collaborative working,

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- investigate whether this type of wiki can be as beneficial as a more conventional wiki,
- receive students' feedback on what went well and what could be improved regarding the implementation of these wikis.

Theoretical background

Wikis and their use in higher education

Wikis are collaborative websites and are part of the Web 2.0 technologies (Caple & Bogle, 2013). Web 2.0 refers to various social technologies where users are part of a virtual community with decentralised, equal power among members, so that each member has equal access to create, publish and share digital content (Caple & Bogle, 2013; Judd, Kennedy, & Cropper, 2010).

The most famous example of a wiki is the online encyclopaedia Wikipedia, although wikis can be much smaller with only a few interlinked pages. These pages are collaboratively edited and developed, most of the time through a simple intuitive text editor similar to Microsoft Word without much need for technical knowledge (Benckendorff, 2009; Caple & Bogle, 2013; Guo & Stevens, 2011). All page changes are stored and a history that documents edits and records past versions of a page can be viewed. Most wikis are also versatile in their display of various media, so users can add videos and images (Caple & Bogle, 2013). Overall, wikis offer a greatly flexible space which allows users to structure it according to their needs (Benckendorff, 2009). Furthermore, wikis are accessed online and allow geographically dispersed individuals to edit documents collaboratively (Benckendorff, 2009; Guo & Stevens, 2011). With equal access rights for members, wikis are a highly democratic tool for collaboration (Benckendorff, 2009). Because of their benefits, wikis are becoming increasingly popular in organisations as a tool for collaborative working and sharing of knowledge (Benckendorff, 2009; Elgort, Smith & Toland, 2008).

Although wikis have been around for over a decade, they have only recently been implemented in educational settings (Benckendorff, 2009; Guo & Stevens, 2011). They are particularly useful as a tool for online collaboration that can enhance group projects. By using wikis, students are encouraged to engage with the content and create knowledge collaboratively (Benckendorff, 2009). Consequently, students might experience a stronger sense of responsibility and start to depend less on the teacher (Benckendorff, 2009). Students can thus be encouraged to become active and "take more control over their own learning" (Elgort et al., 2008, p. 198). Generally, one of the main features of a wiki, and in fact most Web 2.0 technologies, is that their aim is to benefit from collective intelligence, instead of just the knowledge of one, thus collaboratively enhancing the quality of the content, which in an educational setting should be beneficial for group work (Caple & Bogle, 2013).

Convenience is another strong argument in favour of wikis. Today's students are mostly highly mobile, yet simultaneously often restricted in time due to part-time jobs, or living a considerable distance from the campus (Benckendorff, 2009). As wikis allow students to contribute when and where it is convenient for them, they are a suitable arrangement for flexible collaboration (Benckendorff, 2009). Furthermore, the current cohort of students is characterised by a high level of online literacy through extensive use of Web 2.0 technologies, and the use of wikis caters to the needs and interests of these students (Benckendorff, 2009).

Wikis allow students to constantly view and review each other's work. This might lead to increased reflection on one's own and others' work and provide additional motivation to write enthusiastically and innovatively (Benckendorff, 2009; Carroll, Diaz, Meiklejohn, Newcomb, & Adkins, 2013). Research conducted by Caple and Bogle (2013) indicates that students might indeed feel that wikis support true collaboration. Likewise, students appreciated that power was spread equally between all group members (Caple & Bogle, 2013).

Despite all the benefits, previous experience of using wikis for group projects in higher education has indicated several common problems (Bruns & Humphreys, 2005; Wheeler et al., 2008): Firstly, some students might be too polite to edit other people's work. Secondly, students may also not want their own work to be changed by others. Additionally, some students might not want others to see their work before they consider it perfect, thus not feeling comfortable with their work in progress being visible to others.

The importance of collaborative working at university

Group work is popular at universities as it is in line with social constructivist theories of learning and is said to develop important transferrable skills. Furthermore, it reduces the number of final products to be assessed, which is an important consideration for staff marking assessment from large cohorts (Biggs & Tang, 2011). However, there are several common challenges associated with group work, both for students and for teachers. A key challenge is social loafing (i.e. the phenomenon when individuals put less effort into group work than into individual pieces of work), which is difficult to detect for teachers, and those students contributing most of the work may develop a cynical attitude towards group work (Benckendorff, 2009). Similarly, students can find marks for group work unfair if it does not reflect individual effort (Flint & Johnson, 2011). Furthermore, students may have different levels of motivation to achieve high marks and as a result dislike working together (Flint & Johnson, 2011).

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While it may save time for teachers, for students group work can be particularly time consuming as commitment is required to come together and work as a team (Caple & Bogle, 2013). Where this is impossible and students are not able to meet, the group task may lead to all group members working in silos, i.e. each member working on assigned parts and combining them at the end without much understanding of the other students' work (Caple & Bogle, 2013). It is thus a challenge for the teacher to ensure that each student understands the entire project and the links between parts instead of only their own contribution (Biggs & Tang, 2011).

For the teacher, the assessment of group work is challenging, as they may be unaware of the individual contributions of each student. The teacher thus has to decide whether individual marks are awarded and, if yes, on which basis, or whether all group members should receive equal marks (Caple & Bogle, 2013).

Nevertheless, there are several arguments in favour of group work in higher education. Benckendorff (2009, p. 102) argues that graduates "need to have attained skills in collaborative and creative teamwork". In fact, most universities state teamwork and collaborative learning as part of their graduate attributes and incorporate them into their course design (Guo & Stevens, 2011). This is particularly important for the events industry, where interpersonal skills are constantly mentioned among the most crucial skills required by professionals (Bowdin, Allen, Harris, McDonnell, & O'Toole, 2011). Further relevant skills that are highly valued are creative problem solving and communication skills (Bowdin et al., 2011).

Being involved in group work at university may enhance the development of these important skills, as it may improve the students' negotiation and conflict resolution skills (Benckendorff, 2009). Caple and Bogle (2013, p. 198) also state that "employers value the leadership skills that graduates may acquire by being involved in a group project". Group tasks help develop generic transferrable skills, such as analytical, cognitive and collaborative skills (Caple & Bogle, 2013). Elgort et al. (2008) also argue that collaboration is an essential skill to learn.

The implementation of group work into the curriculum is not just encouraged externally by the economy but also internally by shifts in thinking about effective teaching and learning (Witney & Smallbone, 2011). Earlier it was mentioned that group work is in line with social constructivist pedagogy. Group work draws on collective cognition, which is "a process whereby two or more people reach insights that neither could have reached alone" (Benckendorff, 2009, p. 104, referring to Lund & Smørdal, 2006). Students involved in effective collaborative work may thus receive insights and construct knowledge they would not have achieved on their own. Guo and Stevens (2011) identify further key benefits of effective collaborative group work at university. They suggested that it can increase students' engagement with the subject and critical thinking and thus enhance learning. Additionally, it can increase social interactions between students which may positively affect their learning experience and lead to increased motivation for participation. In this context, however, it is also important to distinguish between cooperation and collaboration, as the differences are difficult to detect from the process and product of group projects (Witney & Smallbone, 2011).

Using wikis for collaborative working at university

Wikis are increasingly used by organisations (Benckendorff, 2009; Elgort et al., 2008) and as such they provide an authentic setting for assessment and for the development of technical skills desired by potential future employers. Thus, the university can help to provide students with the technical literacy needed for the workplace.

More importantly, however, the use of wikis provides students with the opportunity to develop important transferrable skills and wikis have the potential to enhance students' learning and critical thinking. The effective use of wikis is in line with the social constructivist learning paradigm which states that learners participate in the process of knowledge construction, instead of knowledge being transferred from teacher to students (Benckendorff, 2009; Wang, 2014). Furthermore, wikis allow students to improve teamwork skills and constitute a way to collaborate creatively. Wikis may also help to overcome some of the common challenges of group work. One of the main benefits is that contributions can be tracked in order to avoid social loafing and to allow for perceived fair assessment. This is of advantage to both students and teachers, as students know that free riders will be caught and do not have to waste time chasing after them, while teachers have evidence to fail students or award individual marks (Caple & Bogle, 2013). Furthermore, wikis provide a flexible learning environment that is beneficial for students who experience difficulties in arranging face-to-face meetings due to other commitments, such as part-time work.

However, Judd et al. (2010, p. 342) also emphasise that although "wikis possess a number of features that can facilitate collaboration, it does not necessarily follow that they dictate or impose any meaningful level of collaboration between users". They identify the support students receive for the collaborative use of the wiki as critical. Formal training at the beginning of the module can be helpful (Guo & Stevens, 2011). Similarly, the activity has to be sufficiently integrated with the curriculum and its assessment in order for students to be motivated to engage, where making the use of the wiki mandatory is recommended (Guo & Stevens, 2011; Judd et al., 2010).

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As the theoretical context illustrates, the use of wikis in educational contexts more generally has been researched by various authors, but there is a gap in the literature in terms of the potential benefits of different wiki variants, and there is no research that specifically looks at the characteristics of wikis embedded in virtual learning environments.

Research context

This research was conducted within a first year module for undergraduate Festival and Event Management students. Half of the final module mark was awarded for the production of a group report. The groups consisted of three or four students, and all members were awarded equal marks. To support the group work, students were asked to make use of a wiki. While the wiki itself was not assessed, 20% of the final mark was awarded for collaborative working and the wiki was seen as a means of both facilitating and monitoring this collaborative working. Towards the beginning of the module, students were introduced to the wikis in a seminar taking place in a computer lab. After this session it was up to the students to decide how they would use the wiki. The teaching team had not set up a standard procedure on how to monitor or mark the wikis.

Whereas in the previous year an external provider was used, this year's wikis were embedded in the University's virtual learning environment (VLE) and only featured a limited number of the common wiki characteristics. Due to the way these wikis (from here on called VLE wikis) were set up, students were unable to create pages and links between them. All contributions were thus displayed on one main page, similar to a Microsoft Word document. There were limits to the customisation of this site, although it was possible to add images, hyperlinks and files, and the options to edit text were comparable to Microsoft Word. There was a separate comment section, where all group members could have discussions. As with all wikis, it was possible to view the history of the wiki, including all edits and previous versions.

Data collection and analysis methods

Data collection took place using a questionnaire relating to students' experiences of the wiki which was handed out in the class room a week after the deadline for the report submission. Students participated voluntarily and the required ethical approval was attained from the Institution. Everyone present at the classes was invited to take part in the research; however, due to low attendance numbers in this particular week, only 23 out of 62 students completed the questionnaire, which constitutes the main limitation of this research. The author acknowledges that this low response rate compromises generalisability and that a higher response rate or research across more than one module may have yielded different results. All data gathered for this study were completely anonymous and students were encouraged to give constructive feedback.

- The questionnaire included six Likert-type scale questions (to be found in Table 1) and three open-ended questions as follows:
- The following aspect of using the wiki as part of the assessment worked particularly well and/or was particularly useful.
- The following aspect of using the wiki as part of the assessment did not work well and could be improved in the future.
- Have you used any other tools for online communication within your assessment group (e.g. email, social media or file sharing)? If yes, which ones?

Quantitative data were analysed using percentages, means and standard deviation to get an overview of student perceptions, similar to the approach taken by Benckendorff (2009) in his related study. Qualitative data from the open-ended questions were analysed thematically and provide further insight into students' opinions. The combination of quantitative and qualitative data provides useful information about students' experiences with this wiki variant.

Results

From a teacher's perspective, it can be said that students' engagement with the wiki varied from completely neglecting it following the initial sign up, to regular use of the wiki. Those groups that used the wiki did so in various ways as they were not given specific guidelines as to what was expected of them. For example, some students copied and pasted their finished report into the wiki, whereas others used it on quite a regular basis to upload parts of the coursework and various versions of the final document or as a platform to communicate. Some groups did not use the wiki homepage at all but communicated extensively in the comment section. Most groups that engaged with the wiki on a regular basis used it as a combination for all of the above.

The first part of the questionnaire containing the six Likert-type scale questions revealed relatively few strong tendencies of students towards either satisfaction or dissatisfaction with the wiki; however, the three open-ended questions further illuminate students' perceptions. A summary of the first part of the questionnaire can be found in Table 1.

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Table 1 Student perceptions of the usefulness of the wiki (Note: Mean and standard deviation are based on 5 = Strongly agree and 1 = Strongly disagree)

	Agree	Unsure	Disagree	Mean	Standard Deviation
Q1: I understood how the wiki would form part of the assessment.	16 70%	6 26%	1 4%	3.91	0.85
Q2: The use of the wiki was beneficial to collaboration within our group.	9 39%	3 13%	11 48%	3.00	1.21
Q3: The wiki has made the coursework more complicated than necessary.	9 39%	8 35%	6 26%	3.13	0.97
Q4: The VLE wiki offered enough features to be a useful platform for working on the report as a team.	8 35%	6 26%	9 39%	2.96	1.02
Q5: The transparency of the wiki has motivated us all to contribute equally.	10 43%	4 17%	9 39%	3.00	1.24
Q6: I would consider using a wiki again to support group work in the future.	10 43%	3 13%	10 43%	2.96	1.36

It can be seen that the majority of students understood how the wiki was going to be used for marking the coursework (mean = 3.91); however, there was still a considerable number of students who were unsure. There were more students that did not think the wiki benefitted collaborative working within their group (48%) than students who did (39%) and thought that it made the coursework more complicated than necessary (mean = 3.13). Opinions were relatively evenly spread about whether the specific characteristics of the VLE wiki were sufficiently useful, whether it provided motivation for contributing and whether students would consider using a wiki again. The standard deviation is highest for questions 2, 5 and 6, indicating that there were students who felt strongly about these items (mean \geq 3). The thematic analysis of the qualitative data revealed that there were a variety of perceived potential benefits of using a wiki, but that these were compromised by the characteristics of the VLE wiki software and the widespread usage of other Web 2.0 technologies, making the positive impact of this wiki on collaboration between students questionable. These results will be explained and discussed further in the following section.

Discussion

Perceived benefits of a wiki

Although the experiences with this particular wiki software were not entirely positive, some perceived benefits of using a wiki more generally were identified by students. Students appeared to appreciate the idea behind the wiki and mentioned some of the common advantages associated with wikis as outlined earlier in this paper. One student said that "the idea of the wiki was very good". Students highlighted that it was helpful to have a shared workspace that is easily accessible and allows them to view each other's work, have all information in one place and communicate with the other group members to share ideas. This indicates that students may indeed appreciate being provided with such a shared workspace by teachers.

The specificities of VLE wikis

There were several students that appeared to have had a negative experience with the wiki and strongly emphasised this in the questionnaire. This seemed to be mainly due to the limited user-friendliness of the VLE wikis.

One item that was mentioned repeatedly in the questionnaires concerned difficulties with uploading files. Students said that it was "difficult to find out how to add data" and they were "unable to attach files easily".

Another problematic area concerned the fact that students were not sent or given any notification when the wiki had been edited: "You had to keep checking for when your group mates had posted on it". Another student said: "We weren't given a notification to say that someone had posted on the wiki so we didn't know when the document had been updated". This meant that group members could edit the content without the other students finding out, a shortcoming compared to other types of wikis as well as other means of online communication where contributors are notified of changes.

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As the final product had to be handed in as a hard copy most students completed the final edits in a word processing software. Therefore, another problem that arose was caused by copying between the wiki and Microsoft Word. Students said, for example, that the "document was not exactly displayed how it would be in a Word document and some members of the group had difficulties navigating through the programme, e.g. inserting images and tables" and that "transferring the work from the wiki page to a Word document was also difficult". Re-editing, therefore, resulted in additional work once parts of the coursework had been copied into Microsoft Word.

The appearance of the wiki more generally was also criticised by some students. They perceived it to be difficult to navigate through the wiki and stated that the general layout of the wiki was unclear, and its functions too basic. The format was described to be "complicated and unorganised".

'Competition' with other Web 2.0 technologies

Only two students indicated they had not used any other tool for online communication besides the wiki. Facebook and email were particularly popular and also the file sharing service Dropbox was mentioned a few times. Particularly Facebook groups were repeatedly mentioned as an alternative to the wiki and were described by one student as "the best and easiest way of communicating". These groups can be set up so that only the concerned students have access, and provide a platform for communication as well as sharing files. As Facebook is popular in non-educational settings, students are often very familiar with the use of Facebook groups. This reflects Guo and Stevens' (2011) findings that high familiarity with other Web 2.0 websites negatively influences the perceived usefulness of wikis. Students expect the same or better features from the wiki, otherwise they will return to familiar technologies which they perceive to be more useful.

One student, for example, emphasised that email and social media "were easier to use than the wiki". Similarly, another student said that "it was more useful and helpful meeting with the group or talking using social network sites than using the wiki". Some reasons for using other online tools were mentioned. One student, for example, said that it was easier to add files to both email and Facebook groups and that they were given a notification once someone had uploaded a file. As such, these tools offered students advantages over VLE wikis and were thus preferred and described as "far more beneficial".

VLE wikis and collaboration between students

The results indicate that some students did not perceive the wiki to be beneficial for collaboration, although 43% agreed that the transparency of the wiki provided motivation to contribute to the coursework. Whether wiki use has supported true collaborative working among students, however, is questionable. Due to some of the problems students experienced with the VLE wiki, students perceived other tools for online communication more useful in their approach to work collaboratively, in addition to meeting up face-to-face. One student said that the VLE wiki was "too basic" and that "group meetings were just as effective in collaborating".

Some students even said that the VLE wiki was a hindrance to completing the assessment, and was only used because it was part of the marking criteria. For example, one student explained: "As a group, the wiki was more of a hassle as we felt we had to add to it as we are graded on it, however, it did not aid in the development of our [report]". Another student reported a similar experience: "The only reason our group used the wiki was because we had to". A third student outlined that "after a while [the wiki] just became a hindrance". It was, furthermore, emphasised that "the wiki made the assessment more complicated than it should have been".

Accordingly, these students did not find the wiki particularly useful for the assessment. Consequently, they did not perceive the wiki to be beneficial for collaborative working as they had other preferences for managing teamwork.

It can be seen that some students were indeed aware of some potential benefits of using a wiki for collaborative working, but this research suggests that VLE wikis did not fulfil these potentials.

Conclusions

There were only limited perceived benefits of the introduction of VLE wikis. One important reason for this is the characteristics of the VLE wikis. It is important to note again that these wikis only exhibit a limited number of key features of wikis. As such, they only have limited capabilities to enhance the creative collaboration that wikis are normally associated with. Furthermore, the fact that students were not notified of any edits potentially decreased their interest in engaging with collaboratively enhancing the quality of the content. Some of these challenges may have been overcome with higher levels of engagement with the wikis by teachers as well as more in-depth training of students at the beginning of the module as suggested by Guo and Stevens (2011).

Furthermore, it became clear that students on the module do see the benefits of using a wiki in theory. However, their good online literacy was one major reason why they did not perceive the VLE wikis as particularly useful. Students are familiar with using email

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and Facebook and thus were expecting similar features from the wiki, and these expectations often could not be met, particularly in terms of sharing files and being notified of changes. Similarly, this group of students seemed to have sufficient alternatives for collaboration besides the wiki, i.e. other online tools and face-to-face meetings, and did not seem to be overly dependent on a new way of collaborating online. Interestingly, no major problems with social loafing or similar challenges were reported to the teaching team by this cohort, and the report featured prominently as students' favourite aspect of the module in the standard module evaluation conducted by the Institution. This suggests that this cohort may not have struggled with some of the otherwise common challenges of group work and as such been less receptive to the benefits of a wiki, or that the wiki, imperfect as it was, indeed mitigated against some of the challenges, although this would require further research.

Observations of the VLE wikis showed varying levels of student engagement. Students were not given any guidelines as to how they are expected to use the wiki, and there was no agreement between the teaching team about if and how the use would be monitored and how exactly wikis would be used for marking the coursework. Research by Guo and Stevens (2011) suggests that student engagement with wikis increases when their use is mandatory as well as with high levels of staff engagement. The ongoing use of wikis throughout the module is important for perceived usefulness (Guo & Stevens, 2011). Consequently, the combination of levels of staff engagement, non-mandatory use of the wiki and lack of regular encouragement to use the wiki may have had an impact on the levels of student engagement with the wiki and their perceived usefulness.

Implications for practice

It is crucial that students do not see VLE wikis as a hindrance to completing their coursework, but that they provide an online environment for creative and fruitful collaboration that makes the marking of group work more transparent. In order to achieve this, four main recommendations can be made which apply to similar situations where the implementation of VLE wikis is considered. Firstly, it should be explored whether VLE wikis can be set up so that they resemble 'real' wikis. If not, however, it is advisable to consider an external provider. Secondly, it is recommended that the teaching team provides concrete guidelines as to how students could use the wiki and how they can benefit from it, as well as how it plays a role for marking the coursework. This can be done in an in-depth wiki related seminar and through providing students with written information on the use of the wikis. Thirdly, in order to build on the transparency of the wiki for the marking of group work, it is advisable for the teaching team to agree exactly on how the wikis are used for marking the coursework as well as for potentially monitoring the process of group work. This can then be communicated to students. Finally, in order to stimulate students' engagement with the wikis, the teaching team might want to consider making the use mandatory and embedding it into the marking criteria as well as the curriculum of the module more generally.

Biography

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