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« Opening » a New Kind of High School : The Story of the Open High School of Utah



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Abstract

The use of online learning at the primary and secondary school level is growing exponentially in the United States. Much of this growth is with full-time online schools, most of which are operated by for-profit companies that use proprietary online course content. In this article we trace the development of, and philosophy behind, a full-time online school that uses open access software and open educational resources for course content. As more nations begin to put in place plans for primary and secondary education in the event of natural disasters (e.g., the Christchurch earthquakes) or pandemics (e.g., avian flu or H1N1), the availability of open online content is of critical importance.

Keywords: K-12 online learning; cyber school; virtual school; open education

Introduction

While distance education at the primary and secondary level has been used since the late 1800s in the United States (Moore & Kearsley, 1996), the first fully online school (i.e., Laurel Springs private school) was not introduced until 1991. The first public online school was the Utah Electronic High School, which was first introduced in 1994-95 and offered supplemental or single distance courses to students enrolled in traditional brick-and-mortar schools (although much of its delivery was still correspondence-based) (Clark, 2003). The first fully online public schools (i.e., the Florida Virtual School and Virtual High School Global Consortium) were created in 1996-97 using a state and federal grant, respectively (Clark, 2007). With the introduction of this online or web-based delivery of education, there came a need for the creation of content that took advantage of the online medium.

For most of the past two decades, these online schools have sought to either create their own proprietary online content or to lease the proprietary content of another online school or content provider. In instances where there is more than a single online school operating in a given state, this has created multiple versions of the same course used by different students who could be sitting next to each other in the same computer lab. It was this duplication of resources, along with a philosophical belief that education should be open and accessible, that led to the creation of the first open high school in the United States.

In this article, we will begin by describing the current state of online education within the K-12 environment. Next, we will briefly introduce the open education movement. This will be followed by a detailed discussion of the Open High School of Utah (OHSU), including its history and philosophy, its impact on teachers and students, its procedures for assuring quality, its challenges, and why it was needed, from those individuals who have been closely associated with its development. These individuals include: DeLaina Tonks, who served a one-year term on the OHSU board of directors prior to the school opening and was subsequently hired on as the principal during 2009, the first year of operation; Sarah Weston, who is the curriculum and technology director for OHSU and has built 12 secondary school courses using open educational resources and currently oversees all course development and teacher training on building with OER; and David Wiley, who is the founder of the OHSU. Finally, we conclude with an outline for what an open school, or even open education resources (OER), could mean in other jurisdictions.

Overview of K-12 Online Learning In the United States

A decade ago, Clark (2001) estimated that there were approximately 40,000 to 50,000 student enrolments in online courses in the United States. About a decade later, Wicks (2010) estimated that number to be over 1,500,000 students. In their annual *Keeping*

Pace with K-12 Online Learning publication, Watson, Murin, Vashaw, Gemin, and Rapp (2011) reported significant online learning activity at the K-12 level in all 50 states and the District of Columbia. In 2006, Michigan became the first state in the United States to require that all students complete some form of online learning experience in order to graduate from high school. This has been followed with similar requirements in states like New Mexico, Alabama, and Florida. Finally, Christensen, Horn, and Johnson (2008), in their book *Disrupting Class*, went as far as to predict that in the next decade the majority of K-12 education will be delivered using online learning.

In recent years, the area that has seen the most significant growth within the K-12 online learning field is that of full-time online learning (Watson, Gemin, & Ryan, 2008). Students who are full-time in these online schools are not enrolled in a traditional, physical or brick-and-mortar school, but take all of their classes using the online learning program (usually at home). Greenway and Vanourek (2006) described the experience of one sixth-grade full-time online student:

In a 'typical' day, a student might take mostly core courses with some electives and log on to the computer for an hour or two, clicking through interactive lessons with text, audio or video clips, Flash animation, and links to related sites; completing an online math quiz; emailing the teacher; and 'chatting' with classmates online. Students complete the majority of their work offline in many of these online schools, for example, reading assignments, drafting an essay, conducting an experiment with school-supplied materials, and studying for an exam.... A parent or other responsible adult is asked to supervise—and sometimes to assist with instruction and motivation, all under the direction of a licensed teacher. (§ 17)

In many instances, as students get older the amount of time they spend in front of the computer completing online lessons increases (and the amount of time completing activities offline decreases). In most instances, these full-time online schools are created under charter school legislation in the states where they operate.

Charter schools “are legally independent, innovative, outcome-based, public schools” (North Regional Central Laboratory, 1993, § 1). Essentially they are schools that are based around a charter or contract, which is proposed, negotiated, and agreed to by the school's founders and an authorizing agency (and depending on the state this could be a government agency or some other organization that has that responsibility delegated to it). The charter or contract outlines the specific outcome-based conditions and expectations for this publicly funded school. First introduced in the United States in 1991 in the State of Minnesota, the first full-time online charter school was Choice 2000, created in California in 1994 (Darrow, 2000). At present, 25 states allow for the creation

of full-time online schools under charter school legislation, and that number continues to grow each year (Watson et al., 2010). Over the past decade, for-profit entities have become the dominant force behind the support, authorization, and lobbying for charter schools (Kozol, 2007). The same is true for full-time online charter schools, with most of them being operated by for-profit companies (the largest operator being the publicly traded K12, Inc. [NYSE:LRN]). In these situations, the authorizing organization usually receives an initial administrative fee of 1%-5% of the funding the school receives through the per student full-time equivalent model. The remaining funds are provided to the for-profit operator to run all aspects of the online school (e.g., hiring of teachers and administrative staff, the learning management system [LMS], the online course content, the student information system [SIS], computers and Internet access for the students, state testing requirements, etc.). As these are for-profit companies, the LMS, SIS, and online course content are proprietary in nature, although other schools can purchase the use of those proprietary products.

The Open High School of Utah

OHSU was founded by Dr. David Wiley and approved for charter by the Utah State Office of Education in 2007. OHSU opened its virtual doors in 2009 and completed its inaugural year with 125 9th grade students. Currently the school serves 350 full-time 9-12th grade students and 50 part-time students who take up to two credits online as part of a statewide policy initiative to allow broader access to educational options. Over the next few years, OHSU is poised to offer 9th-12th grade courses to potentially 1,500 students throughout Utah.

A policy commitment to OER was written into the school's charter documents (OHSU, 2009), the contract with the state of Utah under which the school operates:

Open High School of Utah is an online charter high school that is 100% committed to the use of open educational resources (OERs). This approach allows unprecedented levels of individualized instruction with a highly responsive curriculum. (p. 2)

The core philosophy of the Open High School of Utah is that education is a universal human right and that the most effective education is hands-on, service-oriented, and available to anyone. Because of this philosophy, OHSU is committed to using open educational resources – educational materials that can be freely and legally copied, changed, and shared.

Open educational resources enable our educational mission by providing the greatest pedagogical flexibility possible to OHSU students, parents, and teachers. Open educational resources enable our service mission by providing the greatest number of opportunities to improve our communities and revolutionize schooling around the world. (p. 10)

Most explicitly of all, the charter includes an effectiveness goal regarding OER which states, “All courses will be made accessible free of charge on the Internet” (OHSU, 2009, p. 36).

Also, as a matter of policy all course materials produced by the OHSU are licensed under a Creative Commons (CC) Attribution 3.0 License. This does not mean, however, that all the OER used by the OHSU use this specific CC license. OER produced by other individuals or organizations that are embedded in OHSU course materials may be licensed under a different open license, so potential users are notified to confirm the license status of any third-party resources before reusing, revising, or remixing them.

The charter document highlights the pedagogical flexibility of open educational resources. This comment derives from the fact that open licenses remove the copyright restrictions from curriculum materials. Consequently, in an OER context a teacher can give assignments impossible with commercial curriculum like “write a new unit for the history textbook about the Arab Spring” or “create new instructional artwork about the mitosis for our biology book” and then proceed to actually put these assignments directly into the new version of the textbook. More generally, the commitment to open educational resources allows OHSU to engage in ongoing continuous quality improvement, making its curriculum better year after year. This kind of program is impossible with traditional online content leased from a commercial provider.

Conceptually this commitment to openness appears to be a good goal to have in place. The practical application is more difficult to implement, however. On a granular level the challenges become several fold:

- *Awareness*: educating administrators, faculty, parents, and students on the intricacies of when and how to use the Creative Commons licenses
- *Logistics*: creating a repository or streamlined method of cataloging, and distributing OER content once it is Creative Commons licensed; otherwise, multiple filing cabinets and hard drives contain countless licensable lesson plans that never see the light of day
- *Motivation*: cultivating intrinsic motivation for OHSU teachers to share their resources with teachers outside of their department, school, and district, as well as parents, learners, and others around the world

Outside of the OHSU, especially in the virtual setting, much of the curriculum is designed by corporations and delivered part and parcel to the students with little to no input from the teachers. A textbook publisher in Texas is designing curriculum for students in Indiana, and the people closest to their students, the teachers, have very little local ability to customize the curriculum to meet the needs of their learners. That said, in a brick-and-mortar setting, good teachers find or create supplemental content on a regular basis, but are either unaware that they are able to openly license their work (i.e., for those who are allowed to) or do not have a common repository in which to share their work outside of their department.

In Utah, an *Administrative Rule* was recently passed that allows teacher-created materials to be OER (State of Utah, 2009). This is contrary to long-standing traditions of school ownership. Teachers are typically continually told to be very careful with regard to copyright laws, that whatever is produced as a teacher actually belongs to the school since it is created with taxpayer dollars. Teachers are generally allowed to distribute within the department but not throughout the district or even the school. Time will tell if the Utah Administrative Rule has the type of impact we would hope it could have, particularly if educators everywhere followed it.

Why Open Educational Resources?

Education is an elaborate process of sharing: teachers sharing what they know with students through lessons and activities, students sharing their current understanding with teachers through homework and other assignments, teachers sharing feedback on students' current understanding through comments and grades, teachers sharing encouragement and support with students through hallway conversations and lunchtime counseling sessions, and so on. Education *is* sharing.

The primary purpose of copyright is to prohibit individuals and organizations from sharing creative works unless they have procured (frequently expensive) permission. Inasmuch as education is about sharing and copyright is about restricting sharing, education and copyright are fundamentally at odds with one another. Different legal doctrines (like "Fair Use") and legislation (like the *TEACH Act*) try to decrease the enmity between education and copyright, but the tension is fundamental and cannot be adequately addressed with piecemeal or band-aid approaches.

OER are educational materials available for free that come with four important copyright permissions, known as the "4Rs":

1. **Revise:** You have permission to change an OER in any way you need: translate it into Spanish, make an audiobook version, replace the urban examples with examples your rural students will understand, and so on.

2. **Remix:** You have permission to combine an OER with other OER to make new OER.
3. **Reuse:** You have permission to use the original, revised, and remixed OER in any context (e.g., online, in the classroom, etc.).
4. **Redistribute:** You have permission to copy and share the original, revised, or remixed OER with anyone and everyone.

OER are educational materials whose copyright license freely permits copying, revising, remixing, and sharing. In other words, open educational resources are educational materials whose copyright licenses are compatible with the broader goals of education.

Impact Of “Opening” A High School

Implementing an OER curriculum and its results are perhaps the most exciting aspect of the OHSU. Every student’s educational experience can be customized to best fit their needs, turning the one-size-fits-all, teach-to-the-middle education system on its head. For example, at OHSU if a student is struggling with factoring, the teacher creates an additional, personalized screencast highlighting specifically where the student is going wrong, complete with suggestions and examples on how to fix the problem. The online delivery allows the curriculum to perform the majority of the content delivery function, freeing up teacher hours that would have been spent delivering the same lecture over and over to multiple classes to instead work with students in a one-on-one setting, giving them individualized attention just when they need it.

Teacher Ashley Webb shares her thoughts on transitioning to OER: “If something isn’t working for a particular set of students, it’s not like you can rip that chapter out of the textbook and replace it with something else. But with OER curriculum, you can.” The impact of using OER curriculum in a digital environment is ground-breaking to say the least. Teachers have the ability to customize the educational experience for specific groups of students in ways not possible with traditionally copyrighted materials. For example, with a traditionally licensed textbook (whether printed or online), a teacher’s only choices are to use or skip chapters (or smaller units). By contrast, with open educational resources, a teacher can click, edit, and revise the materials directly, writing new examples that speak to her students’ life experiences and placing them directly in the book.

Pedagogically, OER makes it possible to manipulate curriculum to meet student needs in a variety of ways. Special education is an area where OER and technology are critical to the success of our students. Teachers at OHSU have the ability to create MP3 files of OER lessons so that aural learners or students with reading disabilities have an alternate way to receive the information. The use of open resources also makes it possible to very easily modify the curriculum to meet student needs. Some special needs

students read at a third grade level, so the special education teacher reworks the existing higher level curriculum so that her students can understand it better.

The grand experiment of a school based on OER curriculum is showing promising initial results. The percentage of OHSU students deemed proficient by state standardized tests ranged from two to 14 points above the state averages in English, science, and math in both 2010 and 2011. The school has received two Best of State awards, receiving the designation as Utah's best in the Curriculum Development and Charter School categories by beating commercial curriculum providers, local brick-and-mortar schools, and national franchise online schools in the process. The school has also received national recognitions, including two gold medals and a silver medal from the US Distance Learning Association (USDLA) for excellence in computer technology education programming and best practices in distance learning teaching.

Assuring Quality in Open Courses

Because open learning environments empower local teachers and staff so significantly, quality assurance in these environments requires more active involvement by local teachers and staff. This additional commitment takes at least two forms.

First, additional effort is necessary in the initial screening and filtering process. In a traditional textbook adoption or virtual curriculum adoption environment, a publisher's reputation serves as an initial quality check. If past performance is the best predictor of future behavior, then new books or online courses created by publishers who have previously released quality materials are likely worth a closer look. This limited subset of materials can then be subjected to further expert review at the level of adoption. With OER targeted for use in K-12 contexts, few brands exist that signal consistent, high quality. This means that local teachers and staff working for institutions that make policy commitments to openness have a far broader range of material to include in the initial review process.

Second, additional effort is necessary in the ongoing, continuous quality improvement of the curriculum. In a traditional textbook or virtual curriculum environment, local teachers and staff are powerless to effect direct change of the curriculum. Consequently, they spend their time trying to "supplement" their way around holes in the curriculum and directing students around less-relevant parts of the curriculum. The closest path they have to directly effecting change is sending an email to a customer service representative and waiting for the next edition of the material to be published. However, when schools make a commitment to OER, local teachers and staff are immediately empowered to take direct action when they find issues in their curriculum. Redundant or irrelevant parts can be removed, deleted, or rewritten and made relevant before students ever see the materials.

Additionally, because learner interactions with online curriculum generate so much data about learner behaviors, “learning analytics” approaches to working with these data can drive empirical programs of continuous quality improvement. These data provide teachers and staff with specific information about how to exercise their 4R rights to revise, adapt, and improve the materials over time. Teachers are empowered and professionalized by this ability to conduct iterative experiments, tweaking curriculum in real-time in response to rich, real-time data about learner behavior, rather than waiting helplessly for a publisher on the other side of the country to release a new edition of materials in 18 months. Increased local empowerment comes with increased local responsibility and requires additional local effort.

Specific OHSU Quality Assurance Measures

OHSU courses are developed and taught in *Moodle*, the LMS. A combination of LMS and third-party analytic tools provide the school with disclosure of course content efficacy and instructional performance. An essential component of instructional design is the editing and augmentation of course materials and assessments. OHSU places a high priority on using their collected data to determine allocation of school resources for targeted course refinements. Teachers and administrators use the data reports generated by LMS to examine multiple aspects of a course to determine its effectiveness. Reports yield data that aids in analyzing and judging the performance of individual assessment questions. Teachers are able to view the percentage of students selecting each answer, a comparison between highest and lowest quiz takers, and overall difficulty level of each question. This information provides instructors with crucial direction in course assessment edit and design.

The LMS can also show actual student use of the course resources. Instructors can track individual and group use of course activities and assignments. Undervalued resources can then be strategically improved, replaced, or discarded after identifying patterns of student engagement.

Both student and teacher performance are additional benchmarks of course and instructional quality. OHSU uses a third-party tool, Genius SIS, to provide timely performance data. Variables, including student time spent in class, grades, and activity completion, are layered and analyzed to target ‘just-in-time’ student intervention. Genius SIS also aggregates student pacing and grade data at the teacher level, providing a measure of teacher performance. By tracking frequency and type of teacher/student communication, enrollment trends, and completion and drop rates, OHSU can accurately respond, when needed, with appropriate administrative intervention.

OHSU follows a data-driven practice of quality assurance in both courses and instruction, which includes

1. a learning management system (LMS) that collects and houses data;
2. LMS and 3rd party tools leveraged for analytics; and
3. revisions to curriculum and instructional strategies implemented according to reported data.

By leveraging analytics, OHSU exercises targeted refinement of courses and instructional techniques and is able to quantitatively monitor the impact of these revisions on student performance.

Challenges in Credentialing an Open School

Despite the measures of success experienced by the OHSU, there have been some challenges due to the implementation of an OER curriculum, the first being the State Charter Board, the authorizer of the initial charter. Making the commitment to OER the core, foundational commitment of the school's charter protected the school from later misunderstandings by the State. Once the school was chartered with this core commitment, the OHSU was determined to meet the OER commitment as long as the school is operational.

After approving the OHSU's charter, there was some concern that the school would not be using textbooks from a credible corporate provider. Helping the members of the Charter Board to understand the philosophy and rationale behind using OER was a challenge even though doing so was already approved according to charter commitments. Flipping the traditional textbook method and focusing on quality instructional resources gathered online combined with made-from-scratch materials was a foreign concept for most of the members. The OHSU has found that the most effective way to ensure standards alignment (a proxy for quality about which the Board cares deeply) is to use standards as the organizing framework for each course. Teachers can then gather existing OER materials, organize them accordingly, and fill in any gaps with teacher-created materials. As mentioned above, the greatest challenge curriculum writers face is working through the available OER and determining which content to use in order to create a cohesive and effective course.

One last challenge centers around accreditation and assessment. OHSU has a responsibility to protect its assessments and keep them secure so that student performance can be consistently and accurately measured. If the school were to release assessments as part of its curriculum, the results could be disastrous to the accreditation process by compromising test security.

The acquisition of quality assessments also presents challenges of its own. There are very few open source automated assessment tools or question banks that can be implemented into OER curriculum; therefore, OHSU has supplemented what is

available with proprietary question repositories to ensure assessment validity. Now that the initial bottom-up curriculum development phase for grades 9-12 is complete, more resources can be allocated to the development of quality assessments that integrate into the *MoodleRooms* LMS. OHSU can concentrate on a top-down approach to the assessment conundrum and create quality assessments to dovetail with quality curriculum, replacing proprietary materials.

An Open Education Resource Versus an Open School

OHSU is an online charter school whose charter commits it to using OER curriculum. Why would a school make such a commitment? There are several reasons. First, using OER makes sound financial sense over the long-term. During the first three years of operation the school spent significant resources aggregating and standards aligning OER for delivery as meaningful, well-designed online courses. Much of this financial investment was possible because there were no textbooks for the school to buy or other online curriculum to lease. Now that this initial course development is completed, the school's ongoing curriculum expense is the cost of new course creation, ongoing maintenance, and improvements. Contrast this with the cost of using a commercial online curriculum provider like K12, Inc., where ongoing access to course materials (without any teacher support) costs \$30 per month per student (<http://www.k12.com/enroll-or-buy/course-pricing>). As the OHSU grows to enroll 1,000 students, the math would be: 1,000 students x 7 courses per student x 10 months of school x \$30 per course = \$2,100,000 per year to *lease* 10 months of access to course materials. "Lease" is the operative word in the previous sentence because at the end of the 10-month lease the school no longer has any access. Even after accounting for time teachers and staff spend in maintenance and continuous improvement activities each year, OHSU will save millions of dollars each year as it grows to reach its state-approved enrollment cap (i.e., 1,500 students). Moreover, every penny spent on curriculum is invested in the school's teachers rather than transferred to multinational publishers.

Second, "the core philosophy of the OHSU is that education is a universal human right and that the most effective education is hands-on, service-oriented, and available to anyone" (OHSU, 2009, p. 10.). Consequently, OHSU has released its ninth and tenth grade curriculum online as OER, completely free for any individual or school to download and use. The eleventh and twelfth grade curriculum will be released under these same terms in the fall of 2012 and 2013. We believe the free availability of a complete 9-12 online curriculum with an established record of supporting academic achievement will fundamentally change the economics of the K-12 curriculum market in the favor of schools. We also believe there are significant implications for at-risk and underserved populations where financial resources have historically kept students separated from quality curriculum materials.

Third, using OER can have profound quality implications. When teachers are able to make necessary revisions to curriculum directly rather than “supplementing around” problems and directing students around irrelevant material (e.g., “please turn to page 29 and look at the third paragraph”), the instructional impact can be significant. We are currently exploring the shape and nature of this significance in other research.

Fourth, using open educational resources significantly empowers teachers. Gur and Wiley (2007) describe the way in which purchasing commercial curriculum contributes to the deskilling of teachers:

Deskilling is the separation of conception from execution (Apple, 1986, 1995). Deskilling is part of a process in which labor is divided to increase productivity and control labor. Recall that, since the 1950s and 1960s in the U.S., the view that teachers were unsophisticated in skills and major curricular areas forced the creation of “teacher-proof” materials.... In many American classrooms, the pre-packaged curricular materials (“systems,” as they are sometimes called) include everything that a teacher needs, such as curricular content, pre-specified teacher actions/plans and student responses, assessment items, and so forth. Accordingly, teaching skills such as designing teaching and curriculum planning for specific students atrophy because they are really not required (Apple, 1986, 1995). The teaching becomes a matter of something one purchases; the school is transformed into a market.... With their role reduced to manager, teachers see little incentive to improve their pedagogical skills; thus, instruction becomes “a managerial concern, not an educative one both for teachers, and, ultimately, for students. (Shannon, 1989, p. 92)

When a school decides to adopt OER, on the other hand, this policy requires teachers to identify resources, judge their quality, align them to standards, aggregate them in meaningful collections, and choose or design accompanying activities and assessments. Teachers and staff also become involved in ongoing processes of evaluation and continuous quality improvement. Where “teacher-proof” curriculum assumes few or no skills on the part of the local teacher, adopting OER is the ultimate expression of confidence, empowering teachers to bring all their expertise to bear in the classroom.

Conclusions and Implications

Within the United States, K-12 online learning has grown significantly since it was first introduced over two decades ago, and it is continuing to expand at exponential levels as legislatures remove restrictions to both supplemental and full-time online learning. One of the areas where K-12 online learning is still growing the most is the full-time online charter schools, many of which are operated by for-profit corporations. Unfortunately, to date there has been limited evidence of the “success” of these full-time online learning programs, with most of the data indicating that these programs often have severe challenges in meeting students’ needs (Hubbard & Mitchell, 2011; Innovation Ohio, 2011; Joint Legislative Audit Committee, 2010; Miron, Urschel, Yat Aguilar, & Dailey, 2011; Office of the Legislative Auditor, 2011; Ryman & Kossan, 2011). Further, there has been much recent criticism concerning the motives and tactics of the for-profit corporations that operate many of these full-time online programs (Boyd, 2012; Brown, 2012; Fang, 2011; Hood, 2012; Layton & Brown, 2011; Saul, 2011). As we have demonstrated above, using one of these for-profit providers would cost OHSU millions of dollars more per year than the school’s OER strategy does. This would be an indefensible decision given the academic success the school’s OER is helping students achieve.

Jizelle Jurquina, third year OHSU student, validates the use of OER, technology, and quality faculty:

The teachers are one of the factors that have really impacted me – without their expert teacher skills, I would be on the road to destruction. Before I joined OHSU, I was given textbooks for everything; textbooks that were impossible to understand. This made it exceptionally difficult for math. I was barely able to multiply and divide correctly and I couldn’t grasp the idea of fractions when I joined OHSU. It would only be a matter of time before I was held back because of my shaky math knowledge. Mrs. Weston saved me from such doom and taught in such an effective manner. I have learned almost everything that I did not understand the years before, and I am understanding math concepts easily now even after just one or two of her videos. I used to be terrified of math, but I actually enjoy it sometimes, now!

We hope every teacher possesses the skills necessary to successfully use curriculum materials and educational media in support of student learning. However, successfully using OER requires teachers to possess additional information literacies that will enable them to find and evaluate the quality of OER and additional technical skills that will enable them to take full advantage of the 4R permissions granted by open educational

resources. In contexts where teachers lack these additional skills, or where appropriate administrative and policy support is missing, it will be extremely difficult to successfully use open educational resources.

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