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Introduction

The Apereo Foundation was five years old last year. Those five years have seen Apereo grow from a handful of software communities to seventeen, the establishment of a successful incubation process and the development of new partnerships to help deliver our mission. Our sixth year was one of further consolidation, review and open consultation. Early 2018 saw the elaboration and initial implementation of a two-year strategic plan for Apereo. After a period of community consultation culminating at Open Apereo 2018 in Montreal, the Foundation Board began to implement the plan.

The two-year strategic plan was organized around six key themes:

1. Membership and Financial Health
2. Partnerships
3. Communications and Outreach
4. Development Opportunities and Recognition
5. Software Community Health
6. Foundation Services and New Ideas

1. Membership and Financial Health
Apereo is a membership organisation. The resources we gather and focus, whether financial contributions or volunteer effort, are the bricks that we build with. Open source software has had a significant impact on higher education, but that impact is not as great as in some other industries. Advocacy is central, therefore, to developing our membership further. That advocacy tends to naturally fall into three types; advocacy for openness in education, advocacy for open source software – particularly software produced by Apereo software communities – and advocacy for Apereo membership itself. Over the course of the last year, the Foundation Board have worked to refresh the ‘Join Apereo’ section of the Foundation website, and published two key resources on the value of open source software and the value of open source software to education. In the coming period the Foundation Board will be working with other volunteers to add resources to help develop advocacy further.

2. Partnerships
Partnerships are important to Apereo. The Foundation Board continue to explore practical collaboration with other organisations with congruent or overlapping missions. Members of the LAMP consortium of small colleges participate in the Apereo Teaching and Learning Community, and Apereo software communities. Ian Dolphin, the Foundation Executive Director will speak at the forthcoming LAMP Camp in Kentucky in July. The Board continues to explore how the two organisations can more effectively and practically work together to further our respective missions.

The relationship between Apereo and ESUP-Portail, an open-source consortium representing around 80% of French higher education, continues to grow in depth and breadth. Apereo software adoption is growing in France, with significant new pilots of the Karuta ePortfolio system and Shuhari learning analytics stack adding to the established use of uPortal, CAS, and the Open Academic Environment. Representatives of Apereo and ESUP-Portail continue to meet, virtually and face-to-face, four times per year, and Mathilde Guerin sits on the Apereo Foundation Board as a representative of ESUP-Portail. Both organisations maintain close contact with the French Ministry of Higher Education and Research.

Apereo maintains strong informal contact with a number of other organisations among them PESC (the driving force behind our incubating EDexchange Project) and SoLAR (the Society for Learning Analytics Research). Several leading members of SoLAR are involved in our incubating OnTask software community.
3 Communications and Outreach
Early in the year, a working group of board and other volunteers came together to review the Apereo website and establish directions for significantly refreshing the site. The group consulted via the Apereo open list (an index of Apereo mailing lists is available together with details of how to join) and solicited proposals from the community. Work is about to commence on refreshing the site, it will focus on a cleaner look and feel, reducing complexity under the hood, and simplifying navigation and terminology. Accessibility will be improved, and the entire site restructured to emphasize and promote advocacy. The refreshed website will introduce standardized descriptions for our software communities, including some basic software health metrics. Site developers will actively work to more effectively syndicate content from software community websites and other sources.

4 Development opportunities and recognition
Apereo will be reviewing and renewing its recognition programs, the Apereo Teaching and Learning Awards (ATLAS) and Fellows program over the course of 2019-20.

5 Software Community Health
Adopters of open source software often report difficulty making an assessment of the health of the community developing that software. With this in mind, a working group drawn from a number of Apereo software communities established a set of core community health metrics. These are included in the software community section of this report and will be used in the software community descriptions on the reworked Apereo website. We anticipate the metrics being refreshed on a six monthly basis.

6 Foundation Services and New Ideas
Apereo deliberately maintains a minimal number of services, including management of intellectual property and licensing, events support, technical infrastructure, accounting and other community infrastructure. Our intention is not to replicate what is available elsewhere but to provide services that add distinctive value that could not be provided in another way. From time to time, suggestions for new services arise on Apereo mailing lists. A working group drawn from several Apereo software communities established a lightweight formal process by which new services might be suggested, or little used services withdrawn.

Individuals involved in Apereo work across, and influence, a range of organisations. They are involved in standards work such as IMSGlobal Learning Tools Interoperability and Caliper, in the emerging communities around learning analytics, and in a variety of regional and national groups. We promote our software, and our software communities by outreach, face to face events, our own webinars and those of other organisations. Of particular note was last year’s ELI Webinar “Building the Next Generation: Emerging Stories of the NGDLE”. An audience we sometimes don’t reach, but one engaged in developing flexible institutional learning landscapes, learned about Apereo’s capacity to be part of their local solution. Our message to Apereo members, and Apereo member organisations is “let’s make next year the year of engagement and advocacy”. We hope you will spread the word about the great work our community does to benefit education.

Apereo Foundation Board of Directors

Incubation
The Apereo Incubation process is designed to help chart a course from an initial “great idea” towards realization and sustainability. Incubation has two principle elements. It is a structured process (available at http://bit.ly/ApereoIncubation) supported by a group of mentors who provide advice and guidance based on their experience. The time commitment to being a mentor averages two hours
per month. The skill set provided by mentors is diverse. Mentors do not need to have a deep technical background, but experience of technology-related projects is an advantage. Apereo provides training and other opportunities to develop skills. Above all, the mentor must be capable of acting as a critical friend to projects. Mentors do not provide “the answers,” but help to elaborate available alternatives and encourage consideration of alternative paths. From 2019 the Incubation Group will be encouraging incubating software communities to review the Ethical OS Toolkit (https://ethicalos.org/) as they progress through incubation.

The Incubation process is supported by the Incubation Working Group. Working Group members mentor one or more software communities. Current members of the group are:

- Benito Gonzalez (Unicon – Chair)
- Tim Carroll (Rogue Wave Software)
- Dede Hourican (Marist College)
- Lars Keisow (University of Osnabruck)
- Laura McCord (Rice University)
- Sam Lee Pan (University of Cape Town)
- Josh Wargo (Oakland University)
- Nick Woodle (Oakland University)
- Ian Dolphin (Apereo Foundation – ex officio)

If you would like more information about the process, or are interested in becoming a mentor, please write to benito.gonzalez@apereo.org or ian.dolphin@apereo.org.

**Incubating Software Communities**

Apereo currently has seven incubating software communities. Open Assessment (a working name) is the most recent to be admitted (May 2019).

**EDExchange**

EDExchange, a project of the Postsecondary Electronic Standards Council (PESC) Common Data Services (CDS) Task Force of over 30 institutions and vendors, aims to create a secure network for the exchange of transcripts between US educational institutions. The open source, web service based software EDExchange creates has the potential to be utilized to setup secure networks to exchange education data regionally and locally in many countries.

**Fiosan** (Formerly Notifications Backbone)

Fiosan (pronounced Fi-san) aims to transform task-related communications within higher education institutions, through delivering a cross-system solution for personalized notifications and emergency communications, enabling notifications to be created-by and consumed across multiple services and communication channels.

**OnTask**

The OnTask Project aims to improve the academic experience of students through the delivery of timely, personalised and actionable student feedback throughout their participation in a course.

**POET**

POET is a group of people and organizations that believe in the power of open source to innovate and advance their learning and educational solutions. By working together under a single organization, POET’s members can provide additional resources to help advance the open source projects that matter to them.
Shuhari
Shuhari is a set of software components that enables institutions to begin the learning analytics journey on solid learning analytics foundation with low investment and no vendor lock-in.

Tsugi
The goal of Tsugi is to build a scalable multi-tenant “tool” hosting environment based on the emerging IMS standards to help move the industry toward a Next Generation Digital Learning Environment (NGDLE). The use of this framework does not automatically imply any type of IMS certification. Tools and products that use this framework must still go through the formal certification process through IMS (www.imsglobal.org).

Incubation Breaking News – Open Assessment
Open Assessment, a project initially supported by the California Community College Technology Center and Unicon, entered incubation in May 2019. Open Assessment is a stand-alone tests and quizzes engine.
Apereo Foundation Board of Directors 2018-2019

David Ackerman (NYU) – Chair
Lucy Appert (Columbia, then NYU) – Vice Chair
Cheryl Brown (University of Canterbury Christchurch)
Francois Campbell (OpenCollab)
Laura Gekeler (University of Notre Dame)
Mathilde Guerin (ESUP-Portail and Université de la Rochelle)
Jim Helwig (University of Wisconsin-Madison)
Doug Johnson (University of Florida) – Secretary
Shoji Kajita (Kyoto University)
Boeta Pretorius (North West University)
Jeremy Rosenberg (UC Berkeley)
Anne-Marie Scott (University of Edinburgh)

Charlie Leonhardt (Georgetown) – Treasurer, ex-officio
Ian Dolphin – Executive Director, ex-officio

Cheryl, Shoji and Doug retire from the Board in June 2019, with the thanks of the Board and broader Apereo community.
ATLAS Award Winners 2019

About ATLAS

The Apereo Teaching and Learning Awards have a long history of recognizing innovation in teaching and learning. The award grew out of the Teaching With Sakai Innovation Award (TWSIA) which began in 2008 as part of the Sakai community. When Sakai became part of Apereo, the award was expanded to include all Apereo software projects such as Xerte, OAE, Opencast, and Karuta.

The award has a global reputation and has selected winners from disciplines as diverse as healthcare, computer science, liberal arts, education and fashion.

Award Goals

The major goals of the award are to:

- Promote excellent pedagogy and innovation in teaching and learning
- Create a community of educators who want to share teaching and learning practices
- Encourage greater faculty involvement in the Apereo community.

Award entries are evaluated against rubrics and the definition of innovation. Each applicant will submit a description of their innovative teaching method, practice or strategy and indicate the ways in which it addresses the award rubric. The application is divided into three categories: course, project, and portfolio.

Innovation Defined

The ATLAS (formerly TWSIA) committee defines an innovative course or educational experience as one that, by design, engages and challenges students, resulting in greater student interest, a deeper level of understanding and/or a lasting change in the students' perception of an issue or topic.

The innovative method, practice or strategy used may not be new in the world, but its implementation may be out of the ordinary in your field of practice or new to you. It is more than simply using new technologies; rather it is an approach to teaching and learning that results in a much-enhanced, even transformative, educational experience for students.
2019 ATLAS Award Winner
Sébastien Ruffo, Ph.D, O.C.T.
French 306 – Speaking Texts
Oral Second Language at university entails challenges. With Apereo technologies, this course tackles three of those: lack of contact time for students to speak with instructor; difficulty to evaluate live oral speech; rising of second language anxiety. With a partly flipped classroom schedule, students are asked to upload audio and video presentations (tale telling, political speech, mock job interview, voice dubbing, audiobook reading, etc.), to which the instructor can easily provide oral feedback via messaging tool, including audio excerpts from the student’s work. Speech time is much longer, comments are factual, students record at home with less stress.

Honorable Mention
Gaia Cantelli, Ph.D.
Writing in Science & Medicine (Writing 101 – Thompson Writing Program)
Duke University
I teach a writing course that is entirely based around student collaboration. Sakai is essential for me to create a classroom environment where students can freely exchange ideas. The whole class is structured around the Sakai platform, which allows students to interact both with each other and with me to exchange project drafts, feedback and guidance. What’s more, Sakai enables students to continue developing their writing and editing skills outside of class time, providing a flexible format that encourages every one of my students to maximize their potential.
Apereo Fellows 2019

The Apereo Fellows Program recognizes and celebrates the contribution of exemplary members of the broad Apereo community.

Julien Gribonvald, Fellow
Julien works for the online education software service at GIP RECIA - a public interest group serving the Center-Loire Valley (France). He develops, manages, and deploys several services (including uPortal) to more than 200 middle and high schools on a common and centralized platform. Julien is an advocate of open source, so it was natural for him to join the ESUP and Apereo communities. He is a uPortal contributor and his latest contribution is the esco-content-menu, a web component that allows users to customize the uPortal UI without requiring internal changes - that's the power of web components! Julien is also a uPortal Steering Committee member, an ESUP community representative, a coordinator for ESUP contributors, and an organizer of the uPortal Winter Summit in Paris. He enjoys helping generate interest and excitement within open source communities, and will continue to encourage collaboration between the ESUP and Apereo communities.

Greg Logan, Fellow
Greg is a developer, board member, and consultant working with Opencast. He has been involved with the Opencast project for 10 years, initially as a grant-funded junior developer at the University of Saskatchewan, before moving into an independent consultant role. He is the long-term Opencast QA Community manager, maintaining an active presence on IRC, and the Opencast mailing lists as well as leading the weekly technical meetings. He is an active developer working on Opencast, as well as maintaining and building the continuous integration infrastructure. He is a regular presenter at the annual Opencast conference, and is working on organizing Opencast related workshops in North America.

Misagh Moayyed, Fellow
Misagh has been working as a senior software engineer and a member of Unicon’s Identity and Access Management team since 2011. He has been involved with IAM and that of Apereo/JASIG CAS since mid 2009. Since then, Misagh has held a variety of positions within the CAS project, acting as contributor, committer, member of the CAS project management committee as well as the steering committee, project Chairman and release engineer. He has presented and spoken at many Apereo conferences since 2011 and continues to write about CAS in form of Apereo blog posts or promote the project at various IAM conferences around the world.

Martin Ramsay, Fellow
Martin is the Managing Director of the LAMP Consortium (www.lampschools.org), a community of colleges, universities, and other educational organizations that shares a single instance of Sakai. Through collaboration, costs of hosting, support, and training, are driven down. By working together, the LAMP Consortium has grown into a mutually supportive community that genuinely cares about its members’ success. The LAMP Consortium has been operating under Martin’s leadership and using Sakai since April, 2006. In 2008, the Consortium was given the Mellon Award for Technology Collaboration. In making the award, the Mellon committee noted that “LAMP has shown the higher education community that it is possible for institutions having limited resources to install, operate, and sustain even the most sophisticated software, provided that they work together to meet their common challenges.” Martin is also a member of the Karuta Project board. One of the LAMP Consortium schools, New Brunswick School of Theology, is using Karuta and Martin has been involved in helping broker and support the deployment.

Jolie Tingen, Fellow
Jolie is a Product Manager for the Kits platform at Duke University. With over two decades of experience in higher education, her background includes work in instructional design, LMS administration, web development, and user experience design. Jolie is an advocate for all things open in education including open source software and open educational resources. She has been a contributing member of the Sakai community since 2008, participating in the Quality Assurance, User Experience, and ATLAS working groups.

Apereo Fellows Selection Committee

Wilma Hodges
Matt Jones
Stephen Marquard
Janice Smith
Anthony Whyte, chair
Apereo Software Community Reports

Open Academic Environment

**Status:** Graduated incubation

**Background and Objectives**
The Open Academic Environment is a multi-tenant platform aiming to support academic collaboration and networking. Specifically, OAE provides tools and services that can be used in the context of a class, of a formal or informal group outside a class or of such a group outside an institution.

OAE is widely used by staff in French higher education in the context of research and other inter-institutional collaboration. The project is now examining future directions which bring OAE closer to students and to learning.

**Technology/ies**
OAE has a fairly complex technology stack that includes Express / NodeJS, Cassandra, RabbitMQ, Redis, Etherpad, Ethercalc and Elasticsearch. The project development environment requires docker and contributions are submitted via Github.

**Statistics**

<table>
<thead>
<tr>
<th>Date of First Release</th>
<th>Date of Last Release</th>
<th>Number of Releases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>April 2019</td>
<td>70 total (1 in 2018, 3 in 2019 so far)</td>
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<thead>
<tr>
<th>Commits in 2018</th>
<th>Commits in 2019</th>
<th>Frequency of Commits</th>
</tr>
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<tbody>
<tr>
<td>187</td>
<td>114</td>
<td>Daily</td>
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<table>
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<tr>
<th>Contributors in 2018</th>
<th>Contributors in 2019</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

**Number of sites in use (estimated)**

1 (ESUP Portail, France)

**Context**
In 2018 the project went through a period of internal reorganisation as a result of the discontinuation of its commercial instance, Unity. This led to the suspension of the roadmap and team reorientation towards data migration and redeployment. Two new projects emerged from
this effort: a public repository for the data migration project (https://github.com/oaeproject/tenant-migration) and a private one for software provisioning and overall installation and configuration of OAE in an automated fashion.

Still, the OAE team was able to advance significantly on other fronts such as integration of collaborative spreadsheets, reduction of technical debt and the implementation of GDPR-related functionality. This effort is still ongoing and has been the core of the past releases.

Another relevant information to help contextualise the project activity is the fact that the previous team of three people was reduced to just one mid-2018. This lasted until January 2019 when a design intern joined the team to lead the redesigning effort.

2018 Highlights
In 2018 the project mostly dealt with the discontinuation of Unity, the reference implementation and commercial instance of OAE. Initially, the OAE team focused on migrating the important data over to a new OAE instance. In turn, this effort triggered the need for a new continuous delivery mechanism which lasted until 2019.

2019 Highlights
In 2019 the project resumed its normal development rhythm and has been gaining momentum since the latest major release 15.0.0 “Snowy Owl”. This milestone was the result of a consolidation effort focused on reducing technical debt and improving developer ergonomics significantly. Since then, the major highlight has been the integration with Ethercalc to provide collaborative spreadsheets, in a similar fashion to Etherpad.

OAE has also been redesigning its somewhat outdated visual identity with new features and new target audiences in mind.

Future Plans
Future plans include the implementation of the ongoing redesign, the development of new user-facing features and possibly the integration of a third-party office suite.

List and link to repositories and downloads
Backend: https://github.com/oaeproject/Hilary
Frontend: https://github.com/oaeproject/3akai-ux
Bedework Open Source Enterprise Calendar

**Status:** Graduated incubation

**Background and Objectives**
Bedework is an open-source enterprise calendar system that supports public, personal, and group calendaring. It is designed to conform to current calendaring standards with a goal of attaining strong interoperability between other calendaring systems and clients.

Bedework is built with an emphasis on higher education, though it is used by many commercial enterprises. Bedework may be deployed for public events calendaring, personal calendaring and scheduling, or both. Bedework is suitable for embedding in other applications or in portals and has been deployed across a wide range of environments.

From the outset Bedework has been very strongly standards based.

**Technology/ies**
Java, ElasticSearch, RedHat Wildfly, Undertow, XSL, JavaScript, JSP, Struts

**Statistics**

<table>
<thead>
<tr>
<th>Date of First Release</th>
<th>Date of Last Release</th>
<th>Number of Releases</th>
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</thead>
<tbody>
<tr>
<td>March 2006 Bedework 3.0 (July 2002 UWCalendar 1.0)</td>
<td>5/10/2019 - Bedework 3.12.6</td>
<td>&gt; 25</td>
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<tr>
<th>Commits in 2018</th>
<th>Commits in 2019</th>
<th>Frequency of Commits</th>
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<tbody>
<tr>
<td>880</td>
<td>290</td>
<td>more than weekly</td>
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<td>5</td>
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<table>
<thead>
<tr>
<th>Number of sites in use (estimated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 25</td>
</tr>
</tbody>
</table>
Context
Most development over the past four years has been driven by contracts between Universities and Bedework commercial providers.

2018 Bedework Highlights
Replace quickstart build with a downloadable script-based approach. Major performance enhancements. Move to Github (from SVN) completed.

2019 Bedework Highlights
Major rewrite to use ElasticSearch as the sole data store for the read-only client interactions.

Future Plans
Upgrade ElasticSearch.
Repackage to allow different forms of deployment for cloud based services.
Release new Bedework website.

List and link to repositories and downloads
http://bedework.github.io/bedework/#installing-the-quickstart

List Commercial Support
Bedework Commercial Services (bedework.com)
Spherical Cow Group (sphericalcowgroup.com)
Apereo CAS

Status: Graduated

Background and Objectives
Central Authentication Service, more commonly referred to as CAS, is an enterprise multilingual single sign-on solution for the web and a comprehensive platform for authentication and authorization needs. CAS is an open and well-documented authentication protocol. The primary implementation of the protocol is an open-source Java server component by the same name, with support for a plethora of additional authentication protocols and features.

Technology/ies
• Java Development Tookit
• Spring Framework and family
• Apache Tomcat and/or Jetty
• MFA via Duo Security, Google Authenticator, etc
• Data integration with storage technologies such as MongoDB, Redis, etc
• Many more...

Statistics

<table>
<thead>
<tr>
<th>Date of First Release</th>
<th>Date of Last Release</th>
<th>Number of Releases</th>
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<tbody>
<tr>
<td>February 2005</td>
<td>May 2019</td>
<td>193</td>
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<th>Commits in 2019</th>
<th>Frequency of Commits</th>
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<td>2791</td>
<td>849</td>
<td>Daily</td>
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<table>
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<th>Contributors in 2018</th>
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<tr>
<td>74</td>
<td>48</td>
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<table>
<thead>
<tr>
<th>Number of sites in use (estimated)</th>
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</thead>
<tbody>
<tr>
<td>&gt;= 12,000</td>
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</tbody>
</table>

Context
The estimated number of sites in use is calculated by the search engine shodan.io, and only accounts for search findings that could be publicly parsed and indexed by the engine. It does not speak to how active, alive or recent those deployments are. No other statistic exists.

2018 Highlights
Large number of releases to include feature and patch updates, including the major release of CAS 6 with support for Java 11, and over 60 significant improvements such as reCAPTCHA v3, CouchDb, Radius MFA, OAUTH2 UMA, etc as well as brand new UI for CAS administrators.

2019 Highlights
Majority of development has focused on the next feature release, CAS 6.1 due in the summary of 2019 to be followed by the release CAS 6.2 towards the year’s end. So far, there have been 4 release candidates with with a large number of new features around OpenIDConnect, DynamoDb, MFA, Authorization, Redis, Docker, SAML2 and more.

Future Plans
The CAS project generally does not put together a roadmap or plan and grows entirely organically based on efforts of volunteers and contributors around the world. As such, ideas thrown around as interesting and worthy to pursue insofar are:

- Support for FIDO2/WebAuthN
- Compatibility with future Java versions

Repositories and downloads

- [https://github.com/apereo/cas](https://github.com/apereo/cas)
- [https://apereo.github.io/cas](https://apereo.github.io/cas)
- [https://apereo.github.io/](https://apereo.github.io/)
- [https://github.com/apereo/cas-management](https://github.com/apereo/cas-management)
- [https://github.com/apereo/cas-overlay-template](https://github.com/apereo/cas-overlay-template)
- [https://github.com/apereo/java-cas-client](https://github.com/apereo/java-cas-client)
- [https://github.com/apereo/cas-webapp-docker](https://github.com/apereo/cas-webapp-docker)
- [https://github.com/apereo/phpCAS](https://github.com/apereo/phpCAS)
- [https://github.com/apereo/cas-management-overlay](https://github.com/apereo/cas-management-overlay)
- [https://github.com/apereo/mod_auth_cas](https://github.com/apereo/mod_auth_cas)
- [https://github.com/apereo/cas-server-security-filter](https://github.com/apereo/cas-server-security-filter)
- [https://github.com/apereo/inspektir](https://github.com/apereo/inspektir)
- [https://github.com/apereo/spring-webflow-client-repo](https://github.com/apereo/spring-webflow-client-repo)
- [https://github.com/apereo/dotnet-cas-client](https://github.com/apereo/dotnet-cas-client)

Commercial Support

- CAS in the Cloud
- Tirasa
- Unicon, inc
- Cirrus Identity
Status: Graduated Incubation

Background and Objectives
ELMS:LN are a series of efforts in pursuit of greater student and instructor outcomes as a result of investments in Next Generation Digital Learning Environments (NGDLE). ELMS:LN has spawned hundreds of reusable web components in any educational platform as well as its current focus, HAXTheWeb, a serious of instructional content authoring tools that work anywhere.

Technology/ies
Polymer, LitElement, W3C Web component standard, Drupal, WordPress, GravCMS, BackdropCMS, HAXcms (PHP).

Statistics

<table>
<thead>
<tr>
<th>Date of First Release</th>
<th>Date of Last Release</th>
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<tr>
<td>Dec 22, 2015</td>
<td>Jul 12, 2018</td>
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<td>1530</td>
<td>986</td>
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<table>
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<tr>
<th>Contributors in 2018</th>
<th>Contributors in 2019</th>
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<tbody>
<tr>
<td>13</td>
<td>9</td>
</tr>
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</table>

Context
ELMS:LN is a bit hard to measure because it’s a project of projects. Releases we qualify as the ELMS:LN platform itself although in 2019 alone we’ve had over 170 projects (with releases) which are created in pursuit of ELMS:LN. Deployments of ELMS:LN architecture is also separate from the usage of those individual projects. HAXTheWeb would be classified as it’s own project in most other communities but is just one piece of our puzzle. It has its own user base as it’s able to be unplugged from ELMS:LN and has had it’s own release schedule.

2018 Highlights
Released the HAX editor as part of ELMS:LN.
Graduated from Apereo Incubation
2019 Highlights
169 element projects released on webcomponents.org
WCFactory released, a meta-project for managing and scaling web components portfolios
HAXcms has seen multiple releases
HAXiam (SaaS HAXcms) deployed / pilot began

Future Plans
ELMS:LN will continue to work on the WCFactory, HAXeditor, HAXcms, HAXiam as well as enhancing the ELMS:LN core platform through the next year. We have recently converted ELMS:LN to leverage V1 specification web components, providing greater performance and design accuracy across browsers. We continue to gain feedback from instructors, faculty and staff about the needs for HAXeditor as it works to become the default editor in ELMS:LN. We also plan to integrate HAXcms into ELMS:LN in the coming year.

List and link to repositories and downloads
https://haxtheweb.org/
https://www.webcomponents.org/author/elmsln
https://www.elmsln.org/
Karuta Open Source Portfolio

**Status:** Graduated Incubation.

**Background and Objectives**
Karuta is a flexible tool for the incremental prototyping and sharing of digital portfolios (ePortfolios) for various purposes: showcase portfolios, learning portfolios, assessment portfolios.

**Technology/ies**
jQuery javascript (front-end), REST APIs, Java, and MySQL (or Oracle). Responsive design.

**Statistics**

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<tr>
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<table>
<thead>
<tr>
<th>Number of sites in use (estimated)</th>
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<tbody>
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**2018 Karuta Community Highlights**
Version 2.3 of the Karuta Open Source Portfolio includes a full HTML/ZIP export, a bubble map, and improved handling of rubrics.

**2019 Karuta Community Highlights**
Version 2.4 of Karuta OSP will feature enhanced reporting capabilities for large student cohorts. The third quarterly meeting of the Karuta Governing Board was held on April 4, 2019.

**Future Plans**
In 2020 we plan to release version 3.0 with a much richer set of functionalities for fully customizing portfolio presentations.

**Repositories and downloads:**
Go to [https://github.com/karutaproject](https://github.com/karutaproject) to access the following repositories
• karuta-templates
• karuta-backend
• karuta-scripts-utilitaires
• K’IUT
• karuta-frontend
• karuta-report
• karuta-frontend-documentation
• karuta-fileserver
• karuta-iut-templates
• Karuta-Project-Wiki

Commercial Support
ePortfolium (http://eportfolium.com)
Opencast

**Status:** Graduated Incubation

**Background and Objectives**
Opencast is an open source video management system for academic institutions. It covers all stages of the video lifecycle from recording (lecture capture, video ingest) to encoding, publishing, playing, and archiving video assets. It’s scalable from a one-server installation to mass recordings in the cloud and versatile to play with other academic systems (LMS, CMS etc.).

**Technology/ies**
Opencast is an Apache Karaf based OSGI application written in Java providing RESTful interfaces for interaction with front-end components written in JavaScript. The default database used is MariaDB although other RDMS (H2, PostgreSQL, ...) are supported. Apache ActiveMQ is used as an internal message bus and Apache Solr and Elasticsearch are used for caching and full-text search.

**Statistics**

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**Number of sites in use (estimated)**

> 100 approx.

**Context**
Release policy sees two major annual releases plus a handful of smaller (service) releases.

**2018 Opencast Highlights**
- [https://docs.opencast.org/r/5.x/admin/releasenotes/](https://docs.opencast.org/r/5.x/admin/releasenotes/)
- [https://docs.opencast.org/r/6.x/admin/releasenotes/](https://docs.opencast.org/r/6.x/admin/releasenotes/)
2019 Opencast Highlights
  • https://docs.opencast.org/r/7.x/admin/releasenotes/

Future Plans
  • https://opencast.org/roadmap

Links to repositories and downloads
  • https://pkg.opencast.org/
  • https://github.com/opencast/opencast/releases

Commercial Support
  • https://opencast.org/support
openEQUELLA

**Status:** Graduated Incubation

**Background and Objectives**

openEQUELLA is a digital repository that provides a single platform to house teaching/learning, research, media, and library content.

openEQUELLA has been deployed for copyright resource collections; research materials; managing and exposing materials through websites and portals; content authoring; workflow; institutional policy; and organizational resources. openEQUELLA is currently in use in a wide range of schools, universities, colleges, TAFEs, departments of education, government agencies, and corporations worldwide.

Open sourced in 2017, but with over 17 years of history, openEQUELLA is a mature solution written for the Java platform that can enable your educational content to effectively reach your teachers and learners.

**Technology/ies**

Java, Scala, React, Typescript, Purescript, SBT, Gradle

**Statistics**

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**2018 openEQUELLA Highlights**

- Released oEQ 6.6 and oEQ 2018.2.
- Commenced migration to responsive UX with Material UI. The Settings page, Theme Editor, and Manage Courses migrated/created.
- The Scripting API was enhanced for better XML and Control navigation.
- Docker file created for building oEQ, and the oEQ runtime Docker file was enhanced.
- APIs were created for answering GDPR requests.
- Created Report APIs and tutorials.
- Embedded item and attachment view counts in the UX.
- Enhanced the Course Selector.

2019 openEQUELLA Highlights
- Method and process enhancements such as aligning the code copyright statements to Apereo and Apache v2, GitHub branching, moving all repos to the Apereo GitHub organization, and renaming them to reflect the openEQUELLA trademark.
- Automated testing harness was brought into the CI pipeline, and a concerted effort is underway to upgrade the backlevel dependencies.
- The oEQ / Blackboard (Bb) integration via the building block and web service (B2/WS) now works with modern versions of Bb, including SaaS and the Ultra UI.

Future Plans
- Convert application to a responsive, React / Material UI Design application.
- Remove the Java applet and Java Web-Start technologies for end-users.
- Implement a pure oEQ LTI/REST integration with Bb before the B2/WS dependencies in Bb stop working in Q2 2020.
- Enable Cloud Provider integrations.
- Continue to work with adopters on requested features as they emerge.

List and link to repositories and downloads
https://apereo.github.io/openEQUELLA-docs

List Commercial Support
Unicon https://www.unicon.net/
Edalex https://www.edalex.com/

Notes:
git shortlog -s -n --all --no-merges --since="01 Jan 2019" --before="01 Jan 2020"
Sakai

**Status:** Graduated

**Background and Objectives**
Sakai is a freely available, feature-rich, learning management solution built by higher education for higher education, and used by a diverse and global adopter community. Sakai provides a wealth of powerful, flexible tools that enable great teaching, compelling learning, and dynamic collaboration. Thanks to Sakai’s responsive design, instructors and students can achieve their academic goals no matter where they are or what device they use.

Sakai’s breadth of features means you can choose the tools that meet your needs. Out of the box, Sakai includes all of the standard online learning, teaching, and collaboration tools found in modern learning platforms. In addition, Sakai has a wide range of community contributed tools and external integrations available as add-on components. Sakai’s open source flexibility allows you to configure or customize the system as much or as little as needed.

**Technology/ies**
github.com/AlDanial/cloc v 1.80  T=10.91 s (1008.7 files/s, 193900.6 lines/s)

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**Number of sites in use (estimated)** 300

### Context

Each year, Sakai typically has between 1000 and 2000 commits from over 40 developers updating its 1.4-million-line code base.

Sakai has approximately 300 institutional adopters worldwide - the exact number of institutions using Sakai is unknown, since Sakai is free to download without registration and has no mechanism to “call home” to let us know it is being used.
2018 Sakai Highlights
SakaiCamp strategic planning retreat held in Orlando, FL on January 22-24, 2018

The Sakai Manifesto was drafted at SakaiCamp 2018.

Sakai 12.0 - release date 21 March, 2018, more information at
http://source.sakaiproject.org/release/12.0/

Sakai 12.1 - release date 7 May, 2018, more information at
http://source.sakaiproject.org/release/12.1/

Sakai 12.2 - release date 19 June, 2018, more information at
http://source.sakaiproject.org/release/12.2/

Sakai 12.3 - release date 31 July, 2018, more information at
http://source.sakaiproject.org/release/12.3/

Sakai 12.4 - release date 26 September, 2018, more information at
http://source.sakaiproject.org/release/12.4

Sakai Virtual Conference was held online Nov. 7, 2018. There were 277 attendees from 9
countries and 59 institutions/organizations at this event, raising approximately $11,000 USD in
funding to be used for future Sakai Development. Recordings of the 37 presentations given by 46
presenters are available on the Sakai YouTube Channel.

Sakai 12.5 - release date 18 November, 2018, more information at
http://source.sakaiproject.org/release/12.5

Throughout 2018, the Sakai Marketing Working Group implemented a number of new initiatives,
including the new Sakai.LMS.org domain, a completely redesigned website which launched in Q4,
and the purchase of distribution rights to market data and reports from an independent research
firm.

2019 Sakai Highlights
The Sakai Camp strategic planning retreat was held in Orlando, FL on January 27-20, 2019. See
the article in Sakai News about Sakai Camp for a brief overview and agenda.

A new position of Sakai PMC Treasurer was created to assist with planning and management of
community funds, and Matthew Jones was elected Treasurer.

Sakai 12.6 - release date 5 March, 2019, more information at
http://source.sakaiproject.org/release/12.6

Sakai 19.0 - release date 21 March, 2019, more information at
http://source.sakaiproject.org/release/19.0/

Sakai Project Management Committee (PMC) elections were held in April-May, 2019. PMC
membership is reflective of significant contributions to the community and a dedication to the
shared goals of the Sakai community. Three new PMC members were elected to join the
committee: Matthew Hall - University of Virginia, Miguel Pellicer - EDF - Entornos de Formación, and Joshua Wilson - Longsight Inc. Also, three prior PMC members have now moved to Emeritus status: Matthew Buckett - University of Oxford, Adam Marshall - University of Oxford, and Chuck Hedrick - Rutgers University.

**Future Plans**

The Sakai Community has published a new three-year strategic roadmap to steer the ongoing, energetic, rapid innovation that is the hallmark of the Sakai LMS. This new plan builds upon Sakai’s track record of market leadership in higher education, as evidenced by independent survey research and market data. It prioritizes the development of teaching technologies that increase design flexibility for faculty and enable greater learning outcomes for students.

Adopted in January 2019 by Sakai Community institutions, this roadmap guides rapid innovation in response to faculty needs, represents Sakai’s dedication to meeting the needs of faculty and students with relevant advanced technology, highlights the impact that can be made by an energetic community leveraging an open platform, and encourages institutional support for Sakai’s rapid development.

**The Roadmap: Annual Areas of Focus**
- 2019: Rubrics, Tests & Quizzes, and Gradebook
- 2020: User experience and cloud storage integration
- 2021: Lessons 2.0, rapid grading, user experience, and analytics
- 2022: Tests and quizzes, notifications, other key enhancements

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<td>Document preview</td>
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Repositories and downloads
https://github.com/sakaiproject
http://source.sakaiproject.org/release/19.0/

Commercial Support
Longsight
EDF
Unicon
OpenCollab

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  2  107 Miguel Pellicer
  3    91 Sam Ottenhoff
  4    87 Brian Jones
  5    80 Code Hugger (Matthew Jones)
  6    45 Charles Severance
  7    44 Steve Swinsburg
  8    43 bgarciaentornos
  9    37 Bernardo
 10    37 Jose Cebellán
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 13    31 Eduardo Rey Jara
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 23    12 austin48
 24    11 Matthew Hall
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UniTime
https://www.unitime.org
**Status:** Graduated Incubation

**Background and Objectives**

UniTime is a comprehensive educational scheduling system that supports developing course and exam timetables, managing changes to these timetables, sharing rooms with other events, and scheduling students to individual classes. It is a distributed system that allows multiple university and departmental schedule managers to coordinate efforts to build and modify a schedule that meets their diverse organizational needs while allowing for minimization of student course conflicts. It can be used alone to create and maintain a school’s schedule of classes and/or exams or interfaced with an existing student information system.

The system was originally developed as a collaborative effort by faculty, students, and staff at universities in North America and Europe. The software is distributed free under an open source license in hopes that other colleges and universities can benefit their students through better scheduling or wish to contribute to ongoing research in this area.

**Technology**

UniTime is written in Java. It is using Hibernate to connect to MySQL or Oracle database. It deploys on Apache Tomcat. We use Spring Security for authorization and authentication (allowing for CAS or LDAP out of the box). Older pages are written using JSP and Apache Struts, newer pages use Google Web Toolkit. JGroups is used for clustering (including messaging and RPCs) and Infinispan for data replication within a cluster. Most modern web browsers are supported.

**Statistics**

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<td>(UniTime 3.0 first release)</td>
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### Contributors in 2018

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<th>Contributors in 2019</th>
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### Number of sites in use (estimated)

| Number of sites in use (estimated) | ~ 70 |

### Context

Most development is still being done at Purdue University or by the core UniTime team members. While we are getting more institutions involved, they often choose to sponsor the development of new features that they need rather than developing them in-house.

About 350 institutions have filled in our voluntary registration so far (about 60 have been added during the last 12 months). Here is a word cloud of the countries of our users, countries with more registrations are in larger letters.
2018 UniTime Highlights
UniTime 4.3 released in July 2018

In UniTime 4.3, all course timetabling solver pages have been rewritten to GWT, making the whole course timetabling component of UniTime fully localizable. There have been a number of new features added. These include the ability to export timetable grids into Excel, improved filtering of available suggestions, and the ability for a week to start on any day.

UniTime’s scripting and reporting capabilities have been greatly improved in this release. The scripts and reports recognize more parameter types. There is a new Script API, and the scripts can be scheduled to run periodically within UniTime.

A lot of work has been done to support the collection of student course requests and batch scheduling of students. An interface has been developed to allow custom validations and student course eligibility checking to be plugged into the Student Course Request page. There are more capabilities for academic advisors (and other administrative users) to monitor student progress as well as course availabilities. There have also been a number of improvements made to the batch student scheduling solver.

The number of UniTime manuals has grown substantially over the last year. For example, there is a new Administrative User Manual covering the initial configuration and setup of UniTime. See this document for all the available UniTime documentation.

2019 UniTime Highlights
UniTime 4.4 to be released in July 2019

UniTime 4.4 includes a lot of improvements in the student scheduling component. There are new solver constraints that can be used to better measure and optimize the quality of students’ schedules including early/late times, schedule gaps, travel times, lunch breaks, and long days. Test schedule runs can be automated and the results published to other users. A lot of changes have been done to the scheduling dashboard and the reservations. Students can prefer or require certain sections or instructional methods. Courses that are critical to certain students (that is, courses that these students need to make progress towards their degree) can be identified and such students prioritized in these courses.

A few improvements have also been done to data exchange, event management, and course timetabling (e.g., including the ability to combine last year’s course enrollments with pre-registration).

UniTime is co-organizing the International Timetabling Competition 2019 (ITC 2019, https://www.itc2019.org). The challenge is to build a solver for course timetabling problems that are similar to those addressed by UniTime. This will allow the competitors to compare their algorithms on real-world instances from institutions around the world (collected using UniTime). The goal of this competition is to promote research in this area as well as to create realistic benchmark data instances for the research community to use.

The competition was announced at the PATAT 2018 conference and the first timetabling problems have been published on November 15, 2018. The winners will be announced at the
PATAT 2020 conference next year. At the moment (as of May 2019), we have over 130 registered individuals and research teams from 44 different countries. This competition is sponsored by the PATAT conference, the EURO working group on Automated Timetabling, ORTEC, and the Apereo Foundation.

**Future Plans**
A lot of the new development will still focus on student scheduling (e.g., automated wait-listing). There are also plans to improve localization, accessibility, and documentation. We will continue the technology upgrade of older (JSP-based) pages. More work is also planned on integration with external systems. We also plan to build a user interface for a team building solver that is currently being piloted at Purdue University.

**List and link to repositories and downloads**
Repositories:
- https://github.com/UniTime/unitime
- https://github.com/UniTime/unitime-addons
- https://sourceforge.net/projects/unitime (includes secondary Git repo)
Downloads:
- https://github.com/UniTime/unitime/releases
- https://sourceforge.net/projects/unitime/files
- https://builds.unitime.org (nightly builds)

**List Commercial Support**
Most commercial support is undertaken by UniTime LLC (based in the USA) and UniTime, s.r.o. (based in the Czech Republic)

We have started cooperating with Naseej last year, which is providing commercial support for higher education institutions in the Arabic countries. They are working on implementing UniTime at a large institution in Saudi Arabia.
uPortal

**Status:** Graduated Incubation

**Background and Objectives**

uPortal is the leading open source enterprise portal framework built by and for the higher education community. The platform itself is complemented by a wide variety of projects that make up the greater uPortal Ecosystem. In the year to come, we expect to see continued growth, life, and participation in the community. We encourage community members to engage on the lists, enhance documentation, contribute a fix, or add a feature, propose a new sub-project, become an Apereo member, and become a uPortal Supporting Subscriber.

**Technologies**

uPortal is a Java-based, enterprise platform that embraces standards and collaboration to enhance the user experience of navigating the host institution. uPortal leverages existing services and data to build a set of user attributes and associations to provide a personalized view of content. It supports established technologies, such as JSR-286 Portlets for custom content. While also providing cutting edge infrastructure for the latest standards for web components. Front-end technologies that work in uPortal include AngularJS, ReactJS, Vue, and web components, to name some popular ones. There have been portals that solely rely on long-lived portlet applications to those that completely replace the standard them with technologies mentioned above. Of course, all this content requires access to back-end services. uPortal can integrate with databases, name directory services (i.e. LDAP and Active Directory), search engines, RSS/ATOM/iCAL, RESTful API endpoints, etc. All this allows for a very wide approach to each institution's uPortal service. Some are collections of app launchers that display a personalized list of content that redirects users to other campus services. While others, may provide a much deeper personalized view where interactions with other services, such as Student Information Services, are completely replaced with richer, custom components in uPortal.

**Statistics**

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<th>Contributors in 2018</th>
<th>Contributors in 2019</th>
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Number of sites in use (estimated)

Context
We have a significant increase in commits to uPortal (and related projects) due to automated support for keeping dependencies current. That said, we have several active contributors that have been focusing on the uPortal Web Components repo rather than directly to the core repo.

2018 uPortal Highlights
Maturing of uPortal 5, with initial support for Web Components

2019 uPortal Highlights
Additional refinement of Web Component usage and provision of sample components. There has been a significant increase in new portal designs, thanks to leveraging these new content items. uPortal Dev Days took place in Arizona.

Future Plans
Future plans are being established at Open Apereo 2019 in Los Angeles.

List and link to repositories and downloads
https://github.com/Jasig/uPortal/

Commercial Support
Unicon

uPortal committers
Drew Wills 105
Christian Murphy 543
Renovate Bot 6
C Beach 6
Alexandre Delpeuch 3
Rozier Guillaume 1
GIP RECIA - Julien Gribonvald 35
Benito Gonzalez 18
Matt Rapczynski 4
Mairi Fraser 4
Jonathan M. Tran 6
David Csakvari 5
Lauren Anderson 2
Sheraz Ahmed 2
Andrew Petro 28
jonathanmtran 2
Jacobus Crawford 1
Jim Helwig 2

uPortal-start committers
Drew Wills 156
Christian Murphy 735
Renovate Bot 7
C Beach 6
Alexandre Delpeuch 3
Rozier Guillaume 1
GIP RECIA - Julien Gribonvald 47
Benito Gonzalez 33
Matt Rapczynski 4
Mairi Fraser 5
Jonathan M. Tran 12
David Csakvari 5
Lauren Anderson 5
Sheraz Ahmed 2
Andrew Petro 28
jonathanmtran 3
Jacobus Crawford 1
Jim Helwig 2
Mark McLaren 1
ImgBotApp 1
samantha 2
Corey Rowe 2

uPortal Portlet and Supporting Artifact committers
Andrew Petro 146
Jonathan M. Tran 20
Benito J. Gonzalez 92
Christian Murphy 1602
Renovate Bot 96
Ben Sheffield 26
Christian Cousquer 95
Julien Gribonvald 196
Vincent Bonamy 8
Drew Wills 325
Jeff Sittler 25
Jeff 1
Ryan Mathis 94
Chris Paraiso 60
Lauren Anderson 33
Dan Rodziewicz 4
Dooremont Frédéric 1
Phillip Ball 14
David Witter 183
greenkeeper[bot] 27
David M Sibley 108
Doug Reed 40
Jim Helwig 8
snyk-bot 3
ImgBotApp 7
xdhmoore 1

Contributors
In Jasig/uPortal, 18 contributors
- Drew Wills
- Christian Murphy
• Benito Gonzalez
• Chris Beach
• Andrew Petro
• Brandon Powell
• Christian Cousquer
• Colin Campbell
• Mairi Fraser
• Allan Jackson
• Nisith Dash
• Corey Rowe
• Jonathan Tran
• Josh Brudnak
• KaJuan Johnson
• Ludovic Auxepaules
• Gary Roybal
• Timothy Vertein
Xerte

**Status:** Graduated Incubation

**Background and Objectives**
The Xerte Project aims to provide the very best open-source authoring system in its class for non-technical subject matter experts, developers and media specialists to collaborate in the production of interactive, highly accessible and engaging learning materials. It is used in hundreds of institutions around the world and accessed by millions of learners.

**Technology/ies**
PHP, HTML, JavaScript; JQuery

**Statistics**

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**Number of sites in use (estimated)**
300+

**Context**
Xerte is installed and managed by the institutions running it on a standard LAMP stack, support is via the forums on the Xerte website.

**2018 Xerte Highlights**
Xerte 18 Conference; several releases

**2019 Xerte Highlights**
Xerte Developer Event in York, new website (coming soon), new releases;
Future Plans: Community development via the website, ongoing developments
Future Plans
Community development via the website, ongoing developments

List and link to repositories and downloads
https://github.com/thexerteproject/xerteonlinetoolkits

List Commercial Support
https://learningapps.co.uk
Financial Report
Aperio released an RFP for audit services in April 2019. Due to a poor response, this was repeated in June. As a consequence, we anticipate providing a financial statement in August 2019.