The California Community College System (CCC) serves 2.75 million students at 112 California locations and is the largest system of public higher education in the world.

On March 11, 2011 the CCC FUSION System (Facilities Utilization, Space Inventory Options Net) with the entire California inventory of 71 million square feet of buildings and spaces, along with the CCC Geographic Information System (GIS) Collaborative of campuses and buildings was brought together with the “middleware” of the ONUMA System, making it the largest cloud computing Building Information Modeling (BIM) + GIS platform.

In a split second a “BIG BIM BANG” happened between FUSION+GIS+ONUMA to create a combined platform to dramatically expand the value of FUSION for CCC.

A wealth of CCC and related facility information is accessible visually and in real time in a simple online platform thereby saving time and money through automated synchronization of multiple databases.

What This Will Enable

California Community Colleges will now be able to visualize 2D and 3D floor plans with FUSION data that was previously only accessible in tabular format. Dynamic data driven floor plan graphics and site plans will allow for pattern recognition, better decision making and accounting of valuable facilities and assets.

Data visualization serves as a quality check -- highlighting discrepancies and creating a self correcting mechanism. Traditional methods of retrieving up to date floor plans and data are mired in inefficient processes that are difficult to access. California Community Colleges can become the leader in managing facilities with the latest in 21st century tools.

Planning of new facilities can work with historically accurate information from the FUSION+GIS+ONUMA Platform data and floor plans. One result could be cost effective Initial Project Proposals (IPPs), Final Project Proposals (FPPs), and other predesign planning being produced locally.

Furthermore contractors working with the community college districts can be provided integrated facility data to start new construction or renovations in BIM. Once the projects are completed the as-built information can be fed back into the FUSION+GIS+ONUMA Platform to support operations and maintenance.
The first districts to demonstrate the new FUSION+GIS+ONUMA integration are:

- Citrus CCD
- Foothill-De Anza CCD
- Long Beach CCD
- Los Rios CCD
- Rancho-Santiago CCD
- Sequoias CCD

With in-kind services for the demo provided by:
- San Joaquin Delta CCD
- South Orange County CCD

FUSION manages the web based data of 71-million square feet of facilities in the California Community College System. FUSION tracks the condition assessments and develops cost modeling for maintenance projects, enabling colleges to plan budgets and help facilitate the passing of much-needed bond measures.

The ONUMA System provides award-winning cloud computing integration that supports the full life-cycle of facilities and enables users to view graphics and real-time data on the web. It combines the best of BIM, GIS, and open standards systems acting as a middleware to enable visualization of complex data in a simple format. The ONUMA System is used from early planning to facility management; it links to other systems through web services and open standards exchanges such as CSV, KML, BIM IFC, COBie, XML and other formats.

**Four Levels of Detail**

The goal of the FUSION+GIS+ONUMA Platform is to have the entire state at Level 3. The initial goal was to have the entire FUSION System, which has a common naming and numbering system for the entire state, linked to the ONUMA System at Level 1. This strategy allowed for immediate functionality using the FUSION data as a common foundation to continually update the rest of the building as the data is collected in the future. Users with proper access will be able to view and analyze data.

**Level 1**
The initial launch of the FUSION+GIS+ONUMA Platform includes the entire state’s data of classrooms placed in the proper geographic location adjacent to the campus property line.

**Level 2**
The six districts initially demonstrating the FUSION+GIS+ONUMA Platform will also have the campus building footprints from GIS placed in the proper locations and spaces from FUSION will be placed in the buildings.

**Level 3**
One building from each of the initial districts will also have the actual layout of the building based on floor plans with rooms from FUSION.

**Future Capability**

**Level 4**
The ONUMA System has other capabilities built into it like viewing and editing room level furniture and equipment. As a middleware it also links to other BIM, CAD and GIS Systems. This capability is available for future use.
Functionality of FUSION+GIS+ONUMA Platform

Individual User Log In
The pilot phase of this project will provide each district with 60 days of free access to the FUSION+GIS+ONUMA Platform. Districts have the flexibility of beginning the 60 day trial at their convenience. Each user has access to the proper level of detail of graphics and data. They can view or edit through a web browser, installing no software. This strategy allows “viewers” to see data live as it is made available by editors and administrators of the system.

Entire State Portfolio Level View
View all campus sites as links on a web-based map. Everything can have a latitude and longitude down to the piece of equipment in a room. This is not a trivial accomplishment and makes real, the connection of building models and GIS in a tangible way, thus enabling location based tracking of information across the entire portfolio.

Campus Site Plans
With proper access levels, clicking on a dot opens the site plan and building footprints of that campus, live links to geographic data from Google Earth and the CCC GIS Collaborative Server along with color coded building plans and other live elements from FUSION data.

Building Floor Plans
Floor plans that are traditionally managed in static CAD or PDF plans are made live. As data changes in FUSION it will change the graphics in the floor plans. This strategy is what will allow the data to live and be accurate over time, rather than having to constantly update it manually.

Space Floor Plans
It is also possible to layout and plan for new spaces, furniture, equipment or manage existing spaces. This is a Level 4 detail that is available in the system but will not be used in the initial development.

Reports and Analysis
Reports can be generated directly from the graphics. FUSION data can also be shown in these reports. Data can also be exported in many open standard formats such as Google Earth, BIM via IFC and BIMXML, COBie, OGC OWS4, CSV or EXCEL Tables.
Technological Requirements
One of the most powerful aspects of the FUSION+GIS+ONUMA Platform is that any computer with access to the internet can be used and software installation is not needed to start interacting with the data. In the past, complex desk bound PC systems required expensive software and training to get to basic information. Those barriers are removed with the FUSION+GIS+ONUMA Platform. This allows both technical and non-technical users to work from their platform of choice with minimal hardware requirements and software training.

Operating Systems and Web Browsers
Firefox, Chrome or Internet Explorer 8 and later on Windows
Safari, Firefox, Chrome on MacOS X

Plug-ins to view additional 2D and 3D graphics
Adobe Flash
Google Earth Plug In
Graphisoft GDL Web Control - Version 13

iPad, iPhone and Android
The explosion of smart phones and apps on iPhones and Androids demonstrates the need to use simple tools to view and analyze data. The solution shown here supports all of this and more. The iPhone and Android UI can view and edit some data, and view 2D Graphics. This can also be used for field collection of data directly into the ONUMA System.

Links to Other Tools
Excel
ArchiCAD
Autocad Revit
Autodesk Vasari
Autodesk Ecotect
Trelligence
Google SketchUp (Free and Pro Version)
Google Earth (Free and Pro Version)
ArcGIS

Open Industry Standards
buildingSMART alliance
Industry Foundation Classes (IFC)
Open Geospatial Consortium (OGC)
World Wide Web Consortium (W3C)
Green Building XML (gbXML)
Construction Operation Building Information Exchange (COBie)
REST and SOAP Web Services
FUSION+GIS+  

CLOUD COMPUTING

The Internet has changed everything. Smart phones and location aware services allow instant and easy access to complex relevant real-time information with little or no training.

The old model of “importing” all data into one monster desktop bound system is rapidly dying. The new model of using the Internet and “services” to subscribe to information that is the authoritative source is the scalable solution for complex data.

FUSION+GIS+ONUMA linked together as cloud based services make this a reality for the California Community Colleges. This initial implementation provides exponential value but is really just the tip of the iceberg as more functionality is added in simple and economical way as needed.

MIDDLEWARE

With FUSION as the master repository of facility data, GIS mapping the location of campuses and buildings and ONUMA as the integrating middleware bringing it all together -- the FUSION+GIS+ONUMA platform is born.

OPEN STANDARDS

Just like the Internet is not one web site, the FUSION+GIS+ONUMA Platform is not created around one solution. The complexities of 21st century facilities cannot be managed by any single monolithic software.

The use of open standards will support plugging and playing different systems. Avoiding proprietary locked systems will future-proof the data being managed for the California Community Colleges.

As new needs arise they can be added as modules to the system. The FUSION+GIS+ONUMA Platform builds the initial infrastructure for this open standards implementation and invites collaborators and future competitors to enhance the capabilities of this ecosystem. We challenge the industry to plug in and share.
Information and graphics
Data connected to graphics makes it easier to rapidly analyze and make decisions with information.

Building Information Modeling (BIM)
4,000 buildings from the entire state are available at varying levels of detail, ready to be opened in tools like Revit, Archicad, Bentley, Vectorworks, Onuma and other BIM applications.

Geographic Information Systems (GIS)
Every piece of data is referenced to a geographic location and can be analyzed in various GIS applications. All buildings can be opened and viewed in Google Earth.

Facility Management (FM)
Data is formatted to be used by FM systems. All buildings can be exported in the open standard COBie format.

Computer Aided Design (CAD)
2D and 3D data for the entire state is now connected to graphics which can be accessed in a simple format.

Three Dimensional Models
Buildings can be viewed in 3D and exported to other formats such as Google SketchUp and BIM.

Connect with Open Standards
The platform is set up to allow exporting and importing data with open standards exchanges such as IFC, XML, COBie, KML, CSV and other formats.

Web Services and the Cloud
Other systems can also connect through web services. In the same way that FUSION is connected to ONUMA System live through webservices, other systems could also connect.

For More Information
http://www.foundationccc.org/WhatWeDo/FUSION/tabid/76/Default.aspx
http://cccgis.org
http://ONUMA.com/FUSION

BIG BIM little bim:
http://www.4sitesystems.com