



# Bentley's travels in the Open Source World

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# Bentley is a software company

AECOSim  
AssetWise  
AutoPIPE  
AutoPLANT  
AXSYS

MOSES  
Navigator  
OpenBridge  
OpenPlant  
OpenRail

Communications  
ComplyPro  
ConstructSim  
ContextCapture  
Descartes  
gINT  
Haestad

OpenRoads  
OpenUtilities  
PlantWise  
Pointools  
ProjectWise  
Promis.e  
ProStructures



Hevacomp  
LARS  
LEAP  
LumenRT  
Map  
MAXSURF  
MicroStation  
MineCycle

RAM  
RM  
SACS  
SITEOPS  
speedikon  
STAAD  
SUPERLOAD

3541 employees  
752 SW Development/Release Engineering

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# Why?

- Brief History

- CS-Map coordinate system library in Bentley Map / Microstation (2003)
- OGR – shapefile import in MicroStation (2005)
- **MapServer / Openlayers in AssetWise (2013)**

- Reason behind it?

- Very mature Open source projects
- Well documented
- Feature rich
- Limited internal resources
- Difficult to compete in terms of features and quality

# What?

- Mapserver

- Map rendering engine
- Server side Spatial publishing (Oracle/SQL server -> WMS/WFS)

- Openlayers

- switched to OL3 immediately after official release

- Why the choice?

- Mapserver/Geoserver: Limited exposure to java technology stack – preference to have C/C++ based software (.NET based even better – Bentley is mostly using Microsoft Infrastructure including Azure
- Openlayers/Leaflet: At the time, more homogenous, mature framework



OpenLayers 3.0



# What?

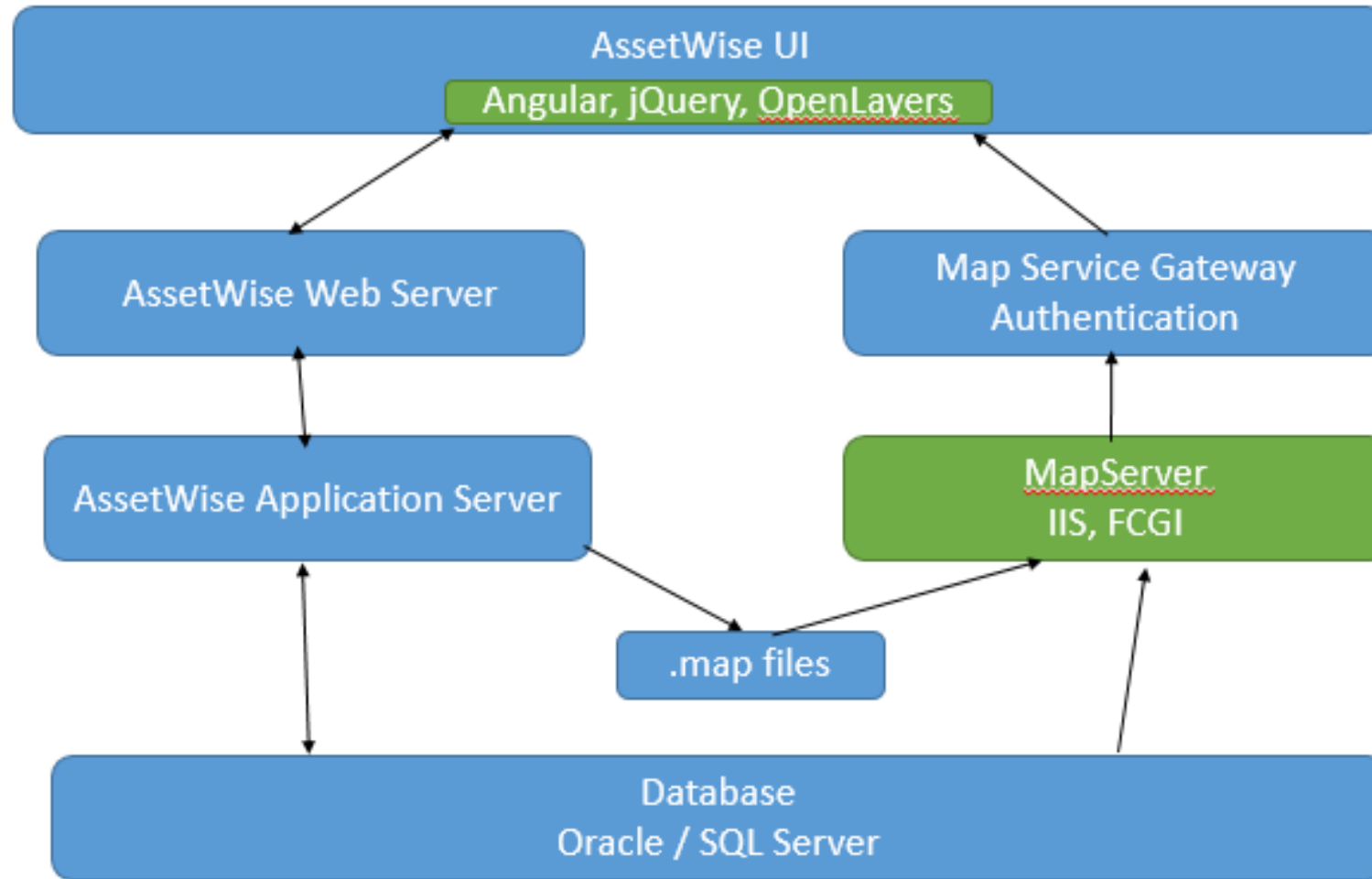
- CesiumJS
  - an open-source JavaScript library for managing 3D data



# Where?

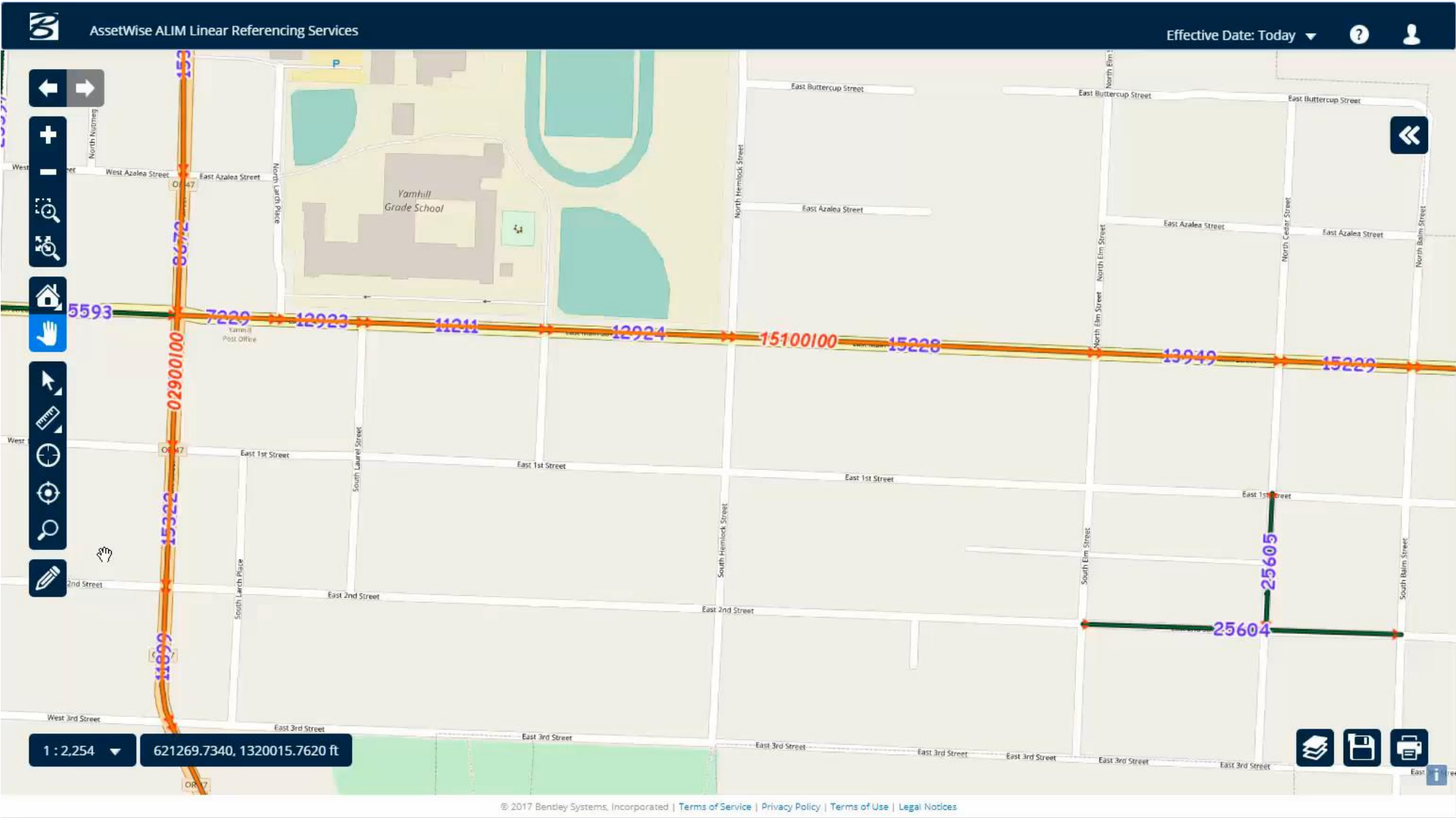
- AssetWise (visible in the UI)
  - MapServer
  - OpenLayers
  - Cesium
- MicroStation / Bentley Map (under the hood)
  - CS-Map
  - OGR (SHP import)

# (web) Technology stack





# Feature editing with OpenLayers



# Visualizing 3d data with Cesium



# Challenges faced

- Cultural

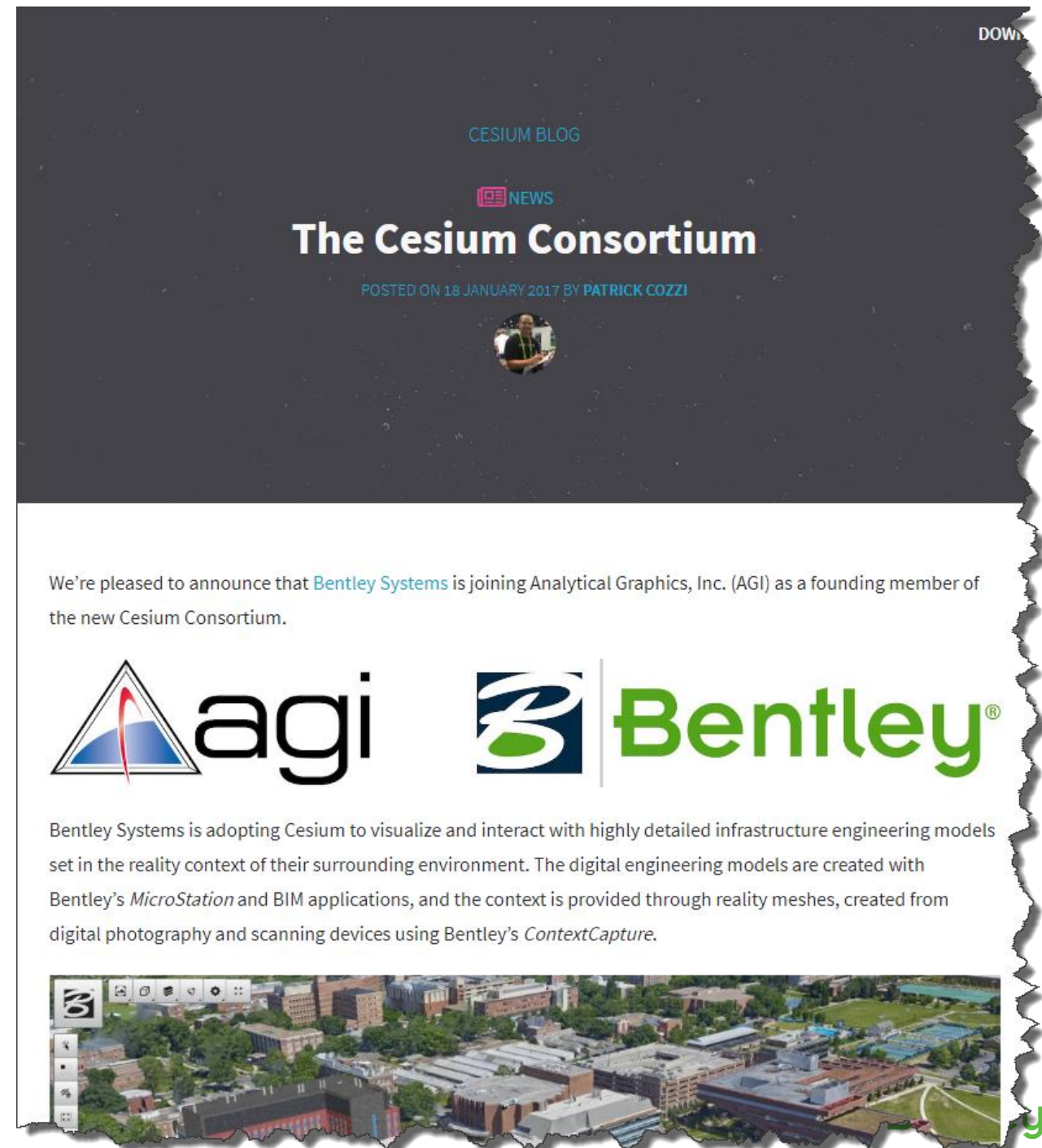
- Big company, lots of in-house systems. Corporate ecosystem
  - Over-estimation of internal SW quality compared to popular OS software
- Can we really be dependent on free software?
  - Javascript's huge ecosystem with a big choice of .js libraries helped a lot
    - Nowadays no-one is working WITHOUT OS software

- Technical

- Sync repositories
  - In the past – load one OSS version into our private source control system – do our own enhancements / fixes – unable to sync back / contribute
  - Now - forked GitHub repositories – pull requests and frequent updates of the OS s/w.

# Community engagement

- Cesium consortium
  - Partnership with AGI



DOWN

CESIUM BLOG

NEWS

## The Cesium Consortium

POSTED ON 18 JANUARY 2017 BY PATRICK COZZI



We're pleased to announce that [Bentley Systems](#) is joining Analytical Graphics, Inc. (AGI) as a founding member of the new Cesium Consortium.



Bentley Systems is adopting Cesium to visualize and interact with highly detailed infrastructure engineering models set in the reality context of their surrounding environment. The digital engineering models are created with Bentley's *MicroStation* and BIM applications, and the context is provided through reality meshes, created from digital photography and scanning devices using Bentley's *ContextCapture*.



y

# Community engagement

- Mapserver
  - Several Pull requests
- Openlayers
  - todo...

Fix error to support Oracle compound elements for GTYPE 2007 #5459

Merged jmckenna merged 1 commit into `mapserver:branch-7-0` from `BentleySystems:fix-oracle-gtype-2007-with-compound-elements` 26 days ago

Conversation 2 Commits 1 Files changed 1 +1 -1

micking commented 26 days ago Contributor

Fix error to support Oracle compound elements for GTYPE 2007 (multipolygon) and not only for GTYPE 2003 (polygon)

Fix error to support Oracle compound elements for GTYPE 2007 (multipo... be21bcf

micking referenced this pull request 26 days ago

Oracle MultiPolygons with compound elements cause WMS layer request to fail #5458 Open

msmitherd commented 26 days ago Contributor

this is good to merge.

jmckenna merged commit 57ceec7 into `mapserver:branch-7-0` 26 days ago View details

2 checks passed

jmckenna commented 26 days ago Member

thanks @micking !

Reviewers: No reviews

Assignees: No one assigned

Labels: None yet

Projects: None yet

Milestone: No milestone

3 participants

# Is it working out?

- Positive feedback from
  - Users
    - Like to see well-known components in our software
    - Often a good fit to their ecosystem
    - Sometimes a selling point!
  - Bentley colleagues
    - Like quality and responsive support
  - Senior management
    - Likes software reuse, quick progress using mature libraries and standards

# What's next?

- Cesium / 3D Tiles ongoing
- OGR driver for Dgndb
  - DGNdb – new SQLite based format for storing/syncing design content.  
internal discussions- Similar to Geopackage
- Push OL3 changes back to repository

-THE END-  
Questions?