Bentley’s travels in the Open Source World
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Pano Voudouris
Martin Icking
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
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

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.
Community engagement

- Mapserver
  - Several Pull requests
- Openlayers
  - todo…
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?