

# Open-Source Collaborative Mapping

Alexandria Shreffler

*Pennsylvania State University  
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Alexandria Shreffler



Venango County  
Regional Planning  
Commission

*Geospatial Analyst*

Topic

Background

Project Goals

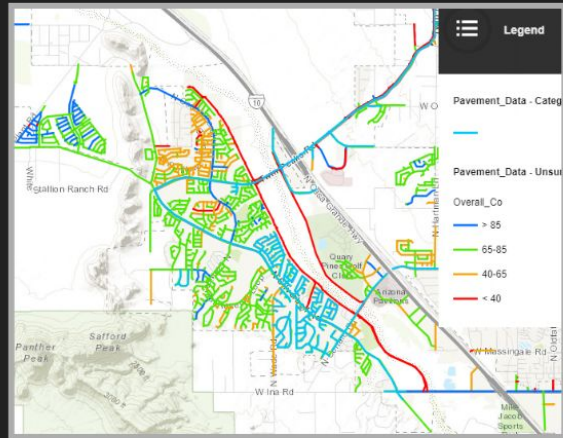
Prototype Specifications

Framework Evaluation

Recommendations

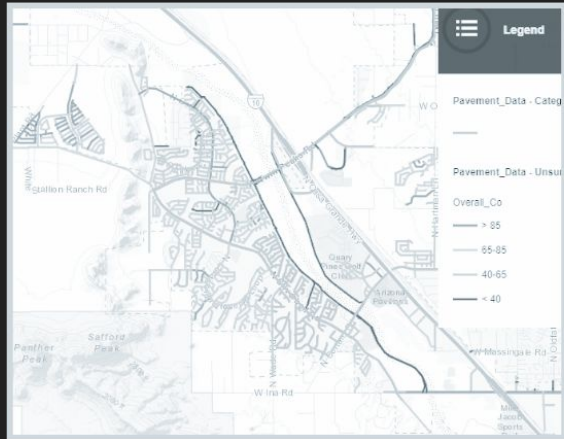
Conclusions

"Where have we been?"

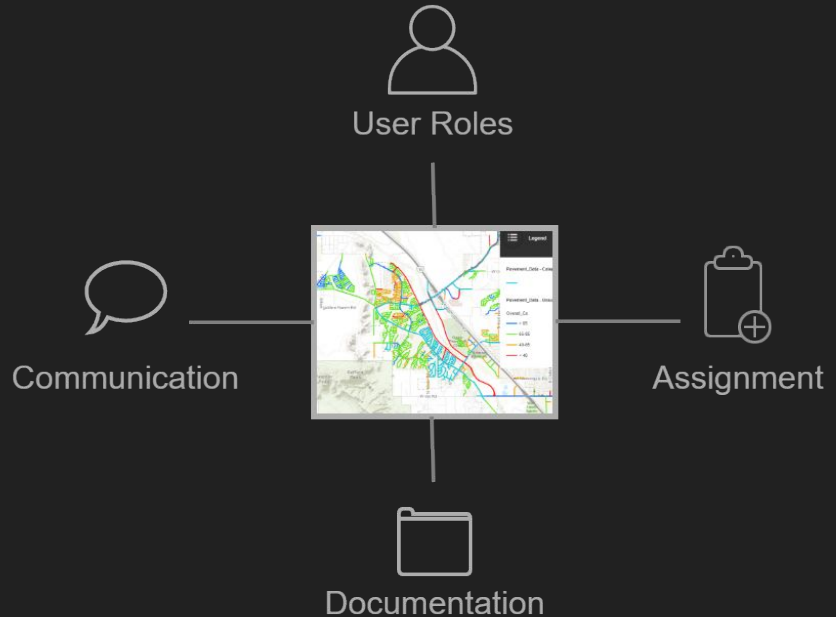


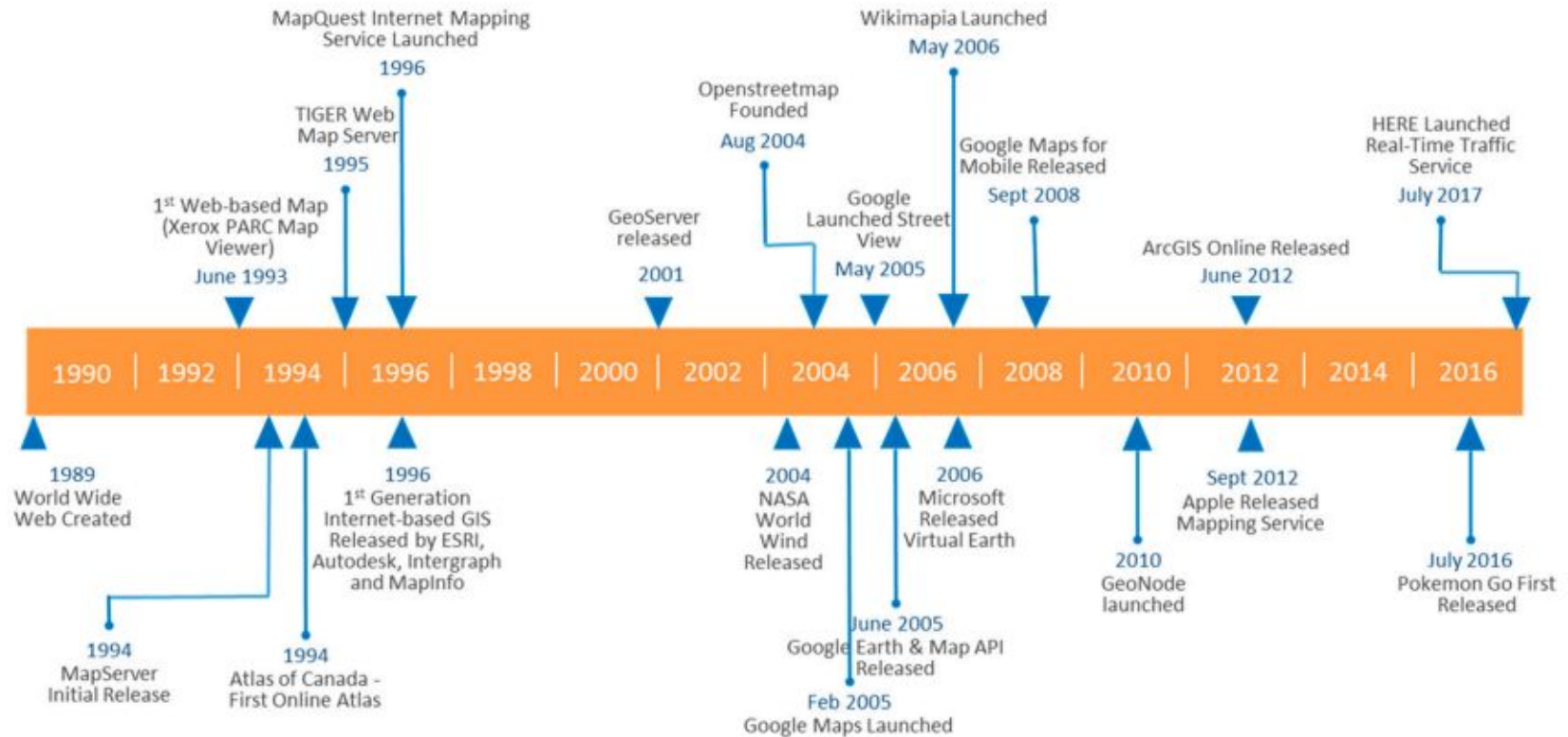
# Collaborative Mapping

"Where have we been?"



"Where should we go?"





**Figure 1.** Timeline of some significant web mapping events.

## ArcGIS Online Will Change How You Think about Mapping and GIS

Organizations Can Now Purchase ArcGIS Online Subscriptions and Immediately Unlock Their Geospatial Content

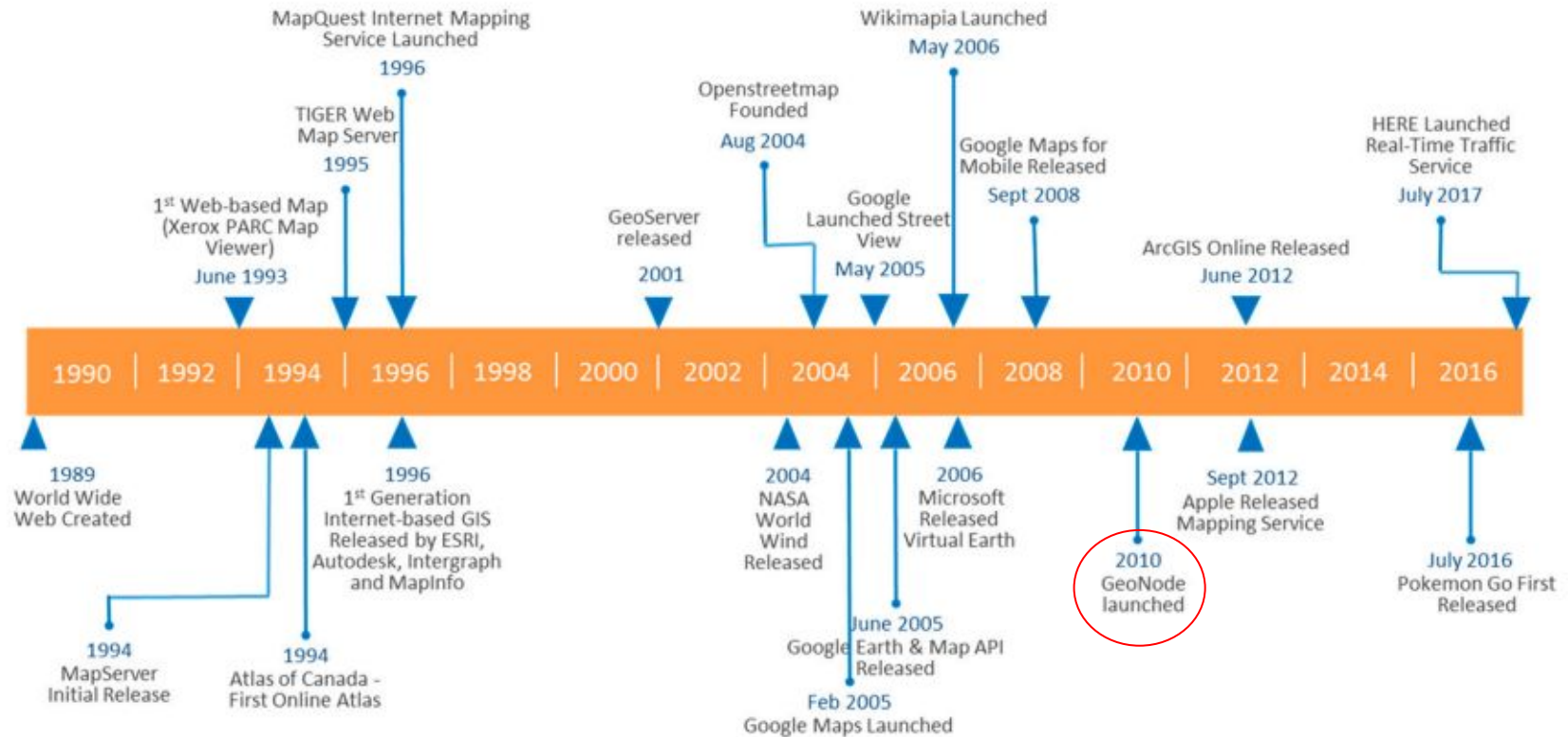


June 14, 2012

**Redlands, California**—Esri, the global leader in geographic information systems (GIS), today officially released [ArcGIS Online](#) for organizations, a groundbreaking service that offers expanded collaboration tools for cataloging, visualizing, and sharing geospatial information.

"ArcGIS Online is a new cloud-based mapping system for organizations that is essentially changing how GIS managers, as well as IT managers, think about mapping and GIS," said Jack Dangermond, president, Esri.

"ArcGIS Online works with all types of data and is built on a powerful enterprise mapping platform that lets users simply manage their geospatial content, such as data, maps, images, applications, and other geographic information."



**Figure 1.** Timeline of some significant web mapping events.




# GeoNode




- Geospatial Content Management System (GeoCMS)
- Platform for deploying spatial data infrastructure (SDI)
- Open Source Geospatial Foundation (OSGeo) project

**GEONODE IS MADE FOR**

*From <https://docs.geonode.org/en/master/about/index.html>*



**Users**  
who log into a GeoNode website and use its functionality.



**Administrators**  
who install and deploy GeoNode websites in production for their Users.

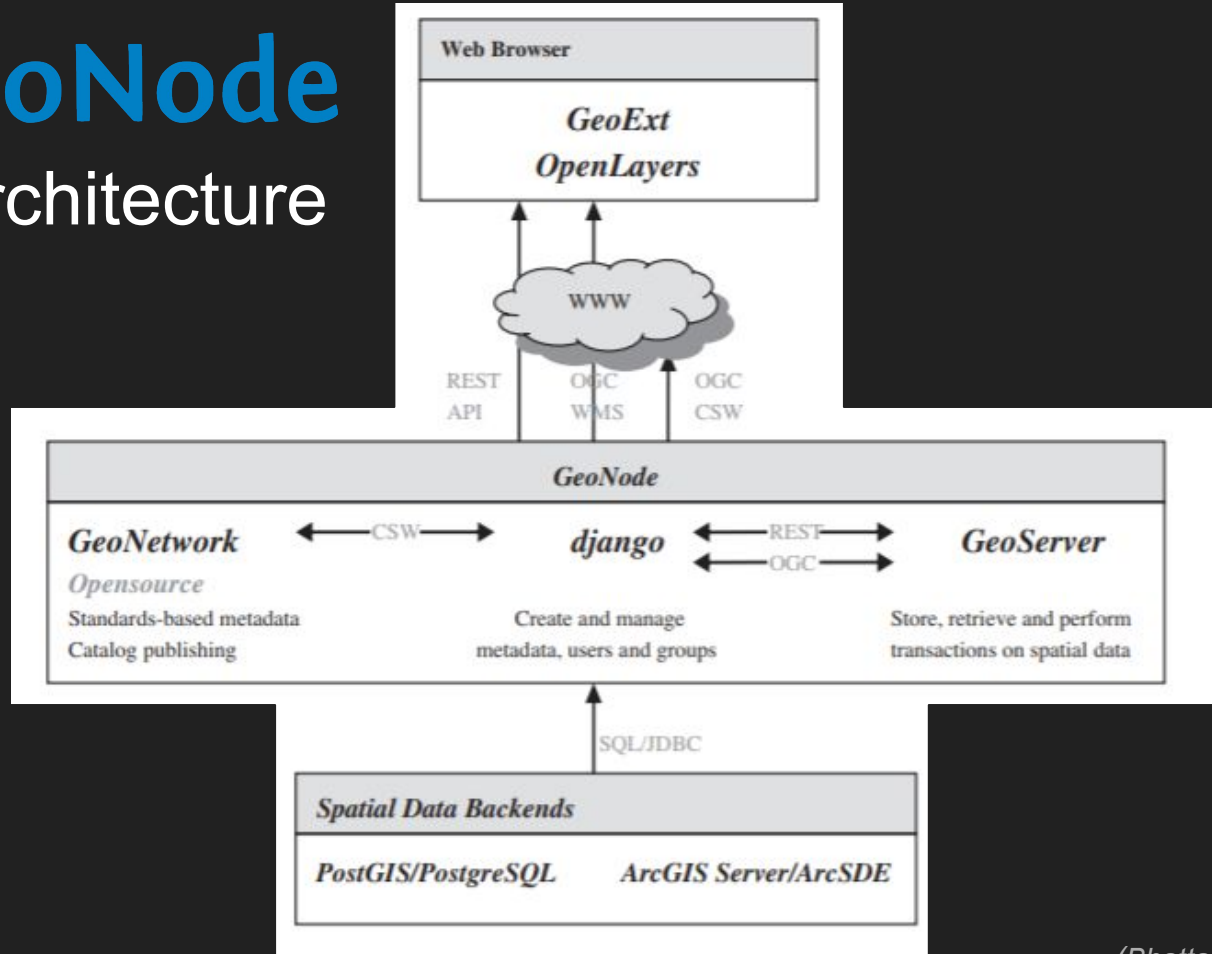


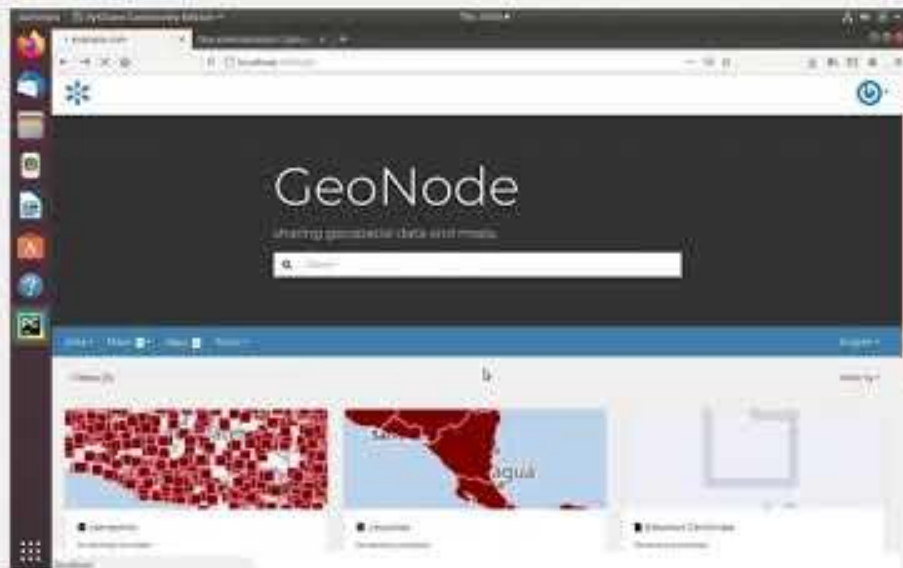
**Developers**  
who write code to add functionality, integrate with other systems, fix bugs, and potentially help an Administrator setup a server and deploy a GeoNode instance for production.



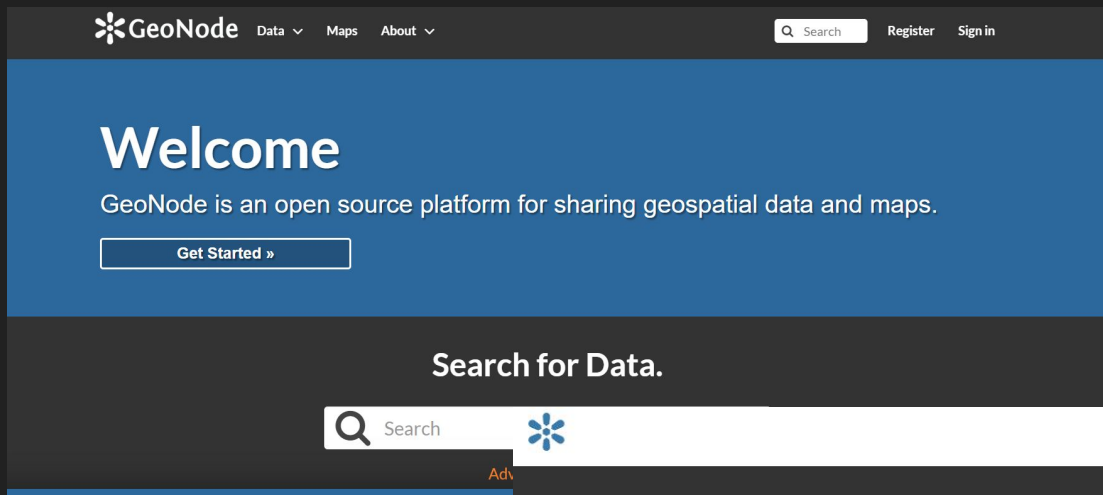


# GeoNode Architecture





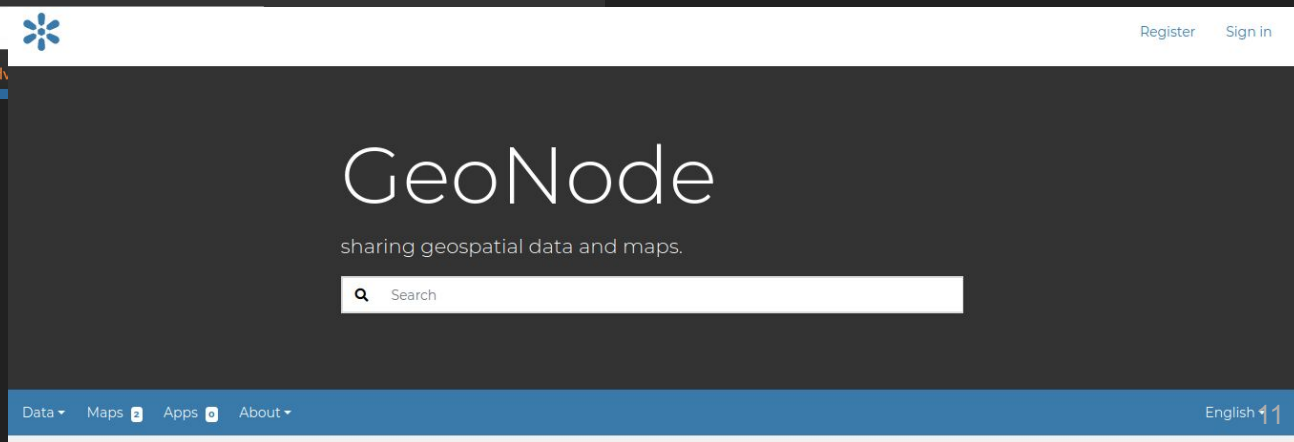
# May 2020 | GeoNode Upgraded to Version 3.0



- Integration of MapStore as new map viewer/composer
- Improved Message Inbox and Messaging & Notification System

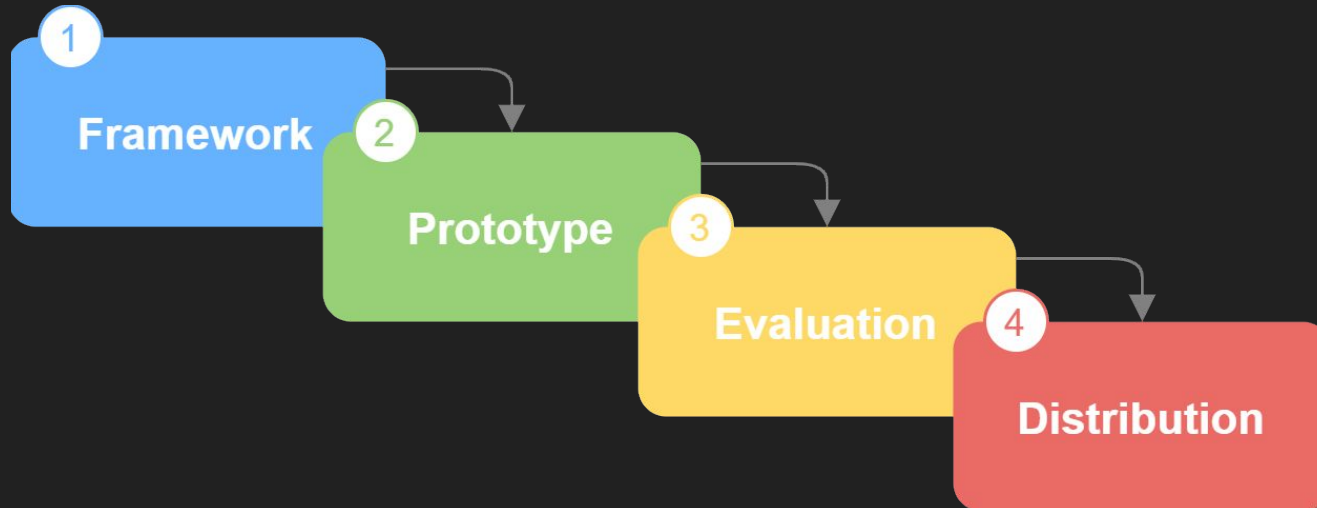
<https://github.com/GeoNode/geonode/releases>

Demo



# Project Goals

- Open-source **Framework** development supporting collaborative mapping
- **Prototype** testing and development in GeoNode
- **Evaluation** of GeoNode as a platform for providing collaborative functionality
- **Distribution** of material for use in the GIS community and beyond

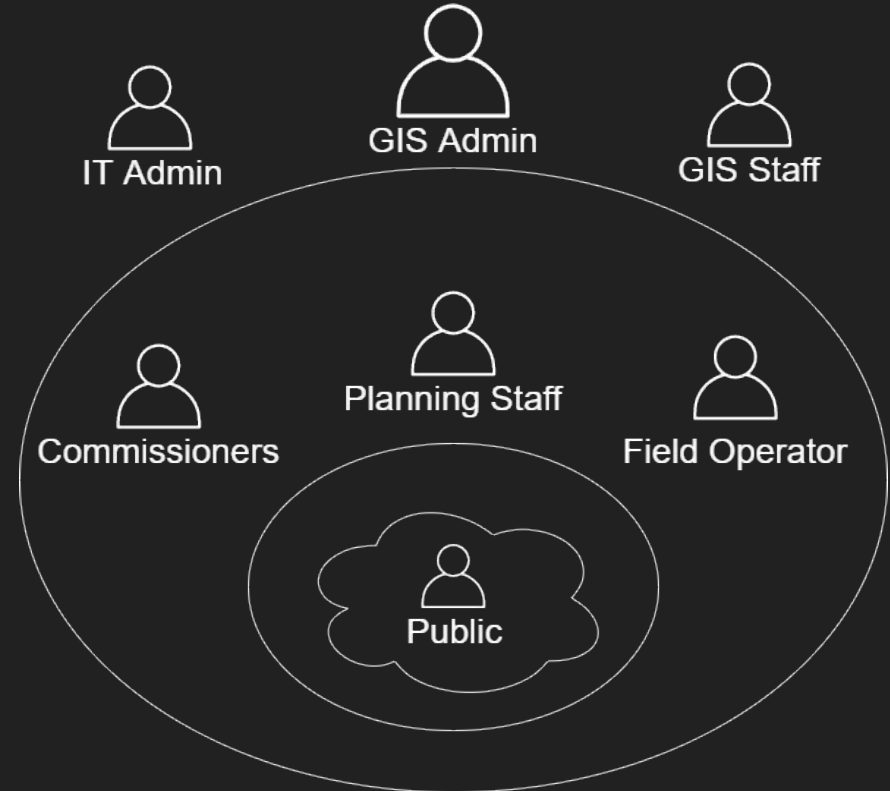




# Venango County Regional Planning Commission

1. Form Submission
2. Feature Assignment
3. Queue Completion
4. Documentation
5. Communication

## Use-Case Scenario

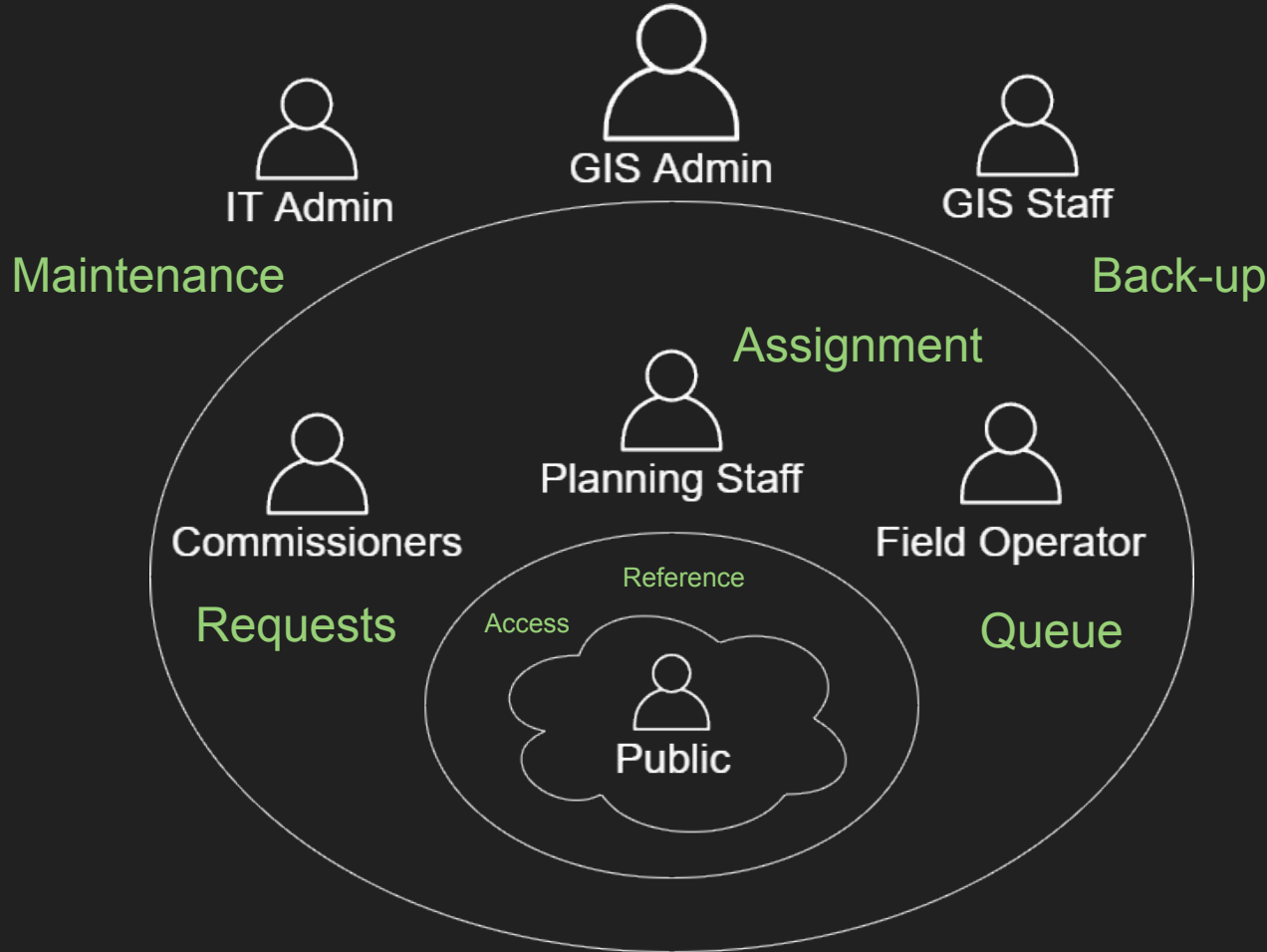




Universal

Comment  
Documents

Upload  
Create

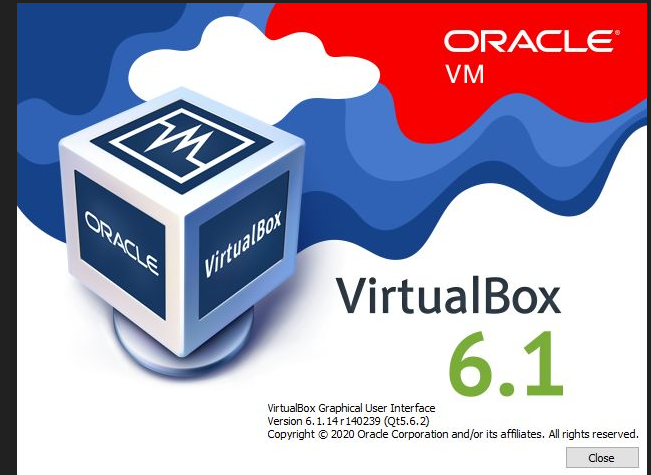
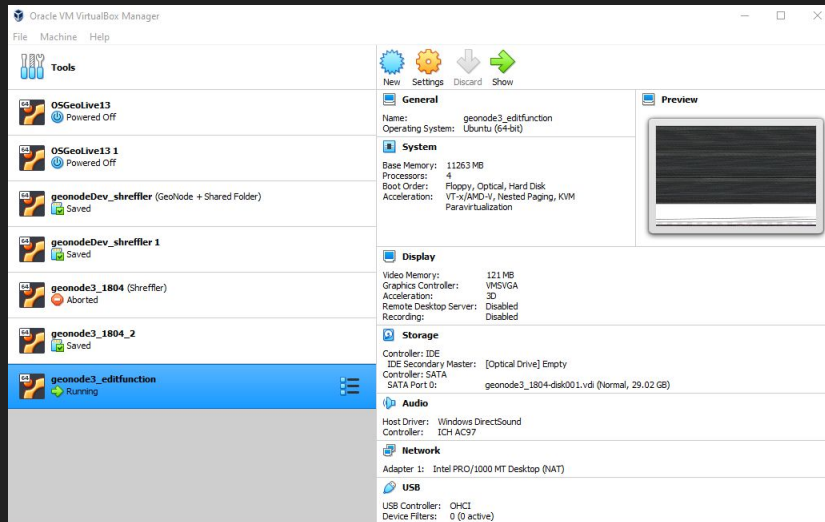


# Prototype

## System Specifications

# Set-Up: Virtual Machine specifications

- Preferred OS is Ubuntu - need to install virtualization software
- Build a virtual machine
- Configure the virtual machine



GeoNode Installation Instructions:

[https://github.com/gannebamm/geonode-workshop/tree/main/00\\_getStarted](https://github.com/gannebamm/geonode-workshop/tree/main/00_getStarted)



# Installation

- GeoNode prerequisites (terminal code)
- Clone the GitHub repository
- Create a Python Virtual Environment

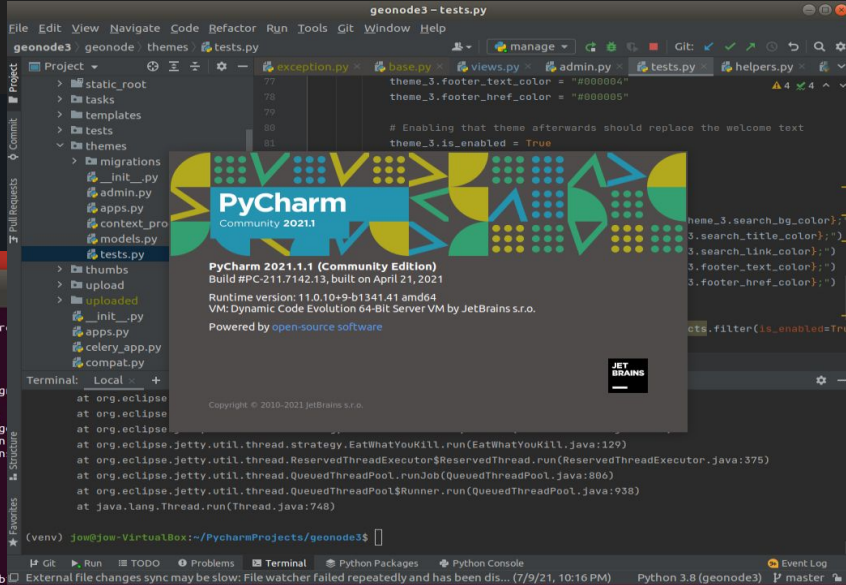
```
sudo add-apt-repository ppa:ubuntugis/ppa
sudo apt update -y; sudo apt upgrade -y;
```

```
# Install packages from GeoNode core
sudo apt install -y build-essential gdal-bin \
python3.8-dev python3.8-venv virtualenvwrapper \
libxml2 libxml2-dev gettext \
libxslt1-dev libjpeg-dev libp
software-properties-common bu
git unzip gcc zlib1g-dev libg
sqlite3 spatialite-bin libsql
```

```
# Install Openjdk
## we will use this to run GeoSer
sudo apt install openjdk-8-jdk-he
sudo update-java-alternatives --j
```

```
# Verify GDAL version
gdalinfo --version
$> GDAL 3.0.4, released 2020/01
```

```
git is already the newest version (1:2.17.1-1ubuntu0.8).
The following packages were automatically installed and are no longer r
libc-ares2 libhttp-parser2.7.1 libuv1 libuv1-dev
linux-hwe-5.4-headers-5.4.0-42 linux-hwe-5.4-headers-5.4.0-64
linux-hwe-5.4-headers-5.4.0-67 linux-hwe-5.4-headers-5.4.0-70
linux-hwe-5.4-headers-5.4.0-71 linux-hwe-5.4-headers-5.4.0-72
node-ansi-color-table node-archy node-builtin-modules node-fstream-ig
node-github-url-from-git node-hosted-git-info node-ini
node-is-builtin-module node-lockfile node-lru-cache node-mute-stream
node-normalize-package-data node-pseudomap node-read node-read-packag
node-spdx-license-ids node-underscore node-validate-npm-package-licen
node-yallist nodejs-doc
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 43 not upgraded.
Jow@Jow-VirtualBox:~$ gdalinfo --version
GDAL 3.0.4, released 2019/06/20
Jow@Jow-VirtualBox:~$ python3.8 --version
Python 3.8.0
Jow@Jow-VirtualBox:~$ java -version
openjdk version "1.8.0_292"
OpenJDK Runtime Environment (build 1.8.0_292-8u292-b10-0ubuntu1-18.04-0
OpenJDK 64-Bit Server VM (build 25.292-b10, mixed mode)
Jow@Jow-VirtualBox:~$
```



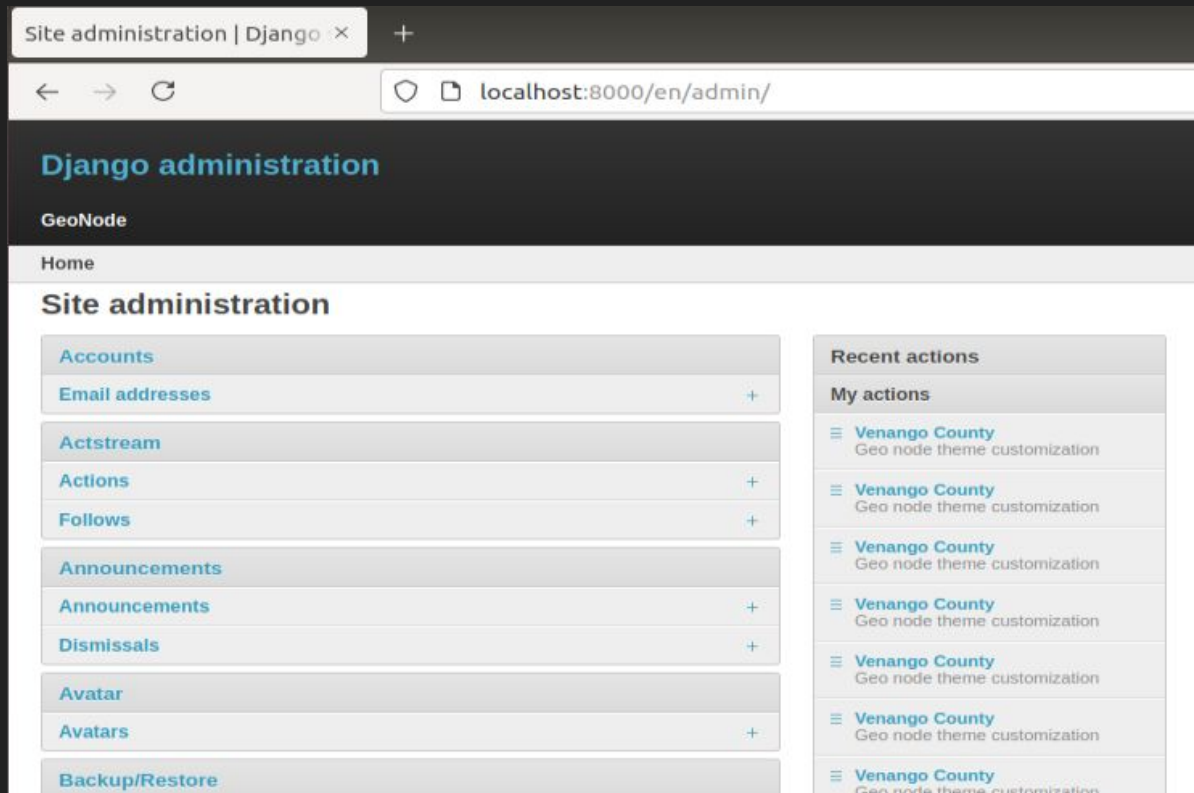
# Testing

- Start GeoNode, GeoServer
- Browse to localhost
- Debugging



# Development

- Django Admin page
- Create themes
- Organize groups
- Upload logos
- Bulk operations
- Usage monitoring
- ... many modules!



# Use

- Add layers, docs
- Edit metadata
- Style layers
- Create maps
- Comments

## Activity Feed for Group1

All Layers Maps Documents Comments



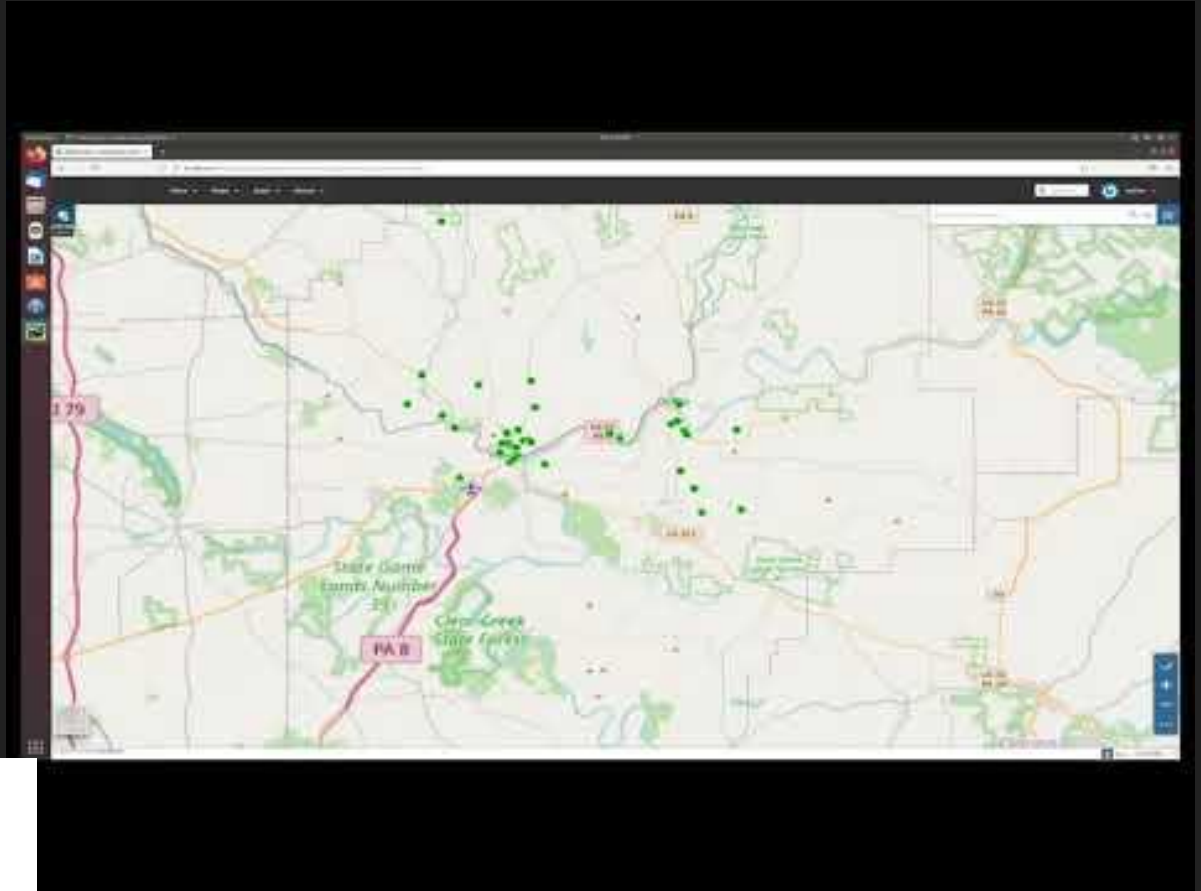
aleshreffler added a comment on geonode:boston\_public\_schools\_2012\_z  
2 minutes ago

### Comments (1 total)



This layer is great!  
By aleshreffler on Jul 16, 2021

Delete





- Community support is **responsive**
- Command-line installation is **tricky**
- **High levels of programming** required for some installation methods

## Evaluation

### ✓ Ease of Development

- ✓ Installation
- ✓ Reference
- ✓ Programming

### ✓ Level of Support for Key Features

- Default Views
- Panel Customization
- Document Attachment
- Case Notes
- Queue Assignment

### ✓ Invested Resources

- 📄 Hardware
- 🕒 Time
- ⚙️ Expected Ongoing Maintenance



- Documentation and Communication are **well-supported**
- Feature Assignment and Queue Completion requires a **work around**
- Form Submission would require **significant development**

## Evaluation

### ✓ Ease of Development

- ✓ Installation
- ✓ Reference
- ✓ Programming

### ✓ Level of Support for Key Features

- Form Submission
- Feature Assignment
- Queue Completion
- Documentation
- Communication

### ✓ Invested Resources

- 🔧 Hardware
- 🕒 Time
- ⚙️ Expected Ongoing Maintenance



- One laptop, many virtual machines
- Over 1000 hours invested
- Production setting would require significantly more time and resources to develop

## Evaluation

### ✓ Ease of Development

- ✓ Installation
- ✓ Reference
- ✓ Programming

### ✓ Level of Support for Key Features

- Form Submission
- Feature Assignment
- Queue Completion
- Documentation
- Communication

### ✓ Invested Resources

- 🔧 Hardware
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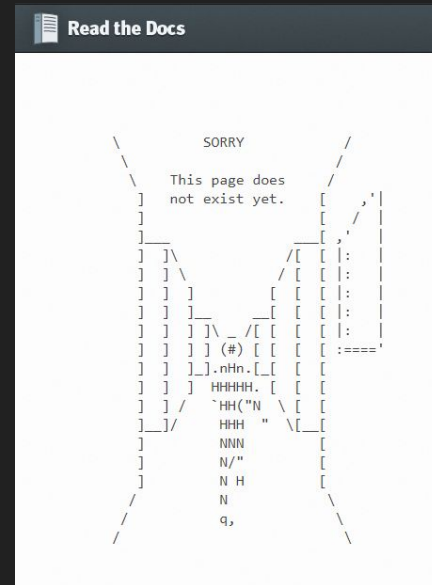
## Pros



## Cons

- Unlimited number of users and groups
- Total control over who has access
- Community support
- Variety of installation methods
- Django framework is adaptable

- Windows installer was deprecated
- Installation can be confusing
- Lack of consolidated documentation





# Outcomes



<https://github.com/aleshreffler/geonode-project>



<https://tinyurl.com/GeoNode2021>

# Recommendations

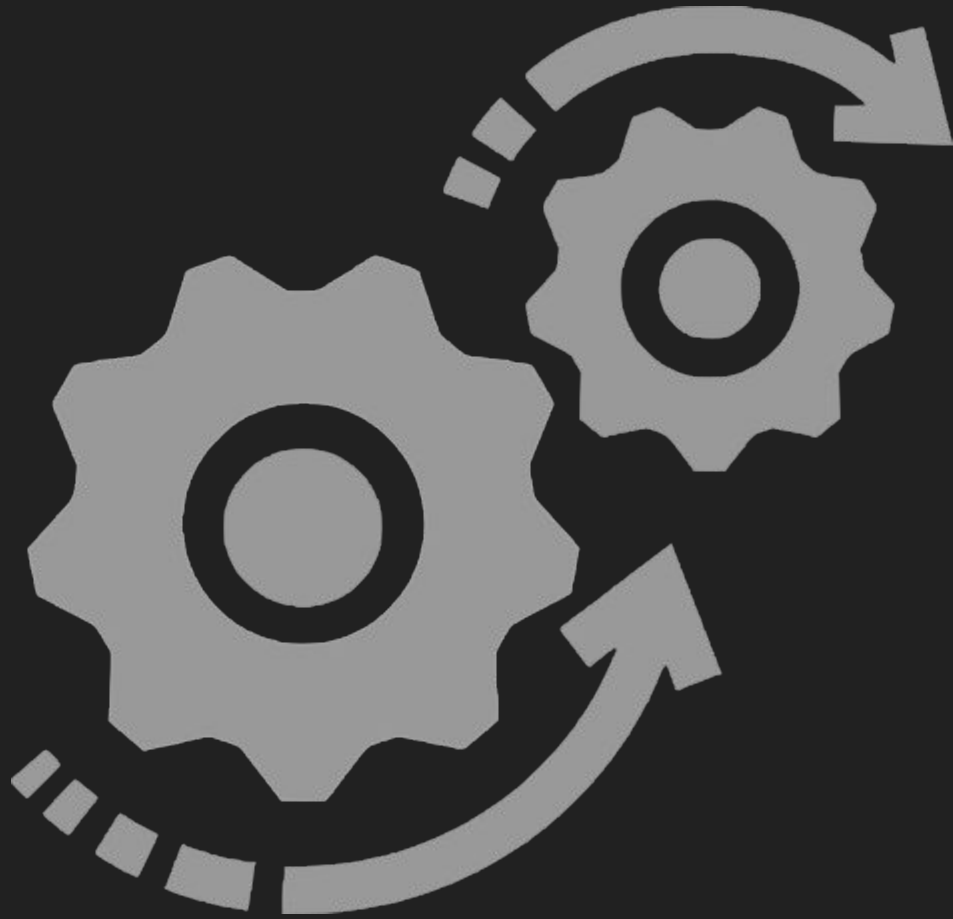
## Experienced Developers

- Documentation, documentation, documentation...
- Provide links to external resource when necessary
- Develop form functionality

## New Developers

- Learn Python
- Get to know the terminal
- Ask the community
  - GitHub, Gitter chat
  - StackOverflow
  - User group email lists

OSGeoLive (<http://live.osgeo.org/en/index.html>) version 14.0





Alexandria Shreffler

*Geospatial Analyst*

**Venango County Regional Planning Commission**

**1168 Liberty Street | PO Box 831 | Franklin PA**

 » 814-432-9676

 » [ashreffler@co.venango.pa.us](mailto:ashreffler@co.venango.pa.us)

 » [aleshreffler@gmail.com](mailto:aleshreffler@gmail.com)



# Presentation References

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