

Epidemiological Modeling Portal



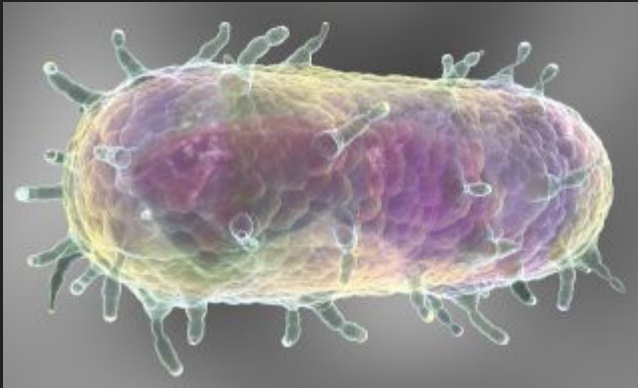
Pandemic Processing

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Mentor: Dr. Eck Doerry

Introduction

Plagues

- Plague of Justinian in 541 and lasted 200 years.
 - 25-50 million deaths
- Black Death during 1347-1350
 - Killed ~60% of the European population



West Africa Ebola Outbreak

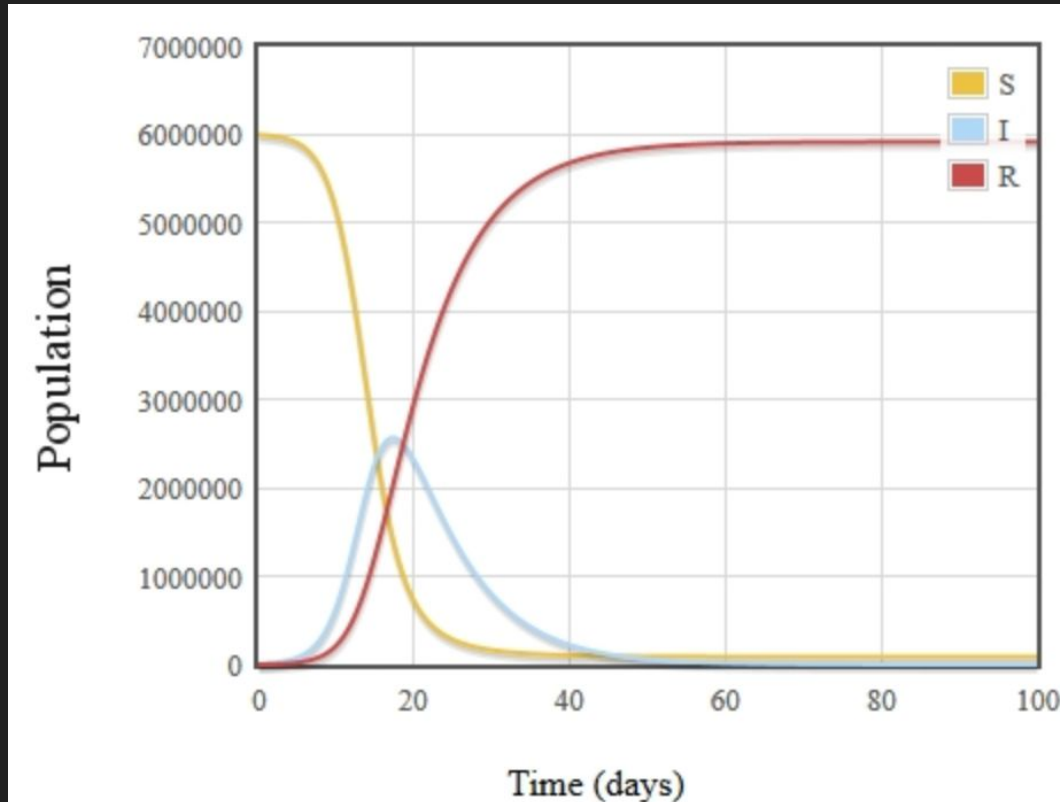
- Occurred December 2013 - June 2016
- 11,310 total deaths

What is Epidemiology and How Does it Help?

Epidemiology: The study of infectious disease and how it spreads within a population.

- Epidemiologists generate mathematical models to show the spread of infectious disease.
- These models can be used to predict the best time to vaccinate against infectious diseases.
- Proper timing is imperative to prevent the spread of infection.

SIR Model for Ebola



Our Client

Dr. Joseph Mihaljevic:

- Assistant professor in SICCS
- Researches and collects data concerning the spread of infectious disease
- Primary focus:
 - Ecological preservation through biocontrol
 - Controlling outbreaks of infectious disease

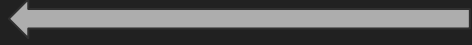
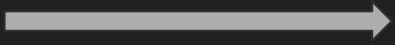


Problems

The current methodology lacks unity:

- Epidemiologists lack an efficient way to share their models
- These models can only appear in static form
- Discussion with the entire community only begins at publication
- Allowing other epidemiologists to use their code is dangerous in research.

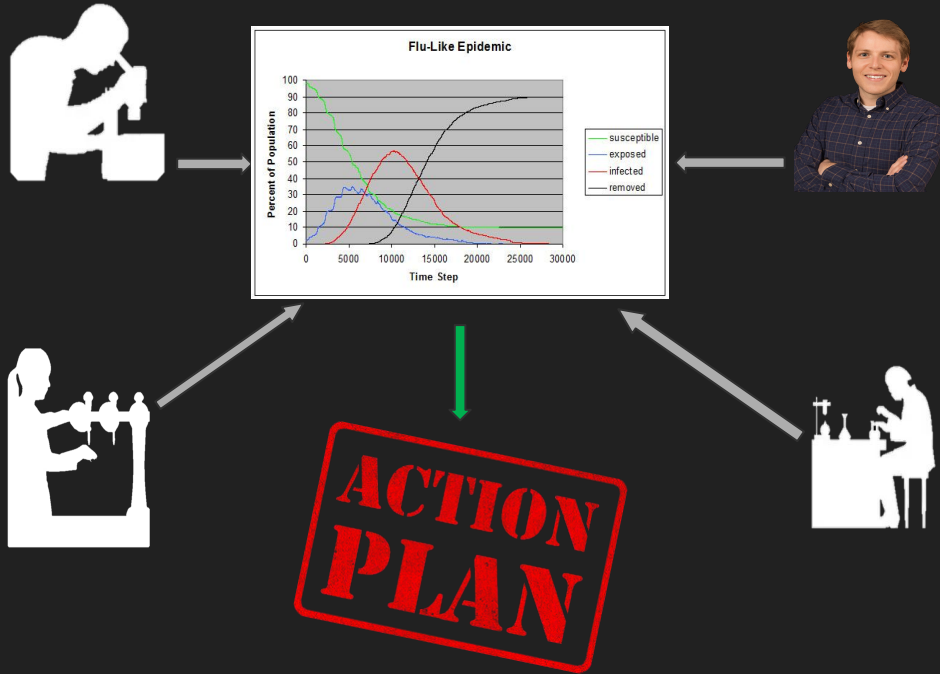
Modeling in Reality



**ACTION
PLAN**



EON: Epidemic Observation Network



EON will allow epidemiologists to:

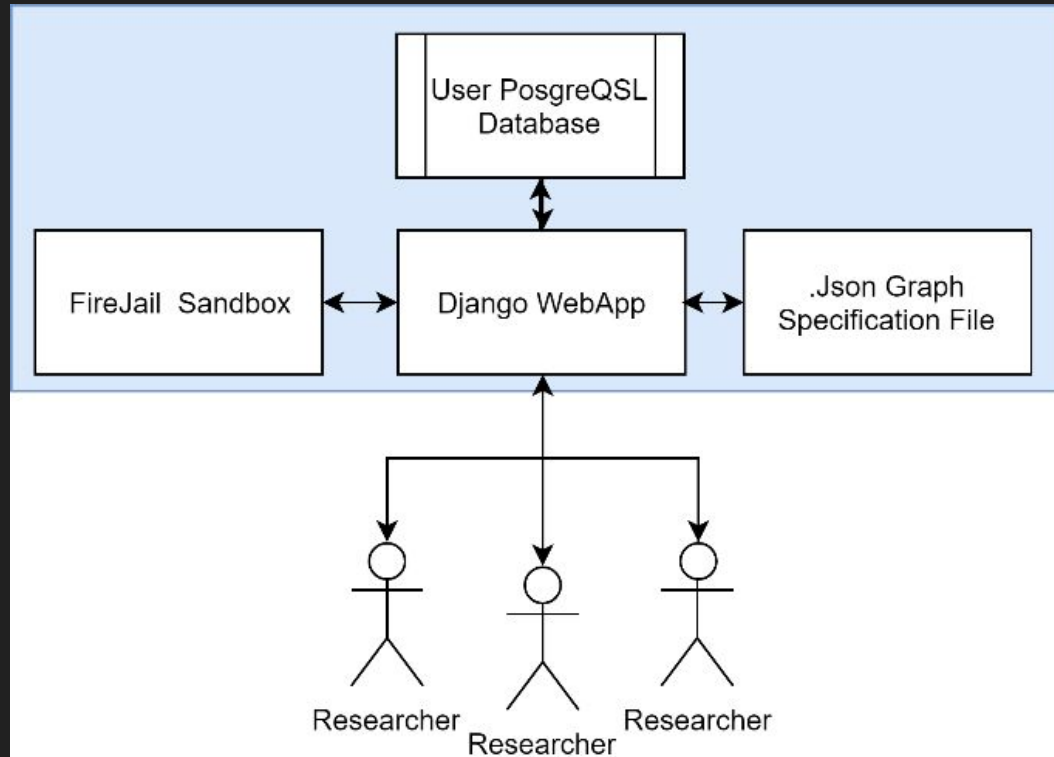
- Share models with the community
- Decide how their models appear to viewers
- Interact with and provide feedback on other models
- Discuss future models without a model fully developed yet
- Edit and share the code used to generate models

Key Requirements

Acquired through numerous client meetings.

- User accounts and management
- Allow users to upload custom models
- Allow a user to make these models public or private
- Allow users to run/explore uploaded models
- Support cloning, modification, and sharing of models
- Support multiple modeling languages
- Ability to extend with new languages
- Forum for the discussion of models

EON System Solution Diagram

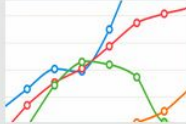


Prototype Review



- Home
- Users
- Forums
- Models
- Groups

testuser's Profile



About testuser:

Name : Joe Eppinger

Email: joesemail@email.com

Biography: hey me joe

Affiliation: No Affiliation

Prototype Review



[Home](#)

[Users](#)

[Forums](#)

[Models](#)

[Groups](#)

Group Name: JoesGroup

About: A group

Members: [Edit Member Privileges](#)

joe [view](#)

Invite Friends:

No Friends outside the group found!!

Join Group Requests: [Search for users to Invite](#)

Prototype Review



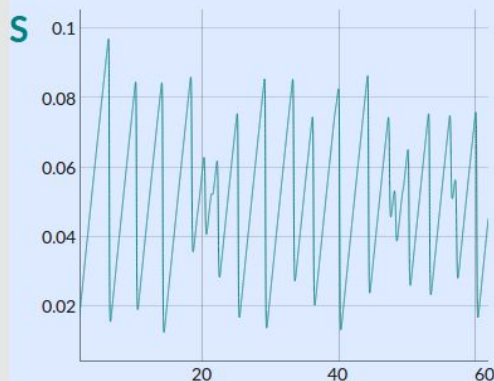
Home

Users

Forums

Models

Groups



nyear **110.81532875**

beta1 **0.297299385**

Submit

Thread Name: Seasonal_SIR

Author: testuser

Posted at: April 4, 2019, 11:40 a.m.

Auto generated first post for model: Seasonal SIR

Prototype Review

Home
Users
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Thread Name: Seasonal_SIR

Author: joe

Posted at: April 2, 2019, 11:17 a.m.

Auto generated first post for model: Seasonal_SIR

Posted by: joe
Created at: April 11, 2019, 12:07 p.m.

Great model!!

Reply

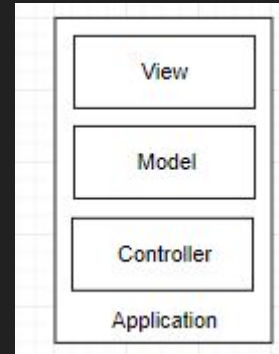
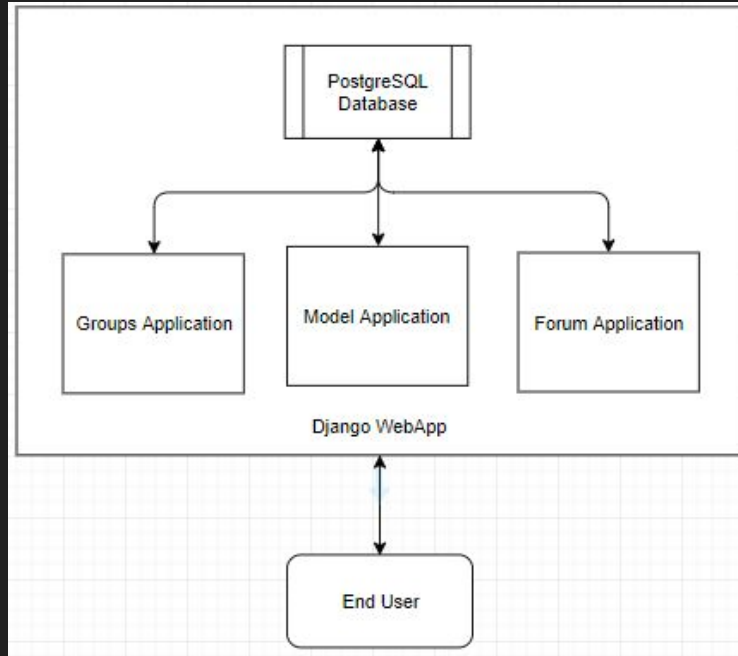
Posted by: joe
Created at: April 11, 2019, 12:08 p.m.

agreed!

Reply

B I U S   |        |     
Style - | Format - | Font - | Size - |   | ? | 

Django applications



Testing Plan

Unit Testing,

Validate the View, Model, and Controller for each individual Django application.

Integration Testing,

Ensuring proper functions requiring multiple applications.

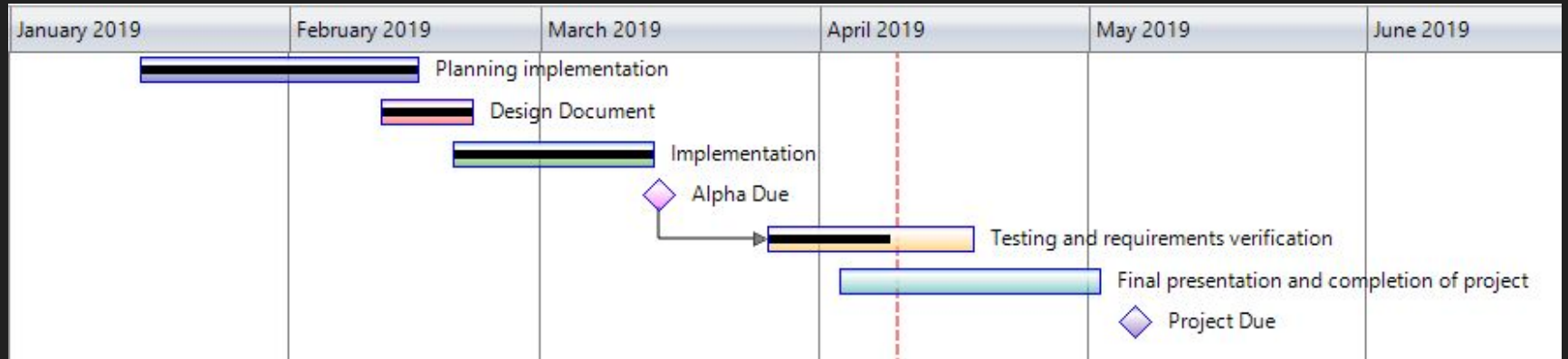
Usability Testing,

Evaluate the ease of use.

Risks/Feasibility

Risk	Severity	Likelihood
Individuals uploading/downloading malicious code	High	Low → None
User's programming language not supported	Medium	Medium → Low
Server overloaded with running models	Medium	Low
Difficult entry: New users may find the platform challenging to use	High	Medium → Low
Users wish to maintain IP rights to code	Medium/High	Medium → Low
Singular point of reference	High	High → Low

Future Plans



Conclusion

- Epidemiology is important when it comes to lessening the number of deaths due to infectious disease
- EON will speed up and optimize the current workflow
- Thus our application will be invaluable for assisting epidemiologists in their future endeavours

Current Progress - Homepage



[Dashboard](#)

[Users](#)

[Forums](#)

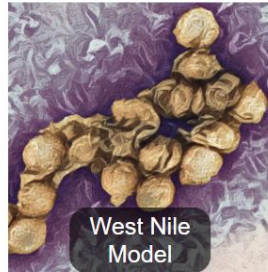
[Models](#)

EON

Cool tag line

The short description (or shortdesc) is arguably the most important component of a DITA topic, and is also one of the most difficult elements to write. Short descriptions should be written for every topic. Short descriptions serve multiple purposes within a document.

Popular Models:



Current Status – Forums



[Dashboard](#)

[Users](#)

[Forums](#)

[Models](#)

General Discussion

22

votes

New Ebola Model

I have created a new model for Ebola as it spreads through densely populated areas...

9

comments

Human

Virus

6 mins ago



user6490375

77

55

votes

Looking For Data On Xylella Fastidiosa

Does anyone have a sample I can use for a new model I can use for bacteria infecting...

14

comments

Bacteria

Oak

11 mins ago



Croolman

115

38

votes

Any Updates On This Data?

I saw an incomplete data sample a few weeks ago here. The thread has been locked...

8

comments

Virus

Moth

16 mins ago



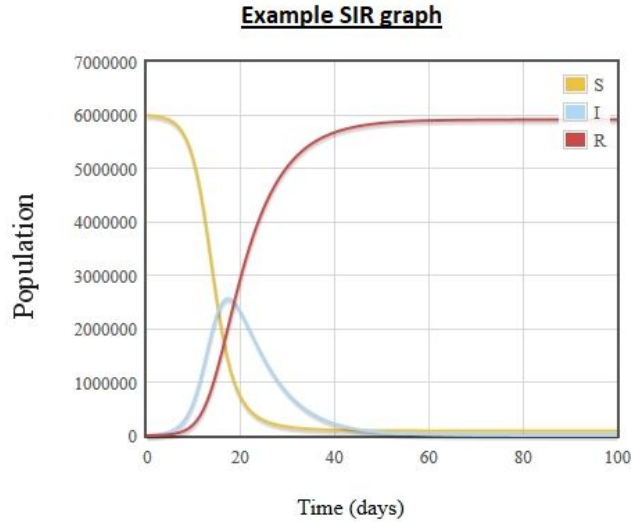
cl40

11

Current Status - Models

- Dashboard
- Users
- Forums
- Models

Read Me L1 Error L2 Error **Example SIR graph**



Modifiable Parameters

Range Range: (100 -1K)

800

Alpha Range: (1 - 5)

4

Distribution Range: (1 - 10)

1.5

Infectivity Range: (10 - 100)

30

#Tags #KNN #CoolModel Last Day Edited: Today

 **Model Smasher**

Filter by:

EON an In-depth View the Model application

