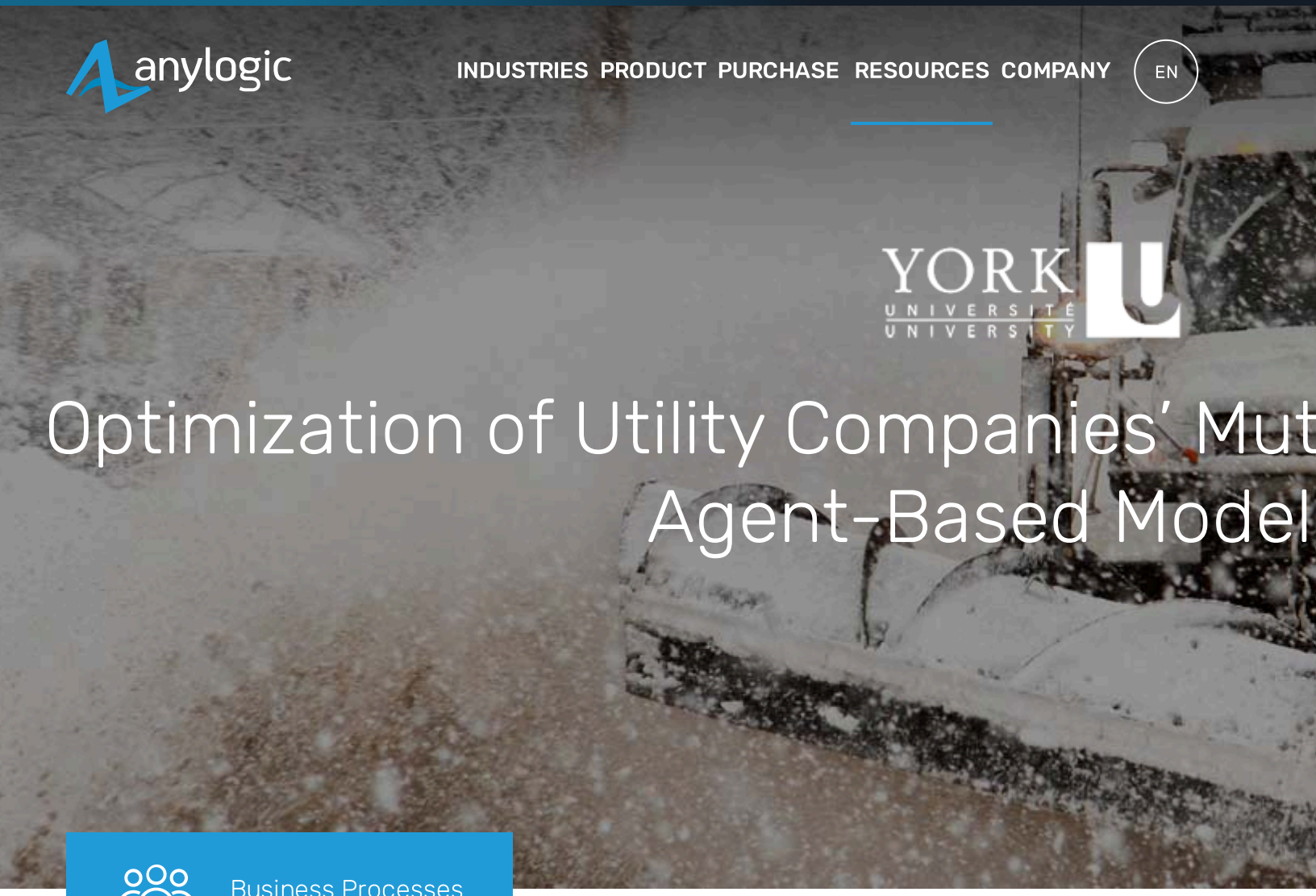


Optimization of Utility Companies' Mut
Agent-Based Model

Business Processes

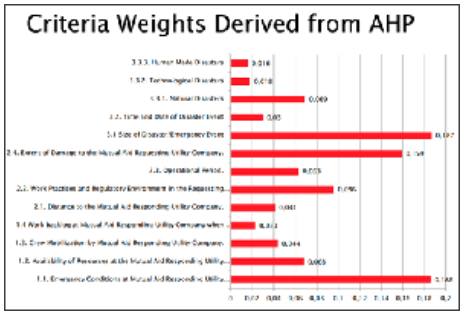
Problem

When people are impacted by a natural or man-made disaster, utility companies look for ways to provide resources as soon as possible, and reduce outage time. To assist and better coordinate with each other, Canadian companies from closely located territories created alignments. So, if a disaster happens, and a local utility company does not have enough resources

decision-making tool for managing the process of mutual assistance.

Solution

To identify the criteria that contribute to decision making, industry specialists were interviewed. Overall, 13 criteria were chosen and then grouped into 3 categories:



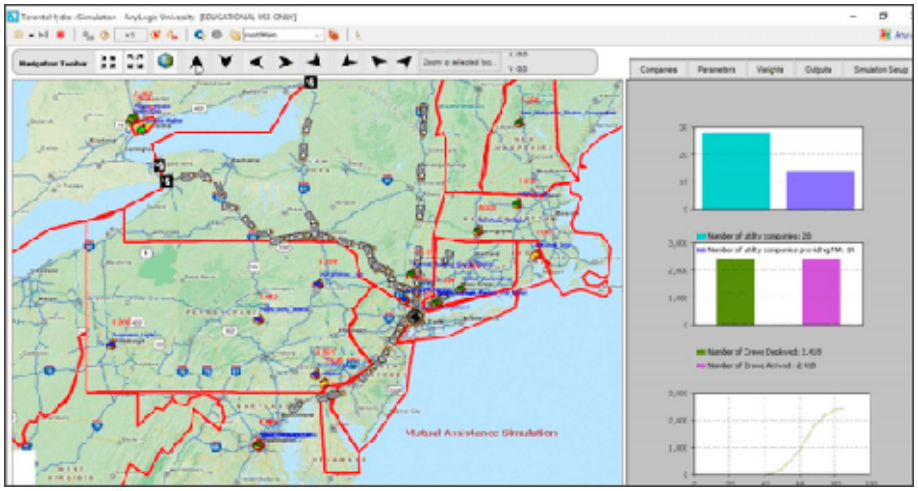
- Mutual aid requesting criteria - including distance to emergency site, extent of damage, etc.
- Mutual aid responding criteria - including emergency conditions in own region, availability of resources, etc.
- Disaster criteria - including size of disaster, disaster type, etc.

Criteria were assigned with numerical values and weights, showing the importance of a parameter in a particular situation.

An agent-based simulation model was designed to test various mutual aid scenarios. The model's interface allowed users to choose agents, acting as requesting and responding companies, which would then be marked in GIS space. It was also possible to set weight and value for each criterion.

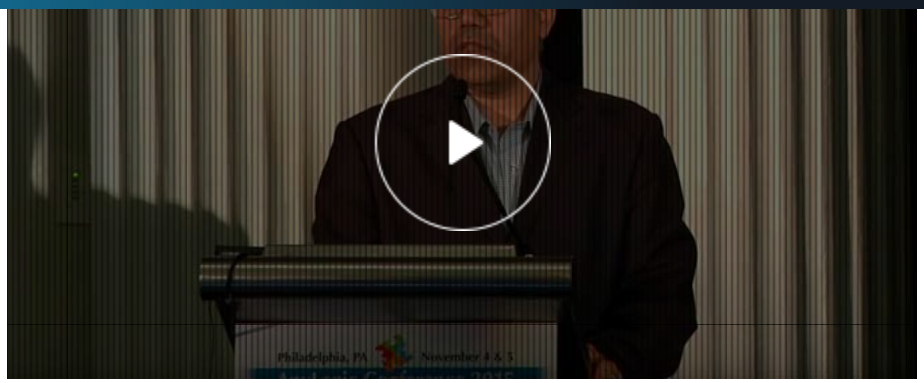
This state chart of a utility company shows the decision-making process when a responding company gets a call from a requesting company. To decide whether the help could be provided, the model's algorithm calculates the score, based on preset values and weights of criteria.

When the decision is made, the crews of the responding companies start moving to the place of emergency. While in route, the crews may be distributed among several places of emergency. At the same time, it is possible to see the following outputs:



Outcome

AnyLogic simulation modeling helped develop a tool for better planning, according to which mutual assistance might be recommended. Simulation modeling made it possible to optimize the mutual assistance process by running various experiments and avoiding mistakes in the decision-making process. GIS capabilities allowed users to visualize the routing of utility companies' crews and redirect them if needed.



Similar case studies

MORE CASE STUDIES

DOWNLOAD