Simulation of Volunteer Task Assignments as Characterized by Organizational Support Values

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RESEARCH OBJECTIVES

To create a computer simulation for volunteer task assignments characterized by organizational support needs

- To study the effect of organizational support on the rate of depreciation over several years
- To see what companies generally accept as an average amount of organizational support
- To study the average amount of years until an organization is unstable based on certain parameters

BACKGROUND

In 2016, the volunteer rate declined by 4% (Bureau of Labor Statistics, 2016). This is becoming a growing issue because many non-profit organizations are having to start to pay volunteers as employees for them to help them, which is not economically viable in the long run. Recently, the concept of organizational support has become a big factor in the decision for many volunteers to either join a company or return to a company Organizational support is the degree to which employees (volunteers) believe that their organization values their contributions, cares about their well-being and fulfills socioemotional needs (Harkin & Lingo, 2019). Organizational support is generally thought to be the organization's contribution to a positive dynamic with employees, as employees tend to perform better to reciprocate received rewards and favorable treatment (Harkin & Lingo, 2019). With many volunteers having bad experiences or not liking the job they were assigned, they tend to drift away because they no longer receive the same satisfaction of helping others (Harkin & Lingo, 2019). Volunteers bring a distinct set of interests and needs to organizations that guide their actions within the organizations, influence their satisfaction, and predict their intentions (Pauline, 2013). The necessity for companies to realize this and be able to support and tend to their employees' basic needs is very important (Retracted, 2019). The software, Arena, is a simulation software is used to simulate real life events such as this volunteering scenario. The software is generally used by corporations as well as students. This simulation can be used by employees and corporates of organizations to see what situations would be the most optimal to optimize the retention of their volunteers.

METHODS

Sample Statistics

Organizational Support Values are Standardly Deviated	If the Volunteer is Supported, they have about a 92% Chance of Retention	If the Volunteer is not Supported, they have about a 42% Chance of Retention
Volunteers Organizational Support gets approved is 1-((O.S/10)-0.1)	There is a 60% chance a volunteer can go from an Easier Job to a Harder Job	There is a 90% chance a volunteer can go from a Harder Job to an Easier Job

Assumptions

The Average Organizational Support Value for Volunteers is 5	A Volunteers Organizational Support Value Can Change by ±1	After The First Year No New Volunteers Enter Through the Simulation

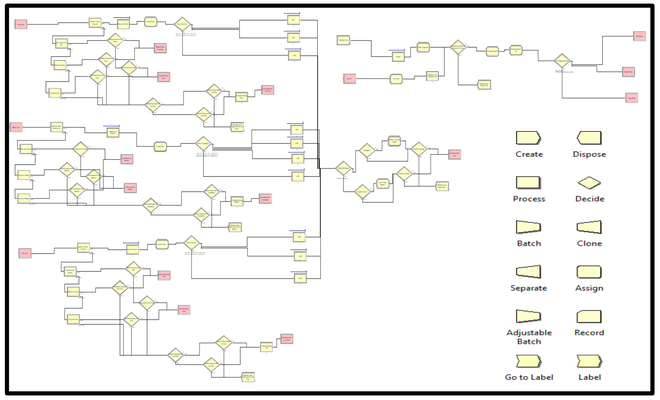

Figure 1: Volunteer Simulation on Arena Simulation Software

METHODS CONTINUED

1. Based on the gathered information create a detailed algorithm, incorporating all the previous statistics and gained information from the non-profits. Will be created with in person survey results as well as statistics found on online databases
   a. Process for making the algorithm
      i. Need to turn the data received from non-profits into numerical values
      ii. Understand the importance of this factor and create a multiplier (scalability) that will be the coefficient of this variable
2. Gather a laptop/computer and download the student version of the Arena Simulation Software Learn the Arena Software API through the same website in the previous link
   a. Topics of Interest (Main Modules used):
3. Create a flow chart of what you want your actual simulation to look like
   a. Make it as generic as possible so that you can easily implement in any simulation software

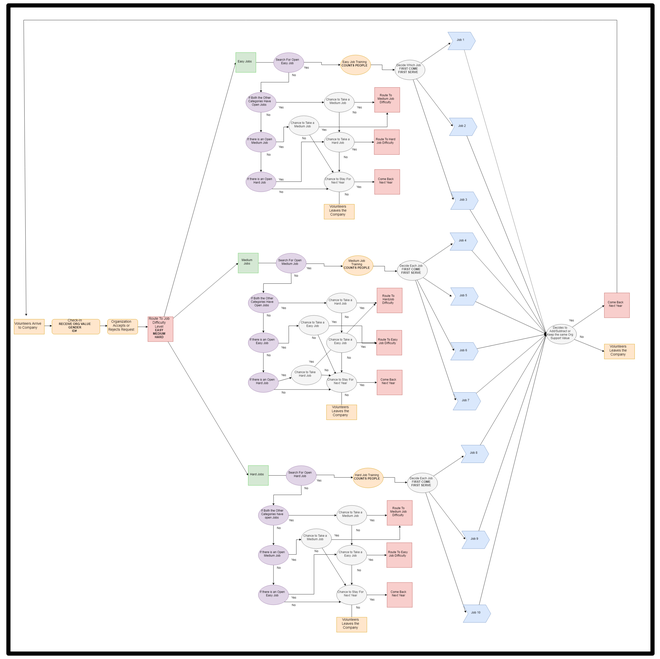

Figure 2: Flowchart of Volunteer Simulation

PRELIMINARY RESULTS

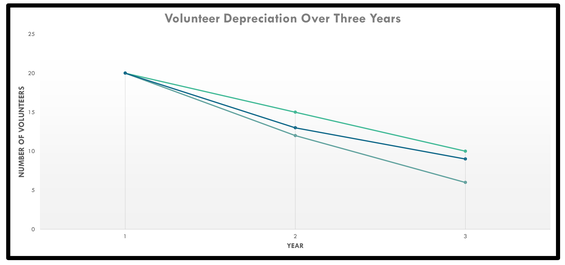

Figure 3: Graph of Volunteer Depreciation

The line plot above shows consistent data across the three trials of the simulation describing the volunteer rate of depreciation. As years pass, the amount of volunteers in the company decrease at a relative linear rate. Through 100 runs of this simulation there was an average rate of depreciation of 5.3 volunteers per year.

PRELIMINARY RESULTS CONTINUED

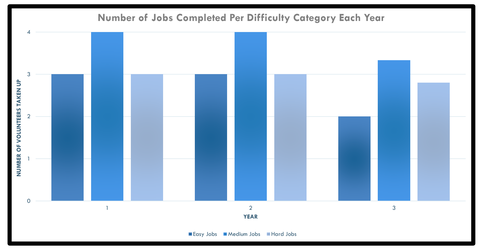

Figure 4: Graph of Job Distribution Over Three Years

The bar graph above shows the average number of jobs completed in each difficulty category per year. In the first two years of the simulation on average all the jobs get completed. Although when the simulation reaches the third year the average amount of volunteers per jobs tend to decrease, especially for the easy difficulty.

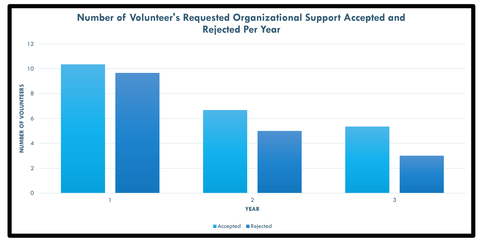

Figure 5: Graph of Volunteer's Organizational Support Values Accepted and Rejected

The bar graph above shows the average number of volunteers that got their organizational support needs accepted and rejected. Over the years as the amount of volunteers decline in the company the number of acceptances decline, as well. Over all three years of the simulation, on average, the amount of volunteers that were accepted was more than those that were rejected.

CONCLUSIONS & FUTURE DIRECTIONS

There was a steady depreciation in volunteers after the end of each simulation

- At the end of the third year there was an average of 8.33 volunteers left in the program. In my simulation, with a total of 10 jobs , there wouldn't have been enough volunteers to complete the jobs
- Between the first and second year, there was an average loss of 6.66 volunteers, while between the second and third year there was only a loss of 5 volunteers. If the program were to be run for multiple more years, the graph would begin to resemble an exponential curve as there are less volunteers available to leave the program.

During the first two years of the simulation, all the jobs were able to be completed , although some jobs in the third year were not able to be completed

- The easy jobs had the lowest total job completion rate with an average of 1 less job being completed in the third year of the company. Generally a company would have to bring in either an employee to completed the designated task or they'd be forced to search for a new volunteer for the year.

Through the three-year time span the amount of volunteers that got their organizational support value approved turned out to be more than those that got rejected.

- As the years progressed, the difference in accepted to rejected tended to increase. The volunteers with a lower organizational support value tended to enjoy and stay with the company, which is why there were more getting accept later on compared to the early years.

In the future, I would plan to add more restrictions to the simulation. Currently the only factor considered is the organizational support value, while there are other factors in the retention aspect such as group integration, empowerment, and participation of employees. Another aspect that would make my simulation more accurate is that I could include a random factor into my simulation with the chance of a new volunteer joining every year. On top of this, I hope to incorporate my simulation into the full-access version of the software. With the current software, I couldn't get all the data I hoped to gain as it was a free student version which didn't allow access to all the features.

REFERENCES/ACKNOLEDGMENTS

Thanks To Safron Smith, Dr. Jennifer Pazour and the Department of Industrial & Systems Engineering at RPI

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