

**DEVELOPING MODELS TO PREDICT GIVING BEHAVIOR OF NONPROFIT
DONORS**

THE ROLE OF TECHNOLOGY FOR FUNDRAISING IN THE NONPROFIT SECTOR

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
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Bachelor of Science in Engineering Systems and Environment

By

Shawn Weigand

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SOCIOTECHNICAL SYNTHESIS

In the nonprofit sector, data analysis allows organizations to build deeper personal connections to best serve those in need. The technical report uses The Children's Inn at the National Institute of Health as an example of how data analysis of a nonprofit's donor base can lead to more fruitful fundraising endeavors. The Children's Inn will be able to narrow their scope of donors to target those that will be the most generous. They will also open up more time to build out those relationships as well as relationships with the families being served. The STS research paper explores the ability of data analysis to both connect actors within the nonprofit sector and allow for more efficient operations through information technology. The discoveries made within the STS paper can be recommended to The Children's Inn for implementation in the future.

The goal of the technical report is to identify key attributes of potential high-level donors that The Children's Inn can direct their resources towards. Another goal is to use those attributes to diversify the community of donors within The Inn. By analyzing profile and transactional data, these goals can be achieved while allowing The Inn to spend more time building relationships with donors and service recipients. A number of models are being developed in alignment with these goals as a method to analyze their data.

In the technical report, a model utilizing recency, frequency, and monetary donation metrics was built to map donors and how they transition to higher or lower states of giving. A classification and regression tree model was built to uncover the significant demographics involved in determining whether a constituent will donate or not. Geographical data shows the locations to which a majority of donations are being received from. The end result will consist of

a list of targeted donors to give to The Inn that will provide larger funds and a new level of diversification. The models will then be handed off to The Inn for them to use again in the future.

The research question being addressed through the STS report investigates how nonprofits can effectively raise funds in order to afford the expenses involved with preparing new IT systems. The thesis statement explains that data analysis can be used as a tool to raise funds in an efficient manner. Data analysis not only improves the giving of individuals to an organization, but also improves the communications between all actors within the nonprofit sector. The thesis statement was proven using actor network theory and describing the data solutions.

Some of the data solutions that were explored include model building, data mining, donor segmentation, database access and customer relationship management systems. These solutions will allow organizations to raise more funds, which can be used to implement IT systems or to funnel back into improving the data analytics. Besides serving those in need, the funds can also be used to hire experts, train staff, collect data, purchase data and purchase analytic reports. Data analytics can then be used by individuals and funding intermediaries to find nonprofit organizations that support their causes of interest. Nonprofits use data and databases to discover the constituents who are most likely to give and engage, and the individuals who are in need of assistance the most.

Data analytics can seem like a large investment for nonprofits to make without directly serving those in need, but the STS paper and technical report aim to prove otherwise. Not only will data endeavors increase the overall number and value of donations, but it will also help to engage new donors with a more diverse background who are more likely to be invested in the cause. With funds not being as scarce, nonprofits can spend more time building relationships with the people they serve.

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STS advisor: Catherine D. Baritaud, Department of Engineering and Society

PROSPECTUS

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