

Thesis Project Portfolio

Implement By-Name Databases to Resolve Homelessness in Charlottesville Virginia

(Technical Report)

**Understanding the Unhoused's Attitudes Towards Large Technological Institutions for
Purpose of Implementing a By-Name Database**

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

Last summer I spent my weekends at The Haven day shelter, interviewing people experiencing homelessness for a media project. The media project was ultimately never released, but the experience showed me the harsh reality that the vulnerable people in our country face on a daily basis. I became deeply interested in understanding the problem of homelessness and how to solve it. In my research I came across the work of Rosanne Haggarty of the non-profit Community Solutions. She proposed a technology based solution to homelessness called the By-Name Database. I found that her reasoning for this technological infrastructure was sound and was especially of interest to me as a Computer Science major. Thus, for my technical capstone I resolved to find how the techniques I learned in my university education could be applied to the problem of implementing the By-Name Database. Furthermore, for my STS Research Project I investigated how to overcome the cultural and organizational barriers of instituting the By-Name Database.

My technical capstone produced a research paper that outlined how the concepts from the class CS 4750 Databases could be used to implement the By-Name Database. The requirements for the By-Name Database, as outlined by Haggerty, include that it must be secure, must be accessible to anyone in the community who touches upon homelessness – housing authorities, non-profits, welfare offices, hospitals, the police, etc. – and must include any piece of information that may be useful to resolving a person's homelessness – medical history, mental health status, substance addictions, programs they qualify for, etc. My technical capstone showed how the database management language SQL could be used to organize homelessness information as well as some sample commands that might be especially useful. Furthermore, it

showed how the security concepts, such as SQL injections and salting and hashing passwords, taught within CS 4750 would be necessary to securing the database.

My STS research project investigated the cultural and organizational barriers of instituting the By-Name Database, specifically the barriers that may be involved with convincing the unhoused individuals to give up their private information. This would be a significant barrier, both because the By-Name Database requires accurate information and because it should not be taken for granted that unhoused individuals would give up their information easily. By analyzing the long form interviews I collected from the original Haven media project, I found that unhoused individuals are naturally distrustful of large institutions, because frequently in the past they have been mistreated and abused by them. However, I also found that unhoused individuals have practical needs that need to be addressed. I concluded that the best way to pitch the By-Name Database was to explain how it would address these practical needs.

By doing these two projects I learned that to implement a solution requires several factors to come together. I found that Mesthene's triangle model of implementing solutions to be accurate. For a solution to be fully implemented, it needs to be implemented on the technical, cultural, and organizational level. None of these factors are simple. For instance, my technical capstone just scratched the surface of what would be required to create the By-Name Database. Furthermore, my STS Research Project shows that a question like "will people add their information to the database" requires thought and strategy. It is the duty of the engineer to be well balanced in addressing not only the technical, but also the cultural and organizational problems.