

Development of a Resident Management System for Georgia's Healing House

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ABSTRACT

There are various nonprofit organizations in and around Charlottesville that do honorable work by providing free services for those who need it in the community. Many of these organizations rely on outside funding in order to keep their operations running. Georgia's Healing House (GHH), an organization that provides a structured living environment for women recovering from substance abuse, falls into this category. For GHH, funding is provided when the organization can prove its effectiveness in the successful recovery of its residents, as well as in the daily operations at the house. However, the board of directors of GHH want hard evidence of the organization's efficacy. Our capstone project, a resident management system for GHH, provides this evidence in the form of aggregate reports that summarize resident recovery, house activity, and demographics. Our system allows users to enter data points about residents through the use of simple forms and generate reports with the click of a button. Not only does the system provide GHH with a tool for efficient and consistent data entry, but it also allows the organization to leave behind its paper-based system which proved to be tedious and prone to data holes.

1 INTRODUCTION

Georgia's Healing House is a nonprofit organization based in Charlottesville that provides a structured living environment for women recovering from substance abuse. The house requires that its residents be willing to participate in the development of an individualized

treatment plan, seek and maintain employment upon entry, and follow all of the house rules. After eleven years of operation, Georgia's developed a need to aggregate data on resident activity and recovery whilst in the house into reports. These reports were to be presented to a board of directors to secure future funding for the residence by showing concrete evidence of its successful operation and benefits towards resident recovery. Our application solves Georgia's problem in that, it is an automated tool the house's staff can use to record and aggregate resident data in a simple and efficient way.

Prior to the development of our resident management system, Georgia's collected information in a paper-based fashion. The organization used several forms that were multiple pages in length and some forms which seemed to contain no useful fields at all to track its residents. A staff member would need to set aside several hours to complete all of the forms correctly and thoroughly for a single resident. Since Georgia's keeps around 12 residents at any given time, data collection eventually became tedious and inefficient. The lengthy form filling process ultimately led to sloppy data collection and prevented Georgia's from being able to have an accurate overview of the house's daily operations and resident activity.

Our resident management system solves Georgia's problem by allowing admin staff members to efficiently store, edit, and manage resident data and also by eliminating many of the problems that arise with paper-based systems. in an automated and non-cluttered manner. Georgia's will no longer need to keep multiple

filing cabinets worth of applications and other forms, for the system stores this information digitally in a relational database. There will also no longer be any data holes because the forms included in the system provide no way around filling out vital information in the forms. The electronic storage of resident information will not only allow Georgia's Healing House to aggregate its data more efficiently, but also allow it to present its reports to the board of directors confidently and without any fear of inaccuracies.

2 BACKGROUND

The software we developed for Georgia's Healing House is a resident management system. The purpose of the system is to allow its users to enter, edit, and manage information about residents and then allow the aggregation of this data into reports that summarize resident recovery and activity within the healing house.

There are two levels of user privileges for the management system: administrative and staff. There was heavy emphasis from our client on not allowing staff users to delete any resident or staff information from the system. Therefore, admin users have universal access to all aspects of the system, while staff users are only allowed to enter and edit resident and donation information. There are only be two to three admin users for the entire system to ensure resident information remains as confidential as possible.

Our system was implemented using Django, a free and open-source web framework which follows the model-view-template (MVT) architectural pattern. Our group chose to use Django not only because Python is an easily readable language and we all had prior experience using the framework, but also because Django has an abundance of documentation online and is simple enough so that someone working on the system in the future could understand the system and easily make changes.

Our system is deployed on Amazon Web Services (AWS) as requested by the customer. Our client preferred AWS deployment to other options due to pricing and security. Amazon takes a reasonable approach to pricing its hosting when launching AWS. The service is "a la carte", meaning you pay for what you use. This pricing is perfect for Georgia's system because the server will be only be used highly once a month and the organization's budget is limited. Access to AWS resources can be restricted using the Identity and Access Management (IAM) feature. Using

the roles in IAM, Georgia's can define the privileges of user actions which greatly reduces any malpractice.

3 RELATED WORK

Similar designs of our system can be seen in the majority of human resource softwares. Human resources software needs to track employees from the application phase all the way to termination similar to how our software tracks residents. Furthermore, reports need to be generated on potential employees each step of the process as well as timely reports on employees. However, there are differences in the contents and usage of the system. The main difference is that employees use human resource software to update their taxes, benefits and other pieces of data whereas for our system, everything is entered in by a staff member. Furthermore, human resource software is more focused on managing employees while the software we developed is more about record keeping. The price of human resource software varies greatly depending on the complexity of the desired software as well as the size of the company. In the case of Georgia's Healing House, the required software does not need to be too complex and the number of residents will stay relatively low. An estimate of basic software for a small company is roughly \$40 a person or even \$1,000 for a software package. This is in addition to the maintenance fees that go into keeping the website running which range from \$5 to \$10 per user per month. Most of these softwares are custom written by private companies that contract their software out to other companies. After selling their system, the developers need to update and maintain the software to keep their customers happy.

Georgia's Healing House chose to hire us instead of buying a similar type of existing system due to the monetary constraints. As a non-profit, cutting costs is crucial to keeping the organization running. The record keeping that the Georgia's Healing House staff need is rather basic and does not require any of the advanced functions or features that existing systems have. Furthermore, by contracting us to create the software, the customer is able to specify exactly which functionalities Georgia's needs. This level of flexibility is not available when buying existing software without incurring significant additional fees.

4 SYSTEM DESIGN

The final system design is comprised of two Django app tiers: georgias and residents. This organization of the code base allowed us to more effectively divide the functionalities available to different users of the site, primarily staff and regular visitors.

The georgias app contains all of the code and data related with the front-facing interface and functionality. The models of this app consist of the User Profile, Volunteer Hours, and Donor Information, which are all available to be added and edited via the views of the georgias app. All of these functionalities are what are supposed to be available for unregistered users of the site. They include recording volunteer hours, registering donor information, and directing users to their GoFundMe page. This design is so that non-staff users cannot access sensitive information about residents.

The residents app contains all the functionalities related to a resident in the data management system. This includes all the information and forms used created and edited by authorized staff members of Georgia's Healing House. All of the views contained in this app required login to use, and some more critical functionalities (e.g. deleting resident records, disabling staff members) require an administrator permissions.

One of the most significant problems that we had to factor into the system is the workflow of every resident related to the house, from the moment that their application is submitted until their stay is terminated for any number of reasons. With collaboration with the customer, a resident workflow was established with seven discrete steps: Create Applicant, Create Interview, Accept/Deny, Resident Intake, Monthly Reports, Critical Incidents, and Discharge. All of these records are saved on each resident, and are all viewable under the "Residents Report" tab for administrators and staff. The following will delineate the details of each workflow stage.

The first workflow stage, Create Applicant, involves submitting the initial information about the potential resident. This includes demographic information, permanent address, and motivations for staying at the house. This stage vets any resident who is not qualified, which could be for many reasons (i.e. not a resident of Charlottesville, committed certain felonies), and collects relevant data on who is applying to Georgia's Healing

House. If the resident is terminated at this stage, a termination form is generated and the reasoning is listed. If the application is accepted, the resident moves onto the Create Interview stage.

The Create Interview stage first displays all application data from previous stage that is relevant to the corresponding applicant. The interviewer can choose to accept the applicant and move onto the interview, or deny the applicant and submit a termination form explaining why. The interview form collects more in depth information about the applicant, from their past relationships and drug abuse to the type of medical treatment they are receiving now, if any. This stage of the interview is more detailed due to this being the last stage of vetting before the applicant is accepted or denied from Georgia's Healing House. After the interview has been conducted, the applicant moves onto the Accept or Deny stage. This stage displays all the information from the previous Create Interview stage. If the staff chooses to accept the applicant, the resident is added to the list of active residents in the house. If they resident is denied, a termination form is generated, and an explanation as to why is required.

The following three stages (Resident Intake, Monthly Reports, and Critical Incidents) all happen when the resident is active in Georgia's Healing House. The Resident Intake stage takes in all the information needed about the resident when they first move into the house. This includes the date of arrival and the assigned mentor for the resident, who helps the resident track their progress during their stay. The Monthly Report stage is iterated monthly, and involves collecting information about the residents the progress they have been making during that period of time. The data recorded included the number of Alcoholics Anonymous and Narcotics Anonymous meetings attended, employment information, critical incidents, and community program involvement. These reports are done in conjunction with the assigned mentor. The Critical Incident stage is encountered when the resident commits a violation of the House rules. This includes alcohol and drug use, physical altercations, theft, and abandonment of the house. An explanation of the situation by a staff member of the house is given, and these reports are included in the Monthly Reports stage.

The final resident workflow stage is completed when the resident finishes the program, regardless of

whether they were successful or unsuccessful. This stage requires a staff member to provide a reason when they are leaving, and the plan the resident has after leaving the house. While the resident is added to the Terminated Residents group, their previous reports are retained within the database and accessible through the system. This information will give the stakeholders of the system a better insight on who is staying at the house, what is effective about the program, and how to improve certain parts of the resident workflow.

5 PROCEDURE

Initially, our system aimed to be used by the entirety of the staff at Georgia's Healing House including the administrators, staff and other volunteers. However, due to changing circumstances, the customer will be the main and sole user of the system for the initial few months until the organization is more comfortable with integrating it into their daily workflow. Our client, who rarely visits the house, will be using the system as a data repository. He will be going to the house to collect the data that exists in paper form and entering it into the web application as a starting point. After creating all of the resident entries and other corresponding entries, the client will be going by the house every so often to collect the data that will still be amassed in paper form and entering it into the system.

After the initial testing period has passed over, a transition period to train the staff at Georgia's Healing House will commence. During this time, our client will be working with the staff members at the house to move them over to keeping documentation on the web application. This will mostly consist of our client ensuring the paper documents being entered into the system every day or every week by the staff. As the staff becomes more comfortable with the process and realize the benefits of the system, they will be further eased into solely using the web application and eliminating any paper components.

Moving past how the system as a whole will be used within the organization, on a day to day basis, after full transition to the staff, the system will take on book keeping duties that were previously being done on paper. This includes functionality such as aiding staff in creating an application when a potential resident comes in looking for help, filling out an interview form with notes when determining if the application truly belongs in the house, and tracking activity of the resident throughout their life

within the house. At this scope, our client will not be interacting with the system, only the other stakeholders — the staff members at Georgia's Healing House.

The customer comes into play when viewing the system as a data repository as opposed to a workflow aid. Our client will only be pulling data from the system for analytical and reporting purposes. He will be interested in statistics such as drug of choice and race of women moving through the process. These statistics will then be aggregated for use at the organizational level when presenting to the board of the house or other higher ups to secure funding or other benefits. Day to day operational data will not be of concern to him.

6 RESULTS

The problem being solved through the creation of our system is a transition away from disorganized and slow methods of data recording and aggregation into a more streamlined process. Through the application of our system to the process at Georgia's Healing House, we have improved the efficiency of the aforementioned functions. While the recording aspect may not have been drastically improved, there are still some notable upgrades. First, as opposed to using paper to record, typing into a form can be two or more times as fast depending on the user. Since typing speeds are generally faster, this allows the interviewer to record more data and details of the interviewee. This will result in approximately a 60% decrease in time necessary to submit and file forms necessary for each resident. Furthermore, having digitized all of their interview and application forms, their process of accepting a resident into the house will be approximately 10% faster due to not having to spend time referring to paper records.

The major improvements are shown in the data aggregation and reporting capabilities of the system. Previous to our web application, aggregate data didn't exist beyond our client entering data into a spreadsheet and running functions there. As data is collected throughout the months, aggregate data is actively being kept in the background without a need to go through and run spreadsheet calculations. This resulted in searching and sorting time for forms being decreased from 1-2 hours to a query that takes a 1-2 seconds, effectively a 99% reduction in time spent. Overall, with more data, we are able to produce further detailed reports that may be presented to a

higher body. These reports will be automatically generated, which saves the hassle of having to create a report through aggregating data by hand. The automatic generation of reports will effectively cut down reporting time by approximately 90% as well.

Something that also came as a result of our system was overall data security and data integrity. When data was collected on paper, the only way to ensure data integrity and proper data collection was the discipline of whoever was filling out the paperwork. Now, the system prompts the user to enter the correct data format when something is amiss. Leaving data out or entering wrong data into the wrong field should be much more difficult with the error prevention present in our forms. Furthermore, data being stored on paper can be highly insecure since it can be accessed by anyone with house and office access. The system prevents this. Only users who are provided with a login to the system can see the data and to prevent data destruction, only administrators can edit or delete sensitive data.

7 CONCLUSION

Transitioning Georgia's Healing House to an electronic system has made reporting much more convenient and has transformed the data collected into something more useful to the organization. Previously, Georgia's Healing House depended solely on a filing system to store their data which is highly inefficient and insecure. Now, they are able to get more conclusive information on residents and their progress in the house. These statistics can also be used to gain more supporters as well as donors. They have an efficient way of reporting data and statistics about their residents into a system that can be analyzed to better determine the strengths and weaknesses of the organization's performance. The organization is also now more protected since they have more information about incidents within the house, which will help in the case that the organization has to face a lawsuit.

The amount of time that the organization has to spend on writing data and filing it into folders has been significantly reduced. The organization no longer has to be concerned about losing data since the data will be online and easily accessible by staff members. More efficient and time effective recording can be done on the residents; they no longer have to shift through all of their papers to receive data about a resident or to find their application or

interview form. As the organization becomes more comfortable with technology, they can further develop the system to incorporate more functionality.

8 FUTURE WORK

Due to the challenges in changed requirements, there were some features that were not as detailed and built out in the system. If more time was given, the statistics and aggregation of the data would be further enhanced and more statistics would be generated about the residents. The system currently creates individual resident reports, aggregating all of the meetings, incident reports, employment, and program participation data related to that individual resident into one area. More reports would be incorporated so that the data can be combined to generate statistics of the applicants, interviewees, and terminated residents. The system would create more in depth analysis of the data to create yearly reports as well as other reports. Importing and exporting information would be another focus of the system's future features. The reports, the application and interview forms could be exported as pdfs as well as excel sheets. Importing information from excel sheets would also be another functionality to implement to make populating the system with information more convenient.

The system is lacking some user functionalities, therefore with more time the system settings would also be further developed. Users would be able to be emailed system updates or if there's any announcements, as well as if they have forgotten their password and need to reset their credentials. Further securing the system would be important for future priorities since a lot of sensitive information will be stored on the system.

The user interface can always be further improved and updated to make it more user friendly and make navigation easier. The overall system interface is very simple, design changes can be made to better cater to the user's interface design preferences.

ACKNOWLEDGMENTS

The success of the system would not have been possible without the direction of the Georgia's Healing House staff, particularly Neal Goodloe and Sue Hess. Neal and Sue took the time out of their schedule to meet with us to review the system and help improve it's features.