AFFORDABLE is a volunteer nonprofit organization dedicated to improving community healthcare. Our mission is simple—create one portal, one application, and one database, which will automatically connect individuals to healthcare systems for charity, services, and medical debt. As a result, the network will reduce barriers to healthcare access and improve resource distribution. Here we explain our strategic approach, platform functionality, and modular project proposals. Our goal is for students to approach real world software development challenges to make a positive impact on local communities.
AFFORDABLE - Innovating Access to Healthcare

Mission

Our platform called AFFORDABLE is focused on developing a revolutionary patient-centered online platform which implements a systems based healthcare approach to improving the lives of vulnerable socioeconomic (SE) populations. AFFORDABLE has three primary goals:

1) Simplify the acquisition of resources and financial support for chronically ill and disadvantaged populations

2) Improve resource distribution by enhancing interinstitutional communication

3) Promote small Health-Utilizing Grants (HUGs) to increase financial assistance directed toward improving healthcare outcomes
Systematic Approach

Simplify the acquisition of life improving resources

There are two fundamental properties of a functional healthcare system: quality and accessibility. The current organizational structure of our healthcare system is limiting access to lower SE populations by increasing healthcare costs—a problem we seek to improve with our community based automated digital networking system. Our team is designing a patient centered online platform, called AFFORDABLE, to connect populations in need of healthcare assistance to various sources of support in the nonprofit sector.

Everyone can be served by AFFORDABLE, but a special focus will be on those with substantial medical debt due to chronic illness and lower SE populations with risk factors associated with reduced life expectancy. AFFORDABLE is designed to be intuitive for the limited education level of certain SE populations, but also sophisticated enough to perform intricate time saving functions for organizations and the people they serve. Columbus, OH has been chosen to be an ideal location to launch this software and optimize its functionality due to initial support of local community groups and the city’s demographics match national US demographics. After sufficient beta-testing we can maximize our positive impact on communities around the country as we continue to grow and develop.

Our early platform development model takes a holistic approach to improving health by addressing evidence-based factors that limit healthcare access and compliance including child/elderly care, dietary choices, transportation, etc. The AFFORDABLE network will initially focus on integrating community, religious, and free clinic organizations which will be readily available after registration to our system. From our portal, individuals will be able to automatically apply to the requested programs of these organizations (Schematic 1). AFFORDABLE is set to launch in late 2020 with an initial networking initiative targeted toward the assistance programs of different religious institutions—a conscious decision determined by reduced regulatory burden and need. Initial outreach was positively received, including notable social justice advocate Rev. Timothy Ahrens who agreed to volunteer time to assist networking efforts after development. Many small institutions do not have digitized record systems for their assistance programs or grants and will benefit greatly from our automated system. Our 12-month goal is to integrate 20 of 100 local religious groups in Columbus and start incorporating larger organizations: child day care, geriatric care, free clinics, and battered women support centers. To maximize outreach for this ambitious target, we will assemble community leaders into a Community Integration Council to facilitate this process after AFFORDABLE’s launch.
Schematic 1. Centralized Access Model. Small community groups work independently and use non-digitized management systems to support their community and execute their programs. The burden of accessing the social support falls on individuals to search, qualify, register, apply, and connect for these programs. AFFORDABLE’s basic service bypasses these barriers.

*Improve resource distribution by enhancing interinstitutional communication*

Both small and large institutions are using traditional methods of communication including phone, fax, and paper applications to manage their operations. This includes The Ohio State University Medical Center’s financing and social services department, where the electronic medical records system Epic lacks the necessary application programming interface (API) to address needs outside of the typical insurance payment paradigm. The care of these populations outside of their network requires an explicit coordinated effort, but these institutions provide few resources for this task due to the limited financial incentive. The resulting consequence includes communication errors, unresolved medical debt, and losing people to follow-up. (“Slipping through the safety net”)

To improve the operational management of community services, we have designed an organizational interface for applications. The portal enables groups to target their desired populations and more efficiently address their mission. The portal system (vs. a data export) serves an added benefit of improving private data security, an important factor affecting potential collaboration with organizations acting under the Health Insurance Portability and Accountability Act of 1996 (HIPAA, a cyber security policy regarding personal information). While the portal feature is common among other management systems, the network has the ability to effectively communicate what services are being utilized by members of the community. Real-time updates on applicant assistance among groups that are servicing similar populations ensure accurate reporting by applicants, risk-based resource distribution, and minimize any redundancy or neglect to applicants.

The future development goal of the networking platform is to ultimately integrate the healthcare support systems in the community, include larger healthcare organizations such as hospitals, and financially support institutions that can facilitate debt remediation. With the inclusion of hospitals into the AFFORDABLE system, there would be a seamless transition to their community following discharge and a reduced burden on social workers employed through the medical centers. Additionally, by connecting patients to sources of funding for medical bills and
medication we can reduce the burden of unsubstantiated medical debt on healthcare centers by serving as a direct platform for grant allocation or debt renegotiation that would redistribute high risk medical debt to other economic sectors (Schematic 2).* AFFORDABLE wants both private and academic medical centers to focus on what they do best—practice medicine. This goal is to secure medical care for patients that would not be able to afford it and improve resource acquisition for the hospitals that would be unable to attain it under standard conditions.

*Note this is a long term goal for platform development. Major institution integration and affiliation would require extensive validation before these companies would feel comfortable attaching their brand to a new service.

Schematic 2. Healthcare Integration Model. For lower middle class patients that encounter extensive medical bills that interfere with medical intervention, AFFORDABLE can serve as a medical debt marketplace that would connect patients, medical centers, and financial resources. The end result is an increase in resources for the physicians and a reduced financial burden for patients receiving treatment. Graphically illustrated above, if a patient is struggling financially to receive care, they can input their personal information into the AFFORDABLE system, where it will be encrypted and secured. We then connect them to the appropriate resources for financial assistance, which will then communicate directly with healthcare providers to reach an agreement on payment, enabling the patient to receive care.

**Health-Utilizing Grants (HUGs)—Purpose and Design**

In addition to the primary focus of network integration, we will also be promoting a unique holistic healthcare assistance program for these institutions. These micro-funds called “Healthcare Utilizing Grants,” or HUGs, will be given directly to individuals via donations from affiliated organizations. The recipient of the grant will be selected through a two-step voting process based on need and the contributing organizations’ mission. Public health is more than a prescription and requires a holistic approach to improve preventative care, pharmacological adherence, and quality of life. AFFORDABLE’s services will be specifically designed to assist the chronically ill, limited literacy, socially disenfranchised, and indebted population, where many city and community systems fall short.

These HUGs will function analogously to crowd funding organization schemes, but on an institutional level (Schematic 3). Smaller organizations with limited resources can contribute with nominal donations to support the health of individuals managing chronic disease or difficult circumstances. HUGs will be completed within the AFFORDABLE portal including candidate application and recipient selection to each fund. A two round voting system
OSU Capstone

has been chosen to support a fair selection system among donating parties and to implement a meaningful voting system with the following characteristics:

- Larger donors will have a greater voting power than those with the minimum contribution to each HUG
- Only candidates who receive a minimum of 1 vote in the 1st round will qualify for the 2nd round of voting
- During the second round of voting, organizations will not be able to select their first choice candidate

The weighted voting system is designed to incentivize larger donations to HUGs and justly gives these donors more input toward the final award winner. To balance this advantage and prevent discouragement from smaller HUG donors, the selection process is balanced by a second voting round where a second (different) candidate is selected by each donor. This structure 1) prevents having only one vote per applicant where the award would always go to the highest donor in large applicant groups and 2) prevents the largest donors from weighting their selection with two consecutive votes making other candidate selections unlikely. In conclusion, we believe this paradigm is both necessary and sufficient for HUG management and allocation.

Schematic 3. Health Utilizing Grant Application and Distribution Model. To explain how HUGs are structured, an example is provided using the illustration provided above. A patient with chronic kidney disease needs to monitor salt consumption and has an increased monthly food budget as a result of healthier food choices. The patient can search AFFORDABLE and find a 100 dollar HUG for food and nutrition. This patient then answers the HUG questionnaire, submitting the individual’s request. Several smaller organizations contribute to these HUGs, but they can only contribute a few dollars a month. So this HUG consists of 2 groups donating $25, 3 groups donating $10, and 4 groups of $5 totaling a 100 dollar fund. Then, the groups see the applications and vote on their choice for donation. Of the people selected, a second round of voting occurs and the person with the most votes is awarded the grant. The selected patient then receives a prepaid food card in the mail and information about the donor organizations that contributed.

Security Considerations

Briefly, cyber security is of the utmost importance in the era of information technology, and AFFORDABLE takes the issue very seriously as do its affiliated organizations. Because of our relationship to many healthcare and social welfare providing institutions that store valuable personal information, we strive to meet the gold standard of protection established by HIPAA laws. Prior to launch of our platform, we will need to meet the technical standards for cyber security, including but not limited to:
• Password protected accounts with password recovery options
• 2-step verification (we reduce fraud by confirming an email address and phone number)
• Automatic logout after 15 minutes of inactivity
• Information privacy training to volunteers at AFFORDABLE
• Database encryption information storage (prevents hacker access to sensitive information)
• Use of encrypted devices at AFFORDABLE
• Data breach risk management plan
• Written permission is required before using stored information for other purposes.

In addition to these important considerations while designing the platform, in order to uphold the HIPAA standard practiced by healthcare institutions, there are behavior and ethical considerations beyond the technical standards listed above. Given the potential damages these infractions can cause individuals, the AFFORDABLE platform, affiliated institutions, and contributors must be willing to learn and implement these standards into their work flow.

While we are early in the development process, we are currently planning for the integration of all of these units into AFFORDABLE. Students that may have a particular interest in some of these technical requirements would be able to learn these processes in great detail and should select a project relating to some of these widgets that will be integrated into the platform. However, we want to be clear that we may need to delay launch of the platform to ensure that we are in compliance with these requirements and meet the technical standards to ensure the security of those who trust us with their information.

MODULAR PROJECT DESIGNS FOR STUDENT CONTRIBUTION

The AFFORDABLE Development Team works on forming modular projects that can be completed with a small team during the semester. This provides a clear direction for work as well as evidence of progress as you develop a specific widget or functionality to be integrated into the greater AFFORDABLE network and code base. You can find more detail about the project outlined on a separate attachment. These projects frequently change as the platform grows and is tailored to the training level of the students and the university’s pedagogical interests. If you or a team of students wish to communicate with us regarding a specific idea or goal, we are willing to work with you and develop attainable goals and expectations for your capstone project.

During development, we will be in regular communication while you and your team work on different components of the project. The development team will meet weekly to talk about updates and difficulties. We will do our best to facilitate the learning process in case debugging is unsuccessful, as well as teach different skills during the process. This is not only an exercise in coding expertise, but teamwork and critical thinking.

In addition to regular team meetings, you will also have periodic PowerPoint presentations. This is to help gather your information together to keep track of your individual and group accomplishments during the semester, and to rehearse for the final presentation that will be given to faculty and peers. Please feel free to contact us if you have any questions or concerns about the general information provided here.
Content Summary

- AFFORDABLE is an automated community networking system designed to simplify the acquisition of resources for chronically ill and lower SE populations and reduce barriers to healthcare
- Small and Large Organizations would be able to coordinate more effectively to address community needs
- Long term development goals focus toward nonprofit, healthcare, and financial institutions to remediate both social and financial services to patients in need
- HUGs are institutionally funded microgrants through the AFFORDABLE portal system designed to improve the health of impoverished and chronically ill patients
- AFFORDABLE will uphold the highest standard of cybersecurity to ensure trust among affiliated HIPAA compliant institutions
- Suggested modular project ideas and outlines are provided for small student groups to be able to complete during one semester
- During the semester, we will be in regular communication with regard to progress and troubleshooting difficulties
- Periodically, we expect short oral/PowerPoint presentations to prepare for the required final project presentation
- Contact us if you have any questions at support@affordhealth.org