
2023 U.S. Information Technology Collegiate Conference

Systems Analysis and Design Competition

**Do not put your name(s) or your school's name on anything that you turn in!
This will result in disqualification of your team. Only use your team number.**

Help DFW: Resource management system for homeless shelters, food pantries, and other areas of refuge around DFW area.

Due to various reasons, a number of people are experiencing hardness and difficulties with their basic needs such as food, shelter, and health care. If people in need cannot get help in time, they may end up on the streets from where it is harder to get back to their normal life. Therefore, a lot of organizations are providing free resources to help. Food pantries, homeless shelters, and different types of help are being provided across the area. However, due to the limitation in space, resource, and volunteer, not all services are always available. When people are needing help, often times there is no place they can go and ask for all of their needs. Most often times, some services are provided more than needed while others are running short. It will be very helpful when information of available resources in the great DFW area can be organized in one place and people get timely updates. Your team is asked to create a system to help in this situation.

The proposed system will be used to help organizations share information regarding their services and also to help people in need search for the resources. The resource management system needs to provide the following functionalities.

There are three main roles in the system, providers, users, and administrators. Providers are the organizations who wish to use the system to communicate their resources to the users. Users are using the system to look for details about different resources that are available. Administrators are in charge of maintaining the system and also validate the providers' information. Each role will have different needs but there are some common requirements. The system will have to provide a system login process for providers and administrators. Users are not required to login unless the providers ask for reservation. All user data should be protected, the username and password will be used to validate user logins. The more specific requirements regarding different roles are listed below.

For providers:

- Providers need to be validated before they can start posting information. The basic information required from providers are business descriptions, name, address, phone number, hours of operation, and services provided.
- Optional information regarding the providers include website, photos, directions, and whether reservations are required.
- Once validated, providers will be given a username and password to login the system. Once in the system, providers can update their profile, change password, post their services under specific categories such as Healthcare, Shelter, Food, etc., and update the availabilities of different services.
- If the providers require reservation, they can post requirements, accept reservations, update reservations, cancel reservations, and send reservation confirmation, reminders, etc.

For users:

General users do not need to login to the system. They should be able to:

- View resources provided by providers
- Search for resources they need using keywords
- Browse resources by categories, distances, and availabilities

Optionally users can create an account and do the following:

- Make reservations with providers
- Receive confirmation emails and/or texts
- Receive push notifications with selected providers and/or resources
- Save their information for quicker access

For administrators:

- Administrators has their own login information and will be responsible for the following:
- Validate providers via a written request and create provider accounts
- Check/update provider logins, account status, and descriptions
- Check data integrity for the listings such as accurate name, address, contact information, available resources, etc.
- Maintain user account information

The system will be hosted as a website and also provide both a mobile app and web app so people can access it through their mobile devices.

Your team is asked to help with the development of this system. In your solution, the system specification must include elements to assure no violation of the aforementioned requirements. Multiple users may log in the system at the same time. Therefore, it is important to protect the working sessions so that there is no inconsistent data. Typical web security protections should be considered in your system analysis and design.

YOUR ASSIGNMENT IS to use only **one** technique (either Object Oriented **OR** Structured/Traditional Technique) to specify how the system should operate. If you use a structured technique you must specify the flow of data inside the system. If you use an OO technique then you must specify the classes inside the system and how they are used in order to achieve the system's objectives.

WHAT TO TURN IN:

If you are using the **structured/traditional approach**, then you are expected to turn in the following:

1. A Context Diagram.
2. A level 0 (zero) Dataflow Diagram.
3. A Level 1 DFD for each one of the processes that you identified in your Level 0 System DFD.
4. Process descriptions for the processes contained in your DFD's.
5. An Entity Relationship Diagram (ERD) showing the 3rd Normal Form Database that will support the system you designed.
6. Prototype with Windows Forms and/or Web Pages.

If you are using **an Object-Oriented approach**, then you are expected to turn-in the following:

1. Use-case Diagrams.
2. Use-case Descriptions.
3. Sequence and/or Activity Diagrams.
4. A Class Diagram (for objects in persistence storage).
5. State machine diagrams.
6. Prototype with Windows Forms and/or Web Pages.

For creating models, use your own business modeling software. This could include any CASE, I-CASE or other model-based development product.

The prototype must be developed based on your models. It does not have to be fully implemented; however, a system design that provide mocked up screens with window form/web page interaction will be considered in the over-all grading. The screens can be created using any graphical drawing software (such as Microsoft Paint or Photoshop) or you can take screen shots from development tools (such as Microsoft Visual Studio, Access or Eclipse).

When submit your work, make sure you submit **one pdf file through the contest LMS**. Do not write any information about yourself or your college. **ONLY** write your **team number** on your submission. If your submission contains any personal information, your team will be disqualified.

Contest Evaluation

The judges will use the following categories in evaluating your team solution. The models that your team is required to develop depend on which methodology is selected.

NOTE: Competitors are expected to utilize ONE and ONLY ONE Analysis and Design approach. Using a combination of components from both the Structured/Information Engineering approach and the Object-Oriented approach should be avoided.

	%	Structured/Info. Engineering	Object-Oriented Approach
Information Flow	40	Decomposition, DFD's, Dependency and Process Action Diagrams.	Use Cases, Sequence and/or Activity Diagrams
Information Structure	40	Entity Relationship Diagrams (ERD's) and Data Constraints	Class Diagrams (for objects in persistence storage) and State Charts (State Machine Diagrams)
Prototyping	20	Windows, Screens and/or Web Pages	Windows, Screens and/or Web Pages
Overall	100		