



Systems Analysis and Design Challenge

Professional and Staff Management System

Many organizations today hire highly skilled technical employees on a short-term, temporary basis to assist with special projects or to provide a needed technical skill. Professional and Staff Management System (PSMS) is a unique type of temporary staffing agency. PSMS negotiates contracts with its client companies in which it agrees to provide temporary staff in specific job categories for a specified cost. For example, PSMS has a contract with an oil and gas exploration company in which it agrees to supply geologists with at least a master's degree for \$5,000 per week. PSMS has contracts with a wide range of companies and can place almost any type of professional or scientific staff members, from company programmers to geologists to astrophysicists.

When a PSMS client company determines that it will need a temporary professional or scientific employee, it issues a staffing request against the contract it has previously negotiated with PSMS. When PSMS's contract manager receives a staffing request, the contract number referenced on the staffing request is entered into the contract database. Using information from the database, the contract manager reviews the terms and conditions of the contract and determines whether the staffing request is valid. The staffing request is valid if the contract has not expired, the type of professional or scientific employee requested is listed on the original contract, and the requested fee falls within the negotiated fee range. If the staffing request is not valid, the contract manager sends the staffing request back to the client with a letter stating why the staffing request cannot be filled, and a copy of the letter is filed. If the staffing request is valid, the contract manager enters the staffing request into the staffing request database as an outstanding staffing request. The staffing request is then sent to the PSMS placement department.

In the placement department, the type of staff member, experience, and qualifications requested on the staffing request are checked against the database of available professional and scientific staff. If a

qualified individual is found, he or she is marked “reserved” in the staff database. If a qualified individual cannot be found in the database or is not immediately available, the placement department creates a memo that explains the inability to meet the staffing request and attaches it to the staffing request. All staffing requests are then sent to the arrangements department.

In the arrangement department, the prospective temporary employee is contacted and asked to agree to the placement. After the placement details have been worked out and agreed to, the staff member is marked “placed” in the staff database. A copy of the staffing request and a bill for the placement fee is sent to the client. Finally, the staffing request, the “unable-to-fill” memo (if any), and a copy of the placement fee bill are sent to the contract manager. If the staffing request was filled, the contract manager closes the open staffing request in the staffing request database. If the staffing request could not be filled, the client is notified. The staffing request, placement fee bill, and unable-to-fill memo are then filed in the contract office.

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, 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, 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 DFDs.
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 persistent 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 Visio, CASE, ICASE 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 overall grading. The screens can be created using any graphical drawing software (such as Microsoft Paint or Photoshop), wireframing tool, or you can take screen shots from development tools (such as Microsoft Visual Studio, Access or Eclipse). Given the time limit of the

contest, handwritten mock-ups are allowed; however, the screens created by computer software will be given better grades.

Ensure that your team number is written on every sheet that you turn in. If you write your name or school anywhere, your team will be disqualified. Number all the sheets that you turn in, sequence them and account for them, i.e.: Page 3 of 7, Page 4 of 7, Page 7 of 7, etc.

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/Information Engineering	Object-Oriented Approach
Information Flow	40	Decomposition, DFDs, Dependency and Process Action Diagrams	Use Cases, Sequence, and/or Activity Diagrams
Information Structure	40	Entity Relationship Diagrams (ERDs) and Data Constraints	Class Diagrams (for objects in persistent storage) and State Charts (State Machine Diagrams)
Prototyping	20	Windows, Screens, and/or Web Pages (Prototypes/Wireframes)	Windows, Screens, and/or Web Pages (Prototypes/Wireframes)
Overall	100		