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Designing Information Systems

Assignment 1

Problem Statement

Electrical Components Company (ECC) is a large-scale manufacturing company that produces electrical components for major airlines and consumer goods companies. Component orders produced by ECC often undergo several processes in different areas of the facility, and are passed between many supervisors and machine operators along the way, leaving room for orders to be misplaced and lost. ECC operates under a tight schedule, and locating each order along each stage of the production process is critical to ensuring that components are produced and shipped on time.

ECC currently uses a paper contract system, which includes the use of a paper contract that accompanies each order as it moves through the factory, and details how long each process should take and where the order must be sent after the process is completed. While the method is simple, it restricts management’s ability to locate orders of concern and to ensure that each order is completed in a timely manner. Time requirements listed on the paper contract are often incorrect, and usually based entirely on estimates by engineers rather than on actual process time. Incorrect estimates often lead to late shipments that could otherwise be avoided.

ECC’s efficiency and production could be improved by instituting a system that allows management to track each order’s progress, both physically and where it is in its respective production process, while also allowing management to easily adjust expected process time for each step in a component’s production. An electronic system would also allow the elimination of the paper contracts which are often damaged and difficult to read by the end of a component’s production, reducing an operator’s ability to understand the expectations of each process and increasing the probability that the components will be produced incorrectly.

Organizational Environment

ECC is a large-scale factory devoted entirely to the efficient production of components for various customers. ECC employs several hundred employees on three different shifts, allowing it to operate twenty-four hours a day, seven days a week while handling hundreds of contracts simultaneously. Each work area is equipped with a computer that would allow for easy access to the system as it is needed. Management consists of several supervisors across multiple departments, as well as individuals who oversee the entire facility. System stability and up time is critical to analyzing productivity and ensuring that goals are met in a timely manner. Communication with material suppliers and customers is a constant, and the ability to quickly respond to changing conditions in supply and demand is also necessary. Although the company has large amounts of data to track, analyze, and store, the vast majority of all relevant documents are still kept in a paper format, with very little being done on electronic systems, greatly slowing down production.

Scope Statement

The system will have to be made accessible to both machine operators and various management and analysis personnel across multiple computers. The system will allow management to enter new contracts into the system as requested by customers, and will direct each order to the appropriate area of the facility to begin production. Machine operators will be able to view the contracts available to their work area in order of due date. Once an operator has completed their part of the production process, they will be able to clear the components to continue to the next process with the use of their employee number, and will also be able to update process time requirements as necessary. Employees will also be able to specify if a given contract is on its way to the next area, or if it has arrived and is waiting. The system will then update the contract to reflect the updated time requirements, as well as the current location of the components.

The system will be run by the in-house IT department employed at ECC, and will be made available throughout the facility using a company server.

The new system will:

* Allow for the entry of new contracts as they become available
* Direct existing contracts to the appropriate work areas
* Allow machine operators to view what contracts are available for their area in order of their due dates
* Allow operators to update time requirements and progress of each contract as it progresses
* Allow management and analysis personnel to track the progress of each contract to address concerns relating to productivity and the flow of work through the facility
* Store updated time requirements so similar contracts in the future will have more accurate predictions associated with their expected completion date
* Move completed contracts out of the system and into a database that stores historical data in case they must be analyzed or addressed later
* Reduce error and loss associated with managing contract data in a paper format

Impact

The new system will improve productivity by streamlining the production process, while also eliminating delays associated with lost or damaged paperwork. The system will also allow for more accurate tracking and analysis of each contract, assisting in the creation of more accurate forecasts and the ease with which production concerns can be identified and addressed. Increased access to process information will allow the company to analyze each stage of production, thereby allowing them to focus on streamlining stages of production that are slowing down the speed of the overall process and to more accurately estimate the timing for each stage in the process.

Constraints

One area of concern is the ability of employees to accept the new system. Although the current process is inefficient and prone to error, employees are familiar with it and may not be open to changing the way their duties are performed.

A second area of concern is the technical skill of each employee, and the need for each one of them to be trained in operating the new system. If the employees are able to accept the change of a new system, it will still be difficult and time consuming to provide each employee with the skills they will need to operate this new system. Many of the employees have minimal to no experience using a computer in any way.

The third area of concern is that of developing and instituting the software that will be necessary to operate the new system. While the company does have hardware available, inventory of it must be taken to ensure that it is capable of running a new system that will be more resource intensive.

The fourth area of concern is the logistics of moving everything to the new system. The twenty-four / seven nature of the company means that contract information is constantly changing, and that there can be no downtime to move everything on to the new system and ease the company into using the new system.

Initial Project Plan Stages

Project Identification: The company will be studied and interviews will be conducted to ensure that the analyst fully understands the problems of the current system as well as the goals of the company. After examining the company, the analyst will then conclude if the project would be a good fit or if other avenues should be explored instead.

Determining Information Requirements: The current system will be studied, and all data necessary to the operation of the current system will be examined to ensure that the new system will be capable of meeting the requirements of the company, while also increasing efficiency and productivity. Further interviews will be conducted with employees from each area that utilizes the current system to guarantee that all angles and opinions are accounted for before the project proceeds.

Analyzing System Needs: Using data flow diagrams, use cases, and use case scenarios, the analyst will study all of the operations of the proposed system, as well as the necessary inputs and outputs. The analyst will also create a dictionary that identifies and describes all of the necessary data in the system. A formal project proposal will be created and presented to the company for approval.

Designing the Recommended System: If the proposed project is approved by the company, the logic of the system will be designed based on the data flow diagrams. More detailed diagrams and documents will also be created, which will describe the actual data flow, and how the input and output will be formatted, and how they will function.

Developing and Documenting the Software: The system will be created and coded according to previously created specifications, and the appropriate manuals and documentation will be generated to ensure proper understanding of the new system.

Testing and Maintaining the System: The system and each of its components will be thoroughly tested using sample data to ensure that all areas of the system are functioning properly. Errors in the system will be corrected as they appear, and all documents will be edited to reflect the changes made.

Implementing and Evaluating the System: Once the system has been proven to be accurate and stable, the system will be installed on the company server and the switch from the old system will be made. IT members will be trained on the new system’s operation and maintenance, and all other employees who must use the new system will be trained to properly utilize it. Further questioning will ensue to be sure that the system is understandable and that it is operating in a live environment correctly.