

# AN INFORMATION SYSTEM TO REMEDY THE ISLANDS-OF- INFORMATION DILEMMA FOR A GIANT GREETING CARD MAKER

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## ABSTRACT

*In this paper, we describe a case study in which we have developed an Information system to solve a data management problem. The corporation, one of the largest greeting cards maker in the World, suffered from keeping islands-of-information that could not be integrated or shared. Each division within the corporation has its own human resource department, which in turn, operates its own information system to advertise for its own job openings. A job seeker has to search each HR department's database, apply with each department, and be interviewed by each HR department separately. In addition, departments cannot share information about an applicant, which may not fit certain department needs, but has all the qualifications that another department is looking for.*

**Keywords:** islands-of-information, SDLC, DFD, JRP, eHire, sharing, centralization

## PROBLEM DESCRIPTION

The company, where our case study was conducted, is one of the largest greeting cards and stationary maker in the world. The corporation, which was founded back in 1910 is based in the beautiful state of Missouri and employs 21,000 people nation wide. Its revenue for the year 1999 was \$4,200,000,000, its net profit for the same year was \$180,000,000 and was ranked 32 out of Fortune 500 private owned companies for the year 2000.

The corporation is organized into a number of different functional divisions. Each division has its own HR department and manages its own information system. Each HR department advertises its own job openings and conducts its own screening and hiring independently. This situation, which is commonly known as "Islands-of-Information", can best be characterized by:

- Existence of isolated independent repositories for each HR department with duplication of data.
- Poor communication amongst HR departments in addition to the fact that the corporate- level HR is totally unaware and uninformed of current open positions within departments.

These factors are the root causes for the following multiple problems for the corporation:

1. A job seeker has to search multiple databases in order to find out which job he/she is qualified for. If qualified for multiple jobs, he/she has to apply with each department, be screened then interviewed, after passing the screening process, by each department separately. Applicants' data is always duplicated when applying for multiple jobs since there is a little communication between the various HR departments.

2. Employees' manpower is wasted on duplicated external activities, such as manual screening and interviews, instead of devoted efforts to internal business processes.
3. Inefficient communication of inter-departmental business activities due to decentralized information systems.
4. Unawareness of the different HR departments of current recruiting and hiring practices of the corporation. Therefore they are not capturing specific data such as the one required for the Equal Opportunity Employment (EOE) regulations set by the Federal government.
5. Every functional division in the corporation is uninformed of other division's manpower, technology, education and other resources. This dramatically reduces the full and efficient utilization of the corporation resources should any division start working on a project.

### **DESCRIPTION OF THE PROPOSED SYSTEM**

For us, this problem was a typical "Systems Analysis & Design" textbook case study. Therefore, we chose to closely follow the steps of the Structured approach to the System Development Life Cycle (SDLC) throughout our system development process. Accordingly, our first task was requirements determination.

#### **Users' Requirements Determination**

We believe that any feasible solution to the problem at hand has to address the following issues:

- Reducing manual screening time.
- Creating effective communication between the different HR departments.
- Capturing the EOE data to comply with government regulations.
- Eliminating data duplication by creating one centralized repository.

However, in order to obtain a precise and complete list of users' requirements, we conducted a number of interviews with users on individual basis then complimented the interviews with one Joint Requirement Planning (JRP) session (1), (2), (8) and (11).

As a result, we compiled the following list of requirements where the system must:

1. Be an automated multi-user Web-based designed to reduce time spent on manual screening by using an automated screening via an online structured questionnaire. Managerial intervention will be required only after an applicant completes a valid job application. Applicants may access the system via CompanyName.com, search engines such as Yahoo, Alta Vista, Infoseek, employment recruiting sites such as Monster.com, Americas Job Bank Career Path.com, or Company employers through intranet to internet
2. Provides the following data about each job vacancy:  
Job code, Job title, Job description, Part-time or Full-time, Pay, Hours per week and Hire date.
3. Assigns a security password to each department manager in order to allow them to update their department job descriptions and information.
4. Captures the EOE information about each applicant who attempts or completes the automated screening process in order to comply with government policies.
5. Allows the corporation to track job seekers' attitude toward the corporation web site by identifying which part of the online application process deters a job seeker from completing the job application.

It will also show what question they did not like, what caused them to terminate the application process and leave the web site.

**System Planning**

The Corporation has set a target time line of 4 to 6 months to develop the proposed system and a budget equivalent to 10% of each department’s R&D budget. Our project was sponsored by both the CEO and CFO of the corporation. For system planning, we decomposed the development project into smaller activities, as shown in Table 1 below.

Activity #	Activity Name
1	Project Initiation
2	Requirements Determination
3	System Planning
4	Feasibility Study
5	Design
6	Construction
7	System Testing
8	Installation and Implementation

Table 1, Task Descriptions

We then estimated the Expected Time (ET) for each activity, computed the Earliest time (Te), Latest time (Le), and identified the project critical path as described in (2) and (11). Figure 1, below, shows PERT chart with the critical path marked in red along with times in weeks.

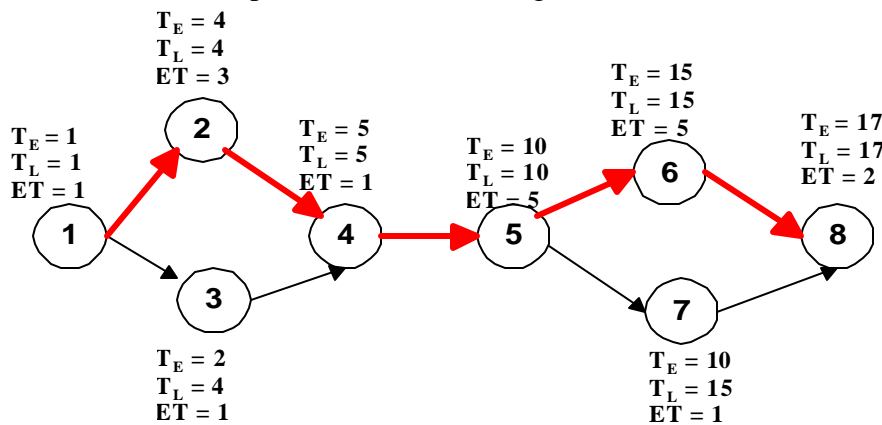


Figure 1, PERT chart

**Feasibility Study**

In order to even make a better case for developing the proposed system, we have conducted a limited feasibility study using the PIECES framework sessions described in (11) in the following areas:

- Financial: The proposed system is cost effective because it will be developed in house, which means it will be developed using existing resources, fits exact needs, and any future maintenance will be performed in-house. The system will also reduce cost by having one central HR department instead of multiple HR’s.

- **Technical:** All resources, such as database and web technology, as well as, the necessary professional expertise are already available within the corporation.
- **Performance:** The system will provide greater throughput, shorter response time, and timely information by utilizing the web interface.
- **Control:** The system we have proposed will provide an adequate firewall to prevent hackers from accessing applicants' personal information.
- **Efficiency:** The system will maximize the utilization of the company's resources by reducing HR employees' time spent on recruiting. It will also eliminate the time spent on written interview questionnaires, and promote information sharing among the different HR departments.
- **Services:** The system will provide a much better service level to applicants since they don't have to fill out multiple applications for multiple departments.

**Processes & Data of the Proposed System**

Figure 2, below, shows the context DFD, while Figure 3 displays level-0 DFD.

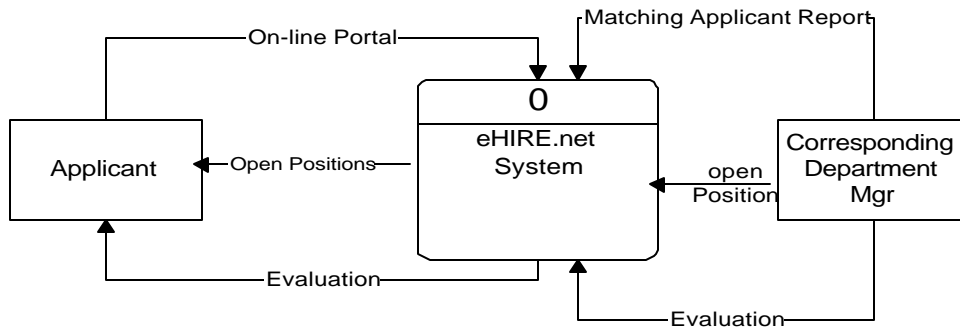
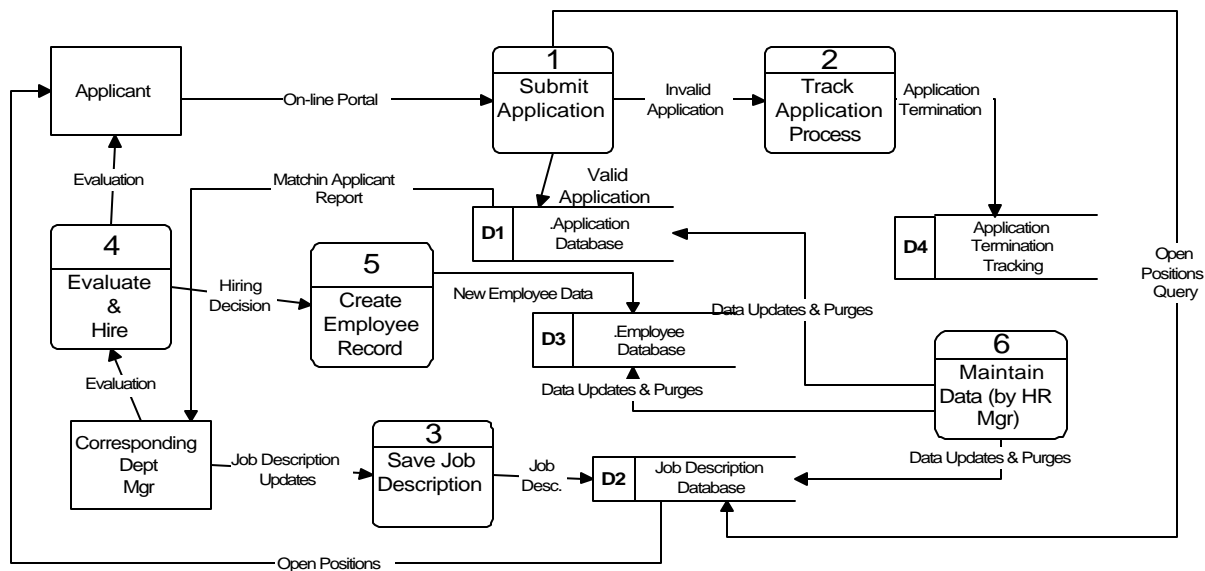


Figure 2, Context DFD

D4, in Figure 3 below, is an application termination database used to store the point of the on-line session at which the applicant terminated the session.



### Figure 3, Level-0 DFD

Next, we modeled the data which the system needs to function properly using the ERD Chen's notations explained in (1), (2), (4), and (11). In our system, eventually every entity has been translated into a database table. The primary and secondary keys for each table were identified, and the tables were normalized to the third normal form (3NF) using the tests described in (9) and (10) to avoid any anomalous behavior (7). However, these tables will not be shown due to space limitations.

As a result of our extensive joint meeting with system users, we were able to design all the web-based interfaces (6) and the output screens, which meet requirements using *'fireworks'*. The system has two categories of interfaces:

1. Interfaces that HR managers and recruiters use within the company (the Admin View).
2. Interfaces that job applicants would use via the company web site on the internet (the User View).

Again because of space limitations, no screens will be shown.

### System Construction and Implementation

The system was built using existing platforms and technologies, such as the web-server on a Sun Solaris platform and Oracle 8i database. Sun Solaris can run on either Intel or Scalable Processor Architecture (SPARC). The portals, on the other hand, were developed using *"Cold Fusion"*. *ColdFusion* allows for information transfer between client and the host side with CFM pages, which are the front-end pages that an applicant will be interfacing with. Java applets were used to allow the client to interact with the portal. Finally, all data transmittal is done through Secure Socket Layers (SSL) provided by the web server. This along with data encryption allows for protection against digital eavesdropping. We also developed help screens and are planning on incorporating an online glossary and an "operations manual".

After extensive unit, as well as, system testing (11), conversion to the new system will be executed following the parallel approach when the existing *manual* system continue to be used while operating the new system. This will allow users to adapt to the new system and discover any potential problem. This approach will not bare any additional cost since the old manual system has no overhead.

### How Does The System Work?

As mentioned earlier, the system would be provoked by job seekers via the company's web site "User View", as well as company's employees "Admin View". The Dialogue Diagrams (1), (2), which simply are road maps to navigate through the system and provoke its various functions are shown in Figure 5 and 6 below for both views. We believe that we have designed a simple, yet effective, navigation scheme, which lies somewhere between a tree and a full network (3).

As shown in Figure 5, after a company administrator logs in, he/she will then have the option to update jobs, view screened applicants, or utilize tracking tools.

If they choose to update jobs, they will have the option to update an existing job, add a new job, remove an existing position, or view all open jobs, by departments, code, or salary.

If the administrator chooses to view applicants, he or she has the option to either view contract info, screening results, resume, or forward the resume to another department.

Finally, if the administrator chooses to view EOE compliance report, he/she has to provide a login and password before statistics of applicants' gender and ethnicity are shown. Site Management Tracking screen, on the other hand, provides two more options. Choosing the "Hit Reporting" displays all the

information concerning how many times the web site has been visited, while choosing “Screen Reporting” will show all statistics concerning the screening questions.

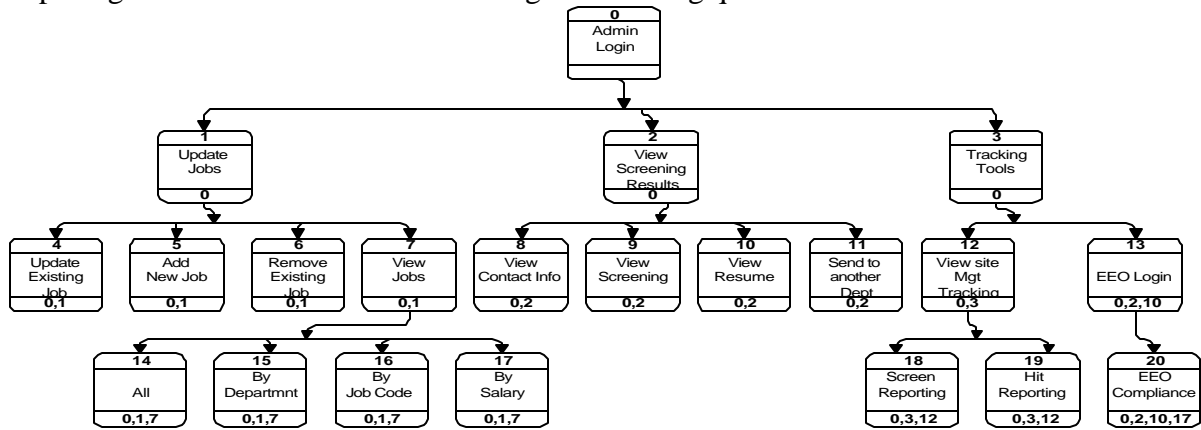


Figure 5, the “Admin View” dialogue diagram for the eHIRE.net system

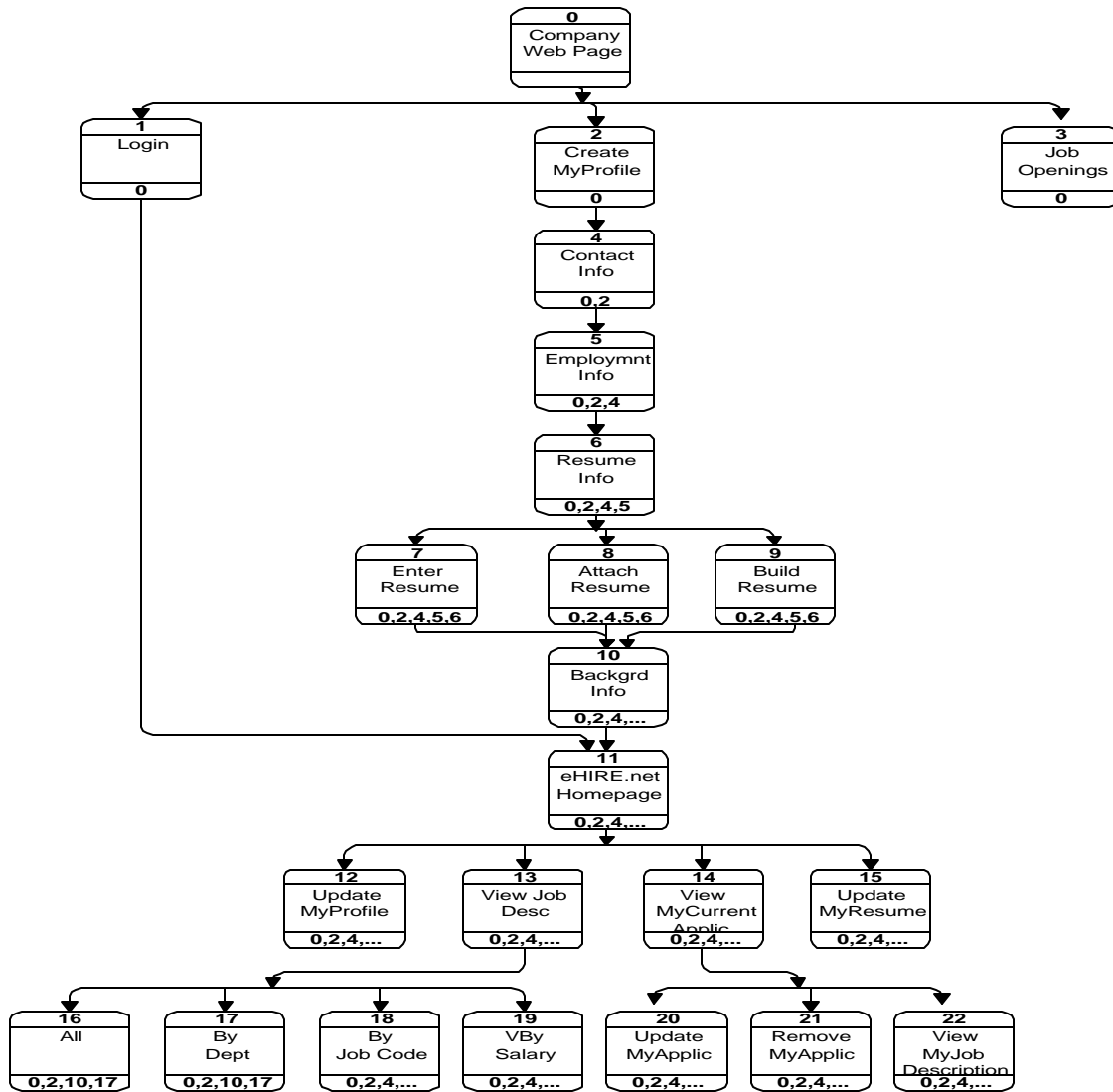


Figure 6, the “User View” dialogue diagram for the eHIRE.net system

On the user side, the company careers web page will first be displayed via the company web site. Next, the user will be given the option to login, create his/her own profile, or view job openings.

If the user is already a registered user he/she will be sent to the “My eHIRE.net homepage”.

If the user is not registered he/she will be given the option to create a profile, provide or update contact information, resume information, manually enter resume, attach resume, or build a resume using the company’s resume builder. Upon completing all of the these options the user may advance to a “Background Information” screen where he/she will be asked questions of whether he/she is legally permitted to work in the United States.

Next, users will advance to the “My eHIRE.net homepage” where they have the option to update their profile, view job descriptions, view their current applications, or update their resumes.

### **IMPACT AND CONCLUSION OF IMPLEMENTING THE SYSTEM**

Computerized IS have been used successfully to support the vast quantity of information available to business leaders and help apply this information in a way leading to competitive advantage and economic gain (5). According to our client, the system will have the following impacts on the recruiting and hiring process:

1. Saving manual screening time.
2. Improving departmental communication and recruiting data sharing
3. Generating a pool of candidates enabling HR managers across all departments to easily find qualified candidates since those candidates have already passed the screening process
4. Capturing EEO information, which the company needs to comply with government rules and regulations.

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