IPRO 347 Developing a document Control System FINAL REPORT

- Instructor: William Maurer
- **Sponsors:** Abrasive-Form
- **IPRO Team:** Vitali Basiourski, William Cabrera, Christopher Drag, Samad Erogbogbo, Richard Ike, Maciej Krolikowski, Daniel Mendez, Erin Mersch, Anton Orlichenko, Justin Roediger, Despina Zouridis
- **Date:** Thursday, July 24, 2008

1. Introduction

The IPRO 347 team is being sponsored by Abrasive-Form Inc. to lead the company into a paperless form of tracking projects. Abrasive-Form currently uses a paper folder, which they call the "job folder" to hold all the important documents for completing incoming projects. This job folder travels along with the pieces of the project until the project is completed. Once a project has been completed, and the final product is shipped out, the job folder for that project is then kept in an on-site filing cabinet.

So far this has led to several problems for Abrasive-Form. As the company is increasing in size and completing increasing amounts of projects, they have had to dedicate a large portion of their offices to the storing of old job files. Abrasive Form keeps all of their completed job folders for future access whenever the need may arise. This has also led to a lot of time being wasted by the employees of Abrasive Form traveling to the back offices where the job folders are held to look up information.

The IPRO 347 team will be helping Abrasive Form come up with a solution to this very serious problem. The solution generated thus far is to scan all the documents contained within the paper job folders into PDF form, and use a digital filing program (such as Bugzilla which is a free open source program) to organize the PDF files into sub folders, and allow for quick referencing based on critical criteria such as the job number, part number, customer name, or part number. All this information would then be contained in a single server that can be accessed on any computer throughout the company through an internal network.

2. Background

Abrasive-Form is a contract based manufacturer that specializes in precision grinding. They provide services for many metal industries, but focus primarily on the Gas Turbine and Aerospace Industries. Established in 1976, Abrasive-Form is a multimillion-dollar company with a modern 62,000 square foot plant in Bloomingdale Illinois, that houses 37 creep feed grinding machines.

As the unfinished products are received from the customer, Abrasive-Form creates a "job number" and "job folder" for that batch of product. This number and folder collect all the relevant data regarding the processing done to that batch. Abrasive Form uses a program called "Vista" that generates a large part of the paperwork and tracks other activities throughout the completion of the project. A physical job file is created and collects all of the paper documents that are related to the processing of the job. Most of the documents contained in this folder can be summarized as; incoming receiving documents, contract review and purchase order documents, in process inspection documents, subcontracting documents, shipping documents, quality control certificates, job processing documents, and other miscellaneous documents. Each of these documents are generating during various processes along the path of receipt, processing, inspection, and shipping. Depending on the status of the job i.e. open, pending, and closed, the job folder will be stored in multiple areas. This can lead to the job folder being misplaced since there can be ambiguity about the status of the job. There are various personnel that need access to the job files at various times for a variety of reasons. This includes Production, Quality Control, Sales, and Accounting. Access to these files may be required while the job is waiting to be processed, while it is in process, and several months after processing has been completed.

Abrasive-Form has contracted the IPRO 347 to create a digital form of the job folder that is easily accessible to all branches of the company remotely at their work stations. The folders should be searchable based on the job number, the customer name, and the part number. The access will allow viewing rights, printing, and emailing, and at no time will the documents be removed or altered from the database. There will need to be a procedure to quickly destroy the paper documents once they have been scanned into this system making the digital copy referenced by everyone.

This is the first project Abrasive-Form has done with IIT's IPRO office. Therefore, this will be the first attempt at correcting this problem for the company. However, with the ease of computers and the relative inexpensive costs for a company to outfit its employees with computers, this is not the first time a company has moved towards digital data storage and local network sharing. There are many examples of companies that have chosen to use digital storage successful and there is plenty of software available to organize the data. It is the responsibility of the IPRO team to listen to the wants and needs of Abrasive-Form and find the best way to transition this company to paperless records.

3. Objective

The objective of our team was determined by indentifying who the users of the database are and what demands needed to be met. We identified these users to be the five major departments of Abrasive-Form. These departments are IT, Accounting, Quality control, Operations, and Purchasing. After interviews and brainstorming, we came up with the following goals for our database:

- For the IT department, our goal is to have a database with the following capabilities;
 - 1. Remote access
 - 2. Off-site backup
 - 3. Search Engine (internal)
 - 4. Electronic Copies
 - 5. Real Time
 - 6. Easy/Fast Access
- For Accounting Department, our goal is that the database should have;
 - 1. Time/date Stamps
 - 2. Bar coding for incoming parts
 - 3. The ability to perform the same task as Visa (old system) thereby making it obsolete.
- For the Quality Control department, we want our database to have
 - 1. Email alerts
 - 2. Tracking of who's signing off on what.
 - 3. Ability to Alter Electronic documents (write to)
 - 4. Alarms/call to action on certain important issues.
 - 5. Tracking of Quality/Quantity issues
 - Order was 100 and we only sent 98, why? What's wrong?

1.

- Our goal for the Operations department is to create a database that will be able to generate and archive inspection reports.
- For the Purchasing department
 - We want the database to be "selective" or "qualified"
 - Eliminate remote access for purchasing personnel.
 - 2. The goal is to sub-divide the job folder into:
 - Purchasing/receiving
 - Inspection data
 - Outside purchases
 - Shipping
 - 3. The Job folder should be by arranged by project number (I.D)
 - 4. Our database should have the ability to send parts of the folder out to the customer if necessary (inspection data)
 - 5. The Database should be smaller than one gig per folder
 - 6. The Database should have ability to integrate data from CMM
 - 7. The Database should be able to import from Vista (old system)

4. Methodology/ Brainstorming/Work Breakdown Structure

Interview		rioritize and	Phase I
Customer to gather		Brainstorm	
information			•Create a working file system for the digital
		rms 1	folders. Investigate possible requirements. Computer running Windows Server 2003 Database Server (SQL) Internet Convection Necessary for Remote Desktop Create and test an interface for scanning Use program that comes with scamer to get images into .pdf form. It's possible to send everything to th new server. Click and drag the .pdf's to appropriate folders. Scan from the work station and put on to the server. Program an interface for the customers to make it easier to put the pdf's into the correct job folder.
•Will give u •Multiple previou •Identify th •Fold	of a typical job foldes s an idea of how mu s jobs e best organization f er, sub-folder, etc. •Purchasing •Receiving •Inspection Data •Outside Purchases	ch space will be n	rcessary for the server vorkstations using Remote Desktop.

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	Description	Start	Finish		JUN 1 1 1 1 9 1 1 1 1 16 1
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AF	Brainstormed kleas for Abrasive-Form	03J U N08	03J U N08	2	
AF			05JUN08	2	Brainstormed Ideas for Abrasive-
AF	Formed Groups/Questions for A-F Dept. In In that is to where with Abras in Some	12JUN08	12JUN08	3	Formed Groups/Questions f
AF	Initial Interview with Abrasive Form Re. Formed Crowns to Ett A. Fis. Needs	17JUN08	17JUN08		S Initial Inter
AF	Re-Formed Groups to Fit A-F's Needs Created 2nd Interview Questions	12223 2.2016		1	
AF		17JUN08 19JUN08	17JUN08	3	
	2nd Interview with Abrasive Form	0.000	19JUN08	3	
AF	Create Project Plan Meet With Abrasive-Form	24JUN08	24JUN08 03JUL08	3	
		03JUL08	10,101,08	-	
AF	Progress Report with Abrasive Form			3	
AF	Presentation for Abrashe-Form	17JUL08	17JUL08	-	
AF	Create Powerpoint Presentation for IPRO D		22JUL08	2	
AF	IPRO Day Presentation	25/01/08	25JUL08	1	
AF	Final Presentation for Abrashe-Form	29J U L08	29J UL08	3	
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Task					12.1
AO	Research Content Management Systems	11JUN08	11JUN08	2	🛢 Research Cor
AO	Set up Bugzilla	16J U N 08	16JUN08	2	5 S
AO	Populated Bugzilla with Sample Jobs	17JUN08	17JUN08	1	5
AO	Research Search Englises	23JUN08	23JUN08	2	100
AO	Set up Django	23J U N08	23JUN08	1	
AO	Create Django Database Models	23J U N 08	23J U N 08	4	
AO	Create Django Database Models	24JUN08	24JUN08	4	
AO	Setup Django Administration Site	24JUN08	24JUN08	1	1
AO	Work on FirstA-F Progress ReportPesent	antion 25JUN08	25JUN08	2	1
AO	Prototype Django User Internace	05/01/08	05J U L08	5	1
AO	Prototype Django User Intentace	06J U L08	06J U L08	5	
AO	Research MicrosoftSharePoint	15J U L08	15J U L08	1	1
AO	Populate Demo SharePolutSite with Sample	e Jobs 16JULO8	16J U L08	- 1	1
AO	Work on IPRO Presentation & Presentation	for A-F 20JUL08	20JUL08	3	
hristopher D	Drag				
Task					
-	Interviewed Operations Manager	19J U N08	19J U N08	2	
CD	Researched Scamers and Printers	24JUN08	24JUN08	1	
CD	Filtered Needs from Wants	03JUL08	03JUL08	1	
			11JUL08	2	
_	Worked on Recommendations for Final Rep Researched Storage Area Networks	13JUL08	13JUL08	2	
CD	Researched Storage Area Networks			1	
	Complied Storage Area Network Information		14JUL08		
CD	Discussed SANs, Networks, and Software 1 Discussed Storage Area Networks for A-E		15JUL08	1	
CD	Presented Storage Area Networks for A-F	17,10,08	17JUL08	2	
CD	Revised Abstract	22/01.08	22JUL08	1	L
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VB	TestBugzilla	25JUN0		3	1
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VB	Research Barcodes	27 J U N O		2	1
VB	Research Servers	01JUL08	01JUL08	3	
VB	Research Database ManagementScreen	s 02JUL08	02JUL08	1	1
VB	Research CISCO Firewalls	07.1 U LOS	07.JUL08	4	
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5. Assignments

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worker, AUTOCAD intern/research assistant.	
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experience. metallurgy and a degree in	
management.	
Krolikowski, 4 th year BME Team worker, Neural engineering device Purchasing/Production of	control,
Maciej Project construction and File organization & so	anning
management, demonstration (2 years)	
project construction Currently designing neural	
and demonstration probe controllers.	
	rations
team skills intern. Interests include	
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Our team was also divided into sub teams as follows;

- IT
- 1. Erin Mersch
- 2. Anton Orlichenko
- Operations
 - 1. Daniel Mendez
 - 2. Christopher Drag
- Purchasing/Product Control
 - 1. Despina Zouridis
 - 2. Maciej Krolikowski
 - 3. Justin Roediger
- Accounting
 - 1. Richard Ike
 - 2. Samad Erogbogbo
- Quality Control
 - 1. Vitali Basiourski
 - 2. William Cabrera

Minute Taker	:	Erin
Agenda Maker	:	Team
Time Keeper	:	Team
Weekly Timesheet Collec	tor:	Professor Maurer
Master Schedule Maker	:	Samad
Igroups	:	Team

6. Budget

Our major expenditure was on transportation to and from our sponsors head office in Bloomingdale Illinois. Six students drove their cars to aid in the commute. A total of 1918 miles were covered during the semester. The table below breaks down the mileage for each driver;

		Trave	elled miles o	f each driver		
Date of trip	12-Jun	19-Jun	3-Jul	17-Jul	29-Jul	TOTAL
Justin Roediger	91	91	91	91	91	455
Chris Drag	68	68	68	68	68	340
Samad Erogbogbo	91	91	91	91	91	455
Vitali Basiourski	22.3	22.3	22.3	22.3	22.3	111.5
Despina Zouridis	72	NA	72	72	72	288
William Cabrera	67.34	na	67.34	67.34	67.34	269.36
Grand Total						1918.86

7. Obstacles

Our teams' execution of this project was hindered by a couple of factors which we overcame through team work and adequate strategizing. These obstacles are listed below;

- 1. Difficult to get in contact with company
 - Delay in project progress
 - Delay in interviews
 - Information of current resources not clear
- 2. Interviews
 - Employees more concerned with wants than needs
- 3. Majority of the team not familiar with programming
 - Creating a customized database proves to be a difficult task

8. Results

Our team considered certain options such as scanning the work documents and storing them in individual work folders while using a search engine that would search through those folders in order to find a certain document or several document. Another option was to create a custom database that would store and pull the job folders out of a server or out of a storage area network. After meeting with the company several times to discuss their needs, the team was able to find a practical solution to their paper cluttering problem. We were able to come up with a database using a program called *SharePoint*, which comes free with any recent Microsoft server. This program works by having the users individually login to access the job folders. However, the files would not be stored on the server because this would slow down the performance of the server as well as frustrate the users by causing a time-lagging barrier. Instead, all the files and folders would be stored onto a Storage Area Network (SAN), which is a separate module filled with hard drives that is independent of the server. In order for users to access the job folders on the SAN, the server would be connected to the SAN, which would act as a bridge, and transfer the documents or job folders to whichever user is trying to access it. This would avoid timelagging and user frustration.

Below are copies of various functions of our share point data base;

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9. Recommendations

In order to continue the success of this IPRO into future semesters, our team has come up with some recommendations that will be helpful. These recommendations are;

- Future IPRO members should be familiar with *SharePoint*, which is a content management system that comes with Microsoft Server 2003.
- Future members need to work closely with Abrasive Form to improve the functions of the database in order to make it easier to use, improve its accessibility to multiple users logged on simultaneously.
- Future members should use this semester's module and create more features and perks that will improve the overall flow and consistency of the content management system. It is preferred that some of the future members are computer science majors, or familiar with the Microsoft Server application.
- We recommend the purchase of several scanners that will help Abrasive-Form scan and store their paper documents into a digital form. Having separate scanners, besides those used for day to day activities, will shorten the amount of time needed to scan and save 15 years of data. We found many high end scanners that will provide Abrasive-Form with the support they need, at a relatively inexpensive price.
- We suggest the purchase of a Storage Area Network (SAN) for Abrasive-Form. This network allows Abrasive-Form to digitally store their files on hard drives safely and accurately. This is a very good item to have since a SAN comes with expandable memory. We estimated that Abrasive-Form needs approximately two Terabytes of storage in order to convert their documents into a digital pdf file.

10. References

All the information needed for the execution of this project was obtained from online research. Information on storage solutions was conducted through various phone sessions with companies like Microsoft. Scanner recommendations were researched through various electronic stores and some models were obtained via recommendation from outside sources. Our sources include the websites of Google, Microsoft, Bugzilla and Django.

11. Acknowledgments

We extend our thanks, in no particular order, to the following;

- Prof. Will Maurer for his guidance and support in the execution of this project.
- Abrasive Form for allowing us this opportunity, in addition to their help and input via answering questions or providing documentation to ensure the end product is satisfying for both parties.
- Justin Moses for his input and help in the design of a layout and functionality for the user interface of our initial product (version 0.0)
- Mark Sami, IIT graduate and SharePoint consultant, for his coaching and recommendations on how to improve and maximize the efficiency of our product for the customer. He was also instrumental in our choice of using share point.