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Business Intelligence Strategy At The Hanover Insurance Group

A Major Qualifying Project Report

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By

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Abstract

This Major Qualifying Project, prepared for The Hanover Insurance Group, describes the prototype of a newly developed system designed to collaborate with the efforts of the Business Intelligence Strategy at Hanover. The requirements and necessary business process flows included in the system were gathered through interviews with Hanover employees and from report creation documentation kept by the Management Information Systems (MIS) team at Hanover. The newly developed system provides information for the MIS team at Hanover on commonalities on data manipulation to facilitate the transition to automated reporting procedures, mitigating the risk from high-touch processing and human errors. The system also provides the Hanover employees with simplified procedures to extract the necessary data for their reports. A prototype of the system was built in Microsoft Access supplemented by wiki pages for demonstration purposes.

Executive Summary

This MQP project was completed in cooperation with the Hanover Technology Group (HTG) at The Hanover Insurance Group, in Worcester, MA. Through this project, we created a prototype for the Process Documentation Repository (PDR) system and its supporting wiki-pages to help Hanover with the implementation of its Business Intelligence (BI) initiative that is currently being enforced by documenting and centralizing current reporting procedures.

Through the BI initiative, Hanover hopes to identify high impact, value added investments that clearly align and support business priorities, and identify and quantify current business opportunities that have clear efficiency payback. With the budgeting season for the fiscal year 2012-2013 approaching, HTG is hoping to demonstrate the need for resources they currently have. By using our system, HTG will be able to portray the business value of simplifying and automating reports creation procedures. Our prototype will assist them in these goals through the consolidation of process documentation and a searchable collection of data in order to obtain key business information. Before building the prototype, we completed a cost-benefit analysis of our system to portray the value that our system will add to the company.

We developed the prototype to serve two types of users. The first type is the employees of the MIS team at Hanover, who will access the raw data, the database schema, and the code and queries behind the PDR. The reports produced by the MIS team at Hanover will be used to establish the feasibility and priority of future projects that the company may wish to take on during the course of the BI initiative. The second type of user is the employees that work directly with insurance policies. This type of user will only be able to see what is on the wiki-pages, which are on the intranet of Hanover's network and display high-level information for both processes and data sources. The second type of users will become aware of any change in the reporting procedures via this central site, maintained by the MIS team at Hanover.

In summary, this project was completed in two terms for the Hanover Insurance Group to further progress their efforts in a BI initiative. It was developed for two types of users to ensure proper communication and efficient reporting procedures, while preserving data integrity across Hanover. The overall business value of this project is the documentation and centralization of reporting procedures, facilitating the analysis for business intelligence changes moving forward.

Authorship Statement

Abstract – Luis

Executive Summary – ALL

Acknowledgements – ALL

Introduction – Sean

Literature Review – Wenxuan

Methodology – Sean

Analysis and Design – Luis

Implementation – Luis

User Manual – Sean

Technical Manual – Sean

Documentation Documents – ALL

Process Flows – ALL

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Letter from Project Sponsor

12/7/11

Luis, Wenxuan, and Sean,

Thank you for your efforts over the past two months to address Hanover's need to further the process documentation efforts surrounding those business areas that involve MIS activity. Additionally, your work to construct an application that allows query capability into the data stores germane to these processes is certain to improve our abilities to assess and communicate changes and impacts as we forward our Business Intelligence strategy.

We look forward to continuing to work with you as you progress towards project completion.

Regards,

Kim Killeen

Lisa Voellings

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Chapter 1: Introduction

The Hanover Insurance Group

The Hanover Insurance Group, Inc. based in Worcester, Mass., is the holding company for a group of insurers including The Hanover Insurance Company, Citizens Insurance Company of America, and Chaucer Holdings PLC. The Hanover serves businesses, individuals, and families, offering its products through a select group of independent agents across the U.S. (The Hanover Insurance Group, Inc., 2011).

To better accommodate the needs of their clients, Hanover offers a wide range of Personal Line and Commercial Line products. Hanover defines their commitment with their clients as "an intense focus on doing what we propose to, doing it well and doing it with speed" (The Hanover Insurance Group, Inc., 2011). In order to achieve this, the company considers that quality has to be constantly underwritten, products need to be innovative, applied technology needs to be powerful and service has to be quick in delivery.

In an effort to strengthen the commitment with clients and as part of the overall development of a comprehensive, enterprise wide Business Intelligence Strategy, it is critical to understand the manner in which Hanover's business partners are fulfilling their business intelligence needs today. In order for Hanover to be better informed and mold the strategy accordingly, creating a complete set of business process documentation is critical.

Project Overview

The project sponsors and main contacts at Hanover were Karen Winsky (Program Director of IP Quality Assurance) Cilsy Harris (Vice-President, Hanover Technology Group), Kim Killeen (Director, Management Information Systems), and Lisa Voellings (Vice-President, Financial Systems).

Hanover was implementing a Business Intelligence Initiative to reduce risk by making reporting tasks more efficient. The vision of the initiative is, "To Provide accurate, timely and pertinent information, in an efficient manner, to improve analysis and inform decision making of business leaders." (Harris, 2011) The main objectives of the Business Intelligence Initiative were (1) to create enterprise alignment and clarity, (2) institutionalize a collaborative, cross-functional

Business Intelligence Community, (3) identify high impact, value added investments that clearly align and support business priorities, and (4) identify and quantify current business opportunities that have clear efficiency payback. For more detail on the background and implications of the Business Intelligence Initiative, please see Appendix H – Business Intelligence Initiative Background.

Problem Statement

In the 21st century, it is a necessity to be able to manage and process the never-ending flow of data and information. However, common issues that plague most companies are data redundancy, poor data control, non-intuitive user interfaces, and poor data integration. The situation at Hanover is no different.

Hanover employees are utilizing various data stores to extract the data they need in order to produce various reports across the organization. Most of the data that is currently being used is being extracted by various employees in different areas, creating data redundancy. Hanover employees utilize multiple data sources because the information they find in one of the sources is incomplete, inaccurate, or some of the systems are not updated regularly enough for their reports.

Most of the data necessary for reports in a certain business area is extracted from the systems maintained by the Hanover Technology Group (HTG), and placed in Microsoft Access databases or Excel spreadsheets maintained by employees that work closer to the business and are not part of HTG.

The databases and spreadsheets mentioned above are kept in individual desktops and are not maintained by HTG. HTG has no easy way to verify that these local databases have the proper infrastructure to support key business processes to produce accurate reports. The data in those systems is updated as often as the user that owns it refreshes the data, rather than HTG updating it automatically. In many cases, the local databases and spreadsheets are shared with other Hanover employees. Thus, if the data is inaccurate in the databases and spreadsheets because it is outdated or imprecise, it will be inaccurate in the reports that are produced with it.

Due to the complexity of the process, many of the business reports require a high-touch process to create them. Some of the reports take days or weeks to be crated, and there is a big change for human error or data inaccuracies because of all the data manipulation that each report involves.

Objectives

The first objective of the project was to document various business processes throughout multiple departments at Hanover. These business processes were mostly ones that produce reports and were pulling data from data stores and using that data in a meaningful way. To obtain this information we met with different department heads (or other delegated employees).

The documentation consists of a preparation form that contains certain requirements for each meeting Appendix B – Business Process Flow Preparation Form. This form guided the discussion so that we could gather the important steps in the process flow in order to diagram afterwards.

Once the process documentation was completed, we then designed a system that achieves multiple functionalities. First, it is be able to hold the numerous pieces of data from the documentation and organizes the information on the data sources such that the information has the capability to be searched in a variety of ways. In addition to making the data available to the Business Intelligence and MIS teams at Hanover for querying and editing, we also made certain aspects of the data available to the various employees at Hanover. The employees need to know if any aspect of their process changes.

Chapter 2: Literature Review

Industry review

Insurance, in a simpler term, is a method for risk mitigation. For example, a family will try to reduce the financial risks produced by a death through a life insurance company. Businesses and Corporations try to mitigate risks through commercial insurance companies. Each policy is a contract in which the insurance company agrees to compensate or indemnify the policyholder or beneficiary for the possible loss or damage that a specific object can incur from certain perils or risks, in exchange of monthly payments for the services described (Oxford University Press, 2011).

Type of Insurance

There are several types of insurance policies; some of the most common ones are listed in Table 1, below.

Table 1 - Insurance Types, (Investopedia ULC, 2011)

Insurance Type	Description
Life Insurance	Insurance against expenses incurred due to the death of the insured. A premium is given to the insured if he or she lives beyond a certain age.
Health Insurance	Insurance against expenses incurred through illness of the insured.
Liability Insurance	Insurance against expenses incurred by damages to property such as automobiles, real estate and professional/business mishaps.

There additional insurance categories to the ones listed above, such as Supplemental Insurance, Travel insurance, and workers' compensation amongst others.

History of Insurance Companies

The first insurance company established in the United State was the Philadelphia Contributionship. It was formed in Charleston, South Carolina, in 1752 and underwrote fire insurance. Prior to insuring a building the company would send surveyors to inspect the building and then the directors would determine the rate. In some cases the company refused to insure certain buildings where the risk of fire was too great, such as all wooden houses. Nowadays, the Philadelphia Contributionship continues to issue policies under the name of The Philadelphia Contributionship Mutual Holding Company (The Philadelphia Contributionship, 2010).

The first joint-stock insurance company formed in the United Sates was, as it is yet, the Insurance Company of North America in 1792. The Insurance Company of North America introduced the concept of "protection against fire and marine hazards which was to revolutionize crude underwriting and provide the very cornerstone of modern commercial progress as the basis of business credit" (Insurance Company of North America, 1916).

Regulation

There are two major categories of Regulation: the State Based Insurance Regulatory System and the Federal Regulation of Insurance (Kofman & Pollitz, 2006). The history of insurance regulation, however, has been marked by federal-state tensions and accommodations, and, after more than a century of state dominance, by periodic proposals for federal intervention (Randall, 1999).

State Based Insurance Regulatory System

Historically, the insurance industry in the Unites States has been regulated by the individual state governments. The first state commissioner of insurance was appointed in New Hampshire in 1851 (National Association of Insurance Commissioners, 2011).

The goals of insurance regulation articulated by most states include fair pricing of insurance, protecting insurance company solvency, preventing unfair practices by insurance companies, and ensuring availability of insurance coverage. Each state has a department within the executive branch to regulate insurance. The head of the department is usually called the commissioner or director of insurance. A handful of states elect their insurance commissioner. In the remaining states, the insurance commissioner is appointed by the governor and serves at the governor's pleasure.

The insurance department typically has broad, legislatively delegated powers to enforce state insurance laws, promulgate rules and regulations, and conduct hearings to resolve disputed matters. In practice, this power is exercised sparingly, partly because state insurance departments are often significantly underfunded and partly because of political preferences for less regulation (Randall, 1999).

Federal Regulation of Insurance

As mentioned before, Federal Regulation of Insurance vs. State-regulated insurance is an on-going debate. Some insurers — joined by some banks with insurance affiliates — believe that current state insurance regulation hinders their effective competition with other financial intermediaries. They want a more uniform system and many have called for the option of obtaining a federal charter and subjecting themselves to a single, federal regulator (Webel & Cobb, 2005). The federal government now has the infrastructure and the resources to protect consumers (Baker, 2007).

The Hanover Insurance Group

This section of the Literature review discusses the Hanover Insurance Group specifically. It talks about the company's history, the various goals and objectives of the company, as well as external rating in the insurance industry.

History

The Hanover Insurance Group, Inc. was formed in 1852 in New York City to protect businesses and homeowners facing the common 19th Century hazard of fire. By the early 20th Century, The Hanover began to expand its business to include automobile and marine insurance policies and by 1916, auto insurance was a significant business. (The Hanover Insurance Group, Inc., 2011). At the time of the 1929 stock market crash, Hanover's holdings were largely liquid, so the impact from this event was minimal. In fact, Hanover was one of only five large U.S. fire insurance companies that had a larger book of business in 1935 than it did in 1930.

Following World War II, vast changes occurred in American business and Hanover would be part of that change. In 1964, the highly successful Citizens Insurance of Michigan joined Worcester, Massachusetts-based State Mutual Life Insurance Company to expand beyond its Midwestern markets. In 1969 Hanover became affiliated with State Mutual and gained access to new resources for product development, underwriting, data processing, investment and claim, policyholder and Agent services. It was also at this time that Hanover moved to Worcester to reduce the operating costs associated with its location in New York City. (The Hanover Insurance Group, Inc., 2011).

By 1979 Hanover was consistently outperforming the industry and becoming a recognized and trusted name in local markets. The company began introducing numerous new products and services, along with new data processing systems that enhanced productivity and service.

In 1995, State Mutual became a publicly-traded company, renaming itself Allmerica Financial Corporation. Throughout the 1990s, Hanover worked even more closely with its Allmerica affiliates, leveraging the considerable resources of the group to improve its products and services such as electronic funds transfer and computer links with Agents. At the same time, Hanover continued to emphasize its traditional strengths—its regional focus and local market knowledge, established relationships with high-quality, service-minded Agents, and underwriting discipline. (The Hanover Insurance Group, Inc., 2011).

From 2003 to 2004, the company restructured to significantly improve its financial position, organization and operating model. Under CEO Fred Eppinger's direction, the company also refocused on becoming a world-class property and casualty company that provided the "best of both"—the financial strength and products of a national company with the local market knowledge and service of a regional insurer. (The Hanover Insurance Group, Inc., 2011).

In 2004 and 2005, the company demonstrated its financial strength by weathering an unprecedented string of major hurricanes. Despite these challenges, the company strengthened its reserves and delivered record net earnings. In 2005, the company made the strategic decision to sell its life insurance affiliates. With this sale, and after making tremendous progress in all areas of its property and casualty business, the company changed its name from Allmerica Financial Corporation to The Hanover Insurance Group, Inc.

The Hanover, as it is known today, is the holding company for The Hanover Insurance Company, Citizens Insurance Company of America and their affiliates. As a stronger, more focused company, *Our policy is performance.*™ (The Hanover Insurance Group, Inc., 2011). The Hanover Insurance Group offers a wide range of property and casualty products and services to businesses, individuals, and families through agents across the U.S., The company is ranked

among the top 25 property and casualty insurers in the country and maintains excellent ratings from A.M. Best, Standard & Poor's and Moody's. (The Hanover Insurance Group, Inc., 2011).

Goals

To better understand the industry, the position of The Hanover in the marketplace, and its vision, we need to be congruent with their goals for a successful completion of our project. A brief description of each of The Hanover's goals as listed in their web page is provided below. (The Hanover Insurance Group, Inc., 2011).

Attracting, Retaining and Developing the Best People

The Hanover relies on dynamic leadership to set the course and exemplary service by our employees to distinguish themselves from the rest of the pack. Hanover is committed to invest substantial resources in the people, building the best leadership, home office and front-line staff possible.

Maintaining a Financially Strong Company

The Insurance business is all about delivering on promises. The Hanover affiliates will continue to provide the dependability and stability that our Agents and their customers need.

Partnering with Winning Agents

Creating an effective and mutually beneficial relationship with the Agents is a top priority for Hanover, having as the objective to know the needs of Hanover's Agents and their clients far better than the competition and to align their capabilities with important and timely opportunities.

Building a World Class Underwriting and Product Capability

Hanover will focus on the business they have an expertise at and our customers need most - small to mid-size commercial and personal lines. Continue to know the markets better than their competitors - maintaining well-informed underwriting practices and innovative products that meet the clients' needs.

External Ratings

The Hanover has obtained very high ratings on its financial strengths, as it can be seen in Figure 1. With these ratings, The Hanover proves to be a reliable company with a strong financial position in the market.

Financial Strength Ratings (Subsidiaries)				
	AM Best	**S&P**	**Moody's**	**Fitch**
The Hanover Insurance Co.	A (5/8/2009)	A- (5/30/2008)	A3 (1/28/2008)	A- (2/25/2009)
Citizens Insurance Co. of America	A (5/8/2009)	A- (5/30/2008)		A- (2/25/2009)
AIX Specialty Insurance Co.	A (5/8/2009)			
NOVA Casualty Co.	A (5/8/2009)			
Professionals Direct Ins. Co.	A (5/8/2009)			
Verlan Fire Ins. Co.	A (5/8/2009)			
Credit Ratings				
Senior Unsecured	bbb (5/8/2009)	BBB- (5/30/2008)	Baa3 (1/28/2008)	BBB- (6/11/2007)
Junior Subordinated Debentures	bb+ (5/8/2009)	BB- (5/30/2008)	Ba1 (1/28/2008)	BB (1/29/2010)

Figure 1 - Financial Strengths Ratings (The Hanover Insurance Group, Inc., 2011)

Personal & Commercial Lines

Personal Lines

Hanover offers a "Total Personal Insurance Solution". As a property and casualty insurance company, Hanover insures intangibles such as "the comforts of home, the convenience of daily transportation, the joy of recreation, the beauty of heirlooms and important memories" (The Hanover Insurance Group, Inc., 2010). It offers four flexible packages of homeowner's insurance coverage with options for single family homes, condominiums, apartments, and renters. It also offers auto coverage that can be customized to suit individual needs.

Table 2 - Personal Lines

Coverage Type	Details
Home Insurance	• Single family homes • Condominiums • Apartments • renters
Auto Insurance	• Roadside Assistance • Ultimate Service

Coverage Type	Details
	• Drive Smart Advantage • Extended non-owned coverage • Reassurance Plus Endorsement • Travel Right • Rental Coverage Upgrade
Toys	• Recreational Vehicle insurance • Watercraft insurance • Account Extras
Umbrella & Identity Theft	• Umbrella Insurance • Identity Integrity Program
Valuables	• Valuable Items Plus Blanket Property • Scheduled Personal Property

Commercial Lines

Commercial Line products are categorized by the business size, industry, land/ocean, and financial products.

Small Business Insurance

The Hanover Insurance Group has a very established package for small business. As Hanover knows it's hard to run a business, it makes insuring it easier with a complete portfolio of affordable small business insurance coverage. Table 3 below shows the different types of coverage available and the breakdown of each. (The Hanover Insurance Group, Inc., 2011).

Table 3 - Small Business Insurance

Coverage Type	Details
Standard Small Business	• Business Owner's Policy • Commercial Package Policy • Workers' Compensation • Commercial Automobile • Commercial Umbrella
Specialty/Value-Added	• Property & Liability Broadening Endorsements • Industry-specific Broadening Endorsements • Miscellaneous Professional Liability Insurance for consultants and 30+ other classes • Employment Practices Liability Insurance
Technology Company (Specialty)	• Technology Specific Broadening Endorsement • Special Liability Endorsement • Technology and Telecommunications Products and

Coverage Type	Details
	Professional Services Coverage Endorsement • Worldwide Coverage Endorsement • Professional Liability (Errors & Omissions) • Workers' Compensation • Commercial Umbrella • Commercial Auto • Employment Practices Liability • …And Many More
Business Owner's Policy – Midsize Business	• Packages Property & Liability Programs • Commercial Auto • Commercial Umbrella Liability • Inland Marine • Workers' Compensation

Midsized businesses

Hanover allocates underwriters and agents to better understand the uniqueness of each midsize business, its marketplace and the challenges. The coverage for midsized businesses is outlined below.

Table 4 - Midsized Business

Coverage Type	Details
Business Owner's Policy	• Proprietors • Growing enterprises • Larger smaller business
Packaged Property & Liability Programs	• Buildings and other assets • Crime • Equipment breakdown
Commercial Auto	• Company-owned cars, trucks, garages and service operations
Commercial Umbrella Liability	• Increases the coverage provided by your primary liability policy
Inland Marine	• Accounts receivable • Valuable papers records • Items and goods in transport • Computer equipment and electronic data
Worker's compensation	• Funding options • Managed care • Claims handling • Loss control • Return-to-work capabilities

Inland and Ocean Marine

Hanover provides custom-tailored insurance protection, taking advantage of Marine Specialists, a Marine Underwriting Center, Ocean Cargo Mangers, Marine Specialists and Loss Control experts. Regardless the complexity of the situation, Hanover is able to provide a unique solution that will satisfy the needs.

Performance and Surety Bonds

Hanover uses its experience obtained over more than 150 years to provide insurance for products such as Contract Surety, Commercial Surety, and Commercial Crime, implementing technology that allows clients to transact many Commercial Surety Bonds online in real time. This allows Hanover's clients to provide Bond protection, extraordinary service, and a quick turnaround for their own clients.

Institutional Investments

Opus Investment Management provides investment management services to insurance companies, pension plans and other institutional investors. Services are offered to traditional and alternative insurance entities, corporate retirement funds and benefit programs, public retirement funds, foundations and endowments, mutual funds

The Hanover Technology Group (HTG)

The Hanover Technology Group (HTG) provides information services for The Hanover. Michael Clifton, the Chief Technology Officer of The Hanover, manages HTG. HTG provides The Hanover with the necessary tools to run its business. This includes services such as networking, telecommunications and technical support. This is called the baseline section of HTG as it is just the essentials of what the Hanover needs. David Trigo, Sue Trombley, and Cilsy Harris are the Business Delivery Vice Presidents of the Corporate, Commercial Lines and Personal Lines, respectively. In order for them to make accurate and precise decisions, they need to be able to obtain reports on current performance across many divisions. Our group will be focusing on providing a tool that will help document current reporting practicing, allowing the MIS team at Hanover to simplify them and increase accuracy by reducing manual procedures.

Business Process Re-engineering

Business process reengineering is changing the fundamental way in which the organization operates. Based on the research on the old mythology, technology and activity, business Process Reengineering focus on the new solution for the problems.

One of the purposes for this project is to gather data to support the request for funding for the MIS team at Hanover in next year. Through the interviews with Hanover employees and the documentation of business processes, the common data sources and sub-processes can be tracked, setting the stage so the To-Be system can be introduced.

Identify Business Processes

This was the first step of the process, in which pain-points were noted when producing various reports. The main objective was to identify the reports that needed to be addressed first based on its importance for the business and its rating on how "painful" it was to produce it.

Document the Process

The next step was to document the processes with the highest relevance and pain-points score. Based on the documentation provided on how data is extracted and manipulated, a dataflow was created for each of the processes to better understand the data overlap and commonality across the processes.

Measure and Analyze the process

After documenting the process, the next step was to measure and analyze the process. It was very important to understand each process from an MIS perspective. This step allowed the MQP team to better understand the Hanover business users' needs and requirements when extracting data for their reports.

In this step, the MQP team was able to quantify data overlaps, and procedures commonalities that helped prioritize and address the most important concerns for Hanover employees by deploying a technological solution.

Business Process Reengineering

In this step, we focused on the new data architecture to centralize the data and improve the data quality in order to provide the users with partially or fully automated processes. The

following chart shows the Business Process Reengineering (BPR) activities for the MIS team and business users at Hanover.

Table 5 - Business Process Reengineering

Audience	BPR Activities	Focus	Purpose
MIS team at Hanover	Outcome Analysis	Automated Reports	Centralize the data the Hanover employees utilize on a regular basis
	Technology Analysis	Minimize data redundancy	More straight-through processing and prevent human error
	Activity Elimination	Eliminate home-grown databases	Reduce the number of databases containing key business information that are not maintained by HTG
Hanover business users	Outcome Analysis	Accurate Business Information	Produce reports with higher accuracy in less time
	Activity Elimination	Expedite the process of creating the reports	Reduce unnecessary steps when producing a report

Process Documentation Repository & Datapedia

At the very core of this project, as in the entire field of business intelligence; is data. Without data, we as a society would not be able to function. However, data can be defined as raw, un-summarized, and unanalyzed facts. It is up to the user to turn this data into *information* in order to make a decision. Information can simply be thought of as data that has been put into a meaningful form that conveys significance to a user. An integrated tool that can query the various aspects of the processes within the company is big help with data normalization and data integrity.

As such, we have designed a database that manages process documentation, company source information, home-grown source information, and the summary data that connects the processes and source. (To clarify, a 'home-grown' data source is any source that lives on only one person's computer or one group's server. It is inaccessible to the entirety of the company or department.) This 'Process Documentation Repository', as we have so-accurately named it will act as a guide for the MIS team at Hanover to continue the documentation and also help the Business Intelligence team move forward with potential projects in the near future.

The tool we provided is expected to take data and organize it into information. The executives at Hanover will be able to sift through the various business processes and, for example, pick out which areas are most important or possibly which areas need to be updated. Once they obtain this information, they will possess the knowledge to make intelligent business decisions. Without this capacity to use the information, the processes simply appear as a jumbled mess on various pieces of paper.

As a complement to the tool, we have also utilized an existing collection of wiki-pages on a SharePoint site at Hanover called 'Datapedia'. Datapedia contains information about most key company data sources and the main reports related to them. David Doe, who is the administrator of this SharePoint site, is strongly pushing for documentation of as many sources and as many processes as possible. Since our project documented processes anyway, this provided us a perfect avenue so that we could display the results of our work for the general public. Not everyone will have access to the tool we built, but everyone at the company does have access to Datapedia so that they can keep up with any changes made during the BI Initiative.

All in all, through the use of our tool and documentation Hanover will be able to consolidate the processes data into usable information. And thus, it allows upper management to gain understanding on the topic in order to make further vital decisions in their Business Intelligence Initiative based on the original data.

Chapter 3: Methodology

Project Plan

Following best practices, any project that involves the development of a system must be put through the Systems Development Life Cycle (SDLC). The SDLC is used in many areas of business, including systems engineering, information systems, software engineering, and many more. Its purpose is to product a high quality system that will meet or exceed the expectations of the customer (Dennis, Wixom, & Roth, 2009). The four phases of the SDLC are planning, analysis, design, and implementation. Each phase requires a different level of emphasis, but all must be carefully considered in order to produce the desired result.

For this project, we followed the SDLC it to guide ourselves through the development of a tool that to help The Hanover Insurance Group organize their business processes, and use this data to obtain meaningful information. Table 6, displayed below, outlines the four phases of the SDLC, as well as each step within that phase, the technique used by the team, and the deliverable produced.

Table 6 - Methodology

Phase	Step	Technique	Deliverable (for both Hanover and MQP)
PLANNING	Identify the problem	Speak to BI team for requirements	Introduction
	Gather background information	Research Hanover: history, business type, etc.	Literature Review
	Examine feasibility	Three types: technical, economic, organizational	Feasibility Analysis
	Create a timeline	Identify all tasks, estimate time needed per task	Timeline (Gantt Chart)
	Staff the project	WPI Student Team	Staffing Plan
	Manage and execute project	Clarify project scope and recognize potential risks	Project Scope, Risks and Constraints
ANALYSIS	Collect business / system requirements	Interview employees, document business processes	System Requirements, System Definition
	Create various use cases	Develop use case analyses	Use Cases

Phase	Step	Technique	Deliverable (for both Hanover and MQP)
	Model system processes	Diagram data flows for processes	Process Models
	Model data / information	Create entity relationship model, normalize data	Data Models
DESIGN	Design system architecture	Select hardware and software, select database format	System, Architecture Report
	Design user interface	Consider use scenarios, then structure interface	Interface Design
	Build initial prototype	Develop prototype structure and data contents	Alpha Prototype
	Test user interactions	Usability testing, evaluate with heuristics	Prototype improvements
	Build final prototype	Apply prototype improvements	Final Prototype
IMPLEMENTATION	Generate training materials	User processes, data definitions, etc.	User Training Manual
	Project hand-off	Set up for addition of new processes, etc.	All compiled system information documents

Scope

As mentioned before, the Hanover Insurance Group was pursuing a Business Intelligence Strategy in order to centralize extraneous data to improve various business processes by straight-through-processing. This initiative was a very large undertaking, and given our time frame, it was impossible to take on the entire project. Therefore, the scope below defines the deliverables and the limitations of the project for the WPI Student Consulting team.

Planning and Analysis

We documented approximately fifteen business processes to analyze the high-level requirements. This involved scheduling meetings/interviews with a total of seven department heads (or their designated employees) to better understand process and data flows. Also, we requested that a pre-requisite form Appendix B – Business Process Flow Preparation Form be filled out prior to each meeting, so that our team could guide topics of conversation in the

appropriate direction. In these meetings, we met with various company personnel to inquire about process inputs and outputs, as well as the various data sources utilized. Once the meetings were finished, we documented these processes using the pre-requisite form as well as a process flow diagram in Visio.

In order to understand the business processes within the company, we identified various sources of data within the company and all related attributes to fully understand all business processes. Then, we researched all company terminology so that all terminology and acronyms are recorded appropriately within the tool. Once familiarized, we examined and familiarized ourselves with the aspects of similar systems at Hanover. Finally, we created consistency among all documents and process flows so that the eventual tool contains good data.

From the meetings with the departments we were able to gather and understand the requirements from the business perspective on what information they use currently, and how they would prefer the system to be displayed. On the technical aspect of the project, we met on a weekly basis with Kim Killeen, Director of MIS at Hanover, to discuss the technical requirements and feasibility of the project.

Development

The first step in development was to design the tool. We used information gained from documentation to create an Entity Relationship Diagram (ERD) for a database to house the data. Once our first draft was complete, we met with Kim Killeen to confirm entities and attributes were accurate, and revised the ERD as necessary. Upon completion of the ERD we created sample interfaces using sketched screenshots to display the intended functionality of the database and the linked SharePoint site. Before building the prototype, we completed a cost-benefit analysis of our linked system to portray the value that our system will add to the company.

After each of the above steps was completed, we then created the prototype. The prototype encompasses various use cases and handles a few use scenarios to clearly demonstrate how a user can navigate through the system and acquire the necessary information desired. The interface shows important high-level information on the front-most level for simplest use.

In summary, we documented fifteen business processes. Then, we created a database that includes data elements from the process documentation. This database has an intuitive interface to be used by Kim Killeen and other members of the MIS team at Hanover. They will use it to generate basic statistics as well as add/edit/delete information as the Business Intelligence Initiative moves further. Some statistics include: number of data sources used in each process, common data elements used in multiple systems, etc. Also, we linked the database to Datapedia, a SharePoint site of wiki pages which already exists at Hanover, in order to allow employees to follow the progress of the Business Intelligence initiative as it relates to their business processes. Users can track the sourcing of data and all impacts to their processes using our additions to the Datapedia wiki page at Hanover. Unlike the MIS team at Hanover, however, the business users cannot manipulate the data in the database; they can only generate and view reports.

System Prototyping was used to develop the prototype of the tool. System Prototyping methodology smoothens the transition from the prototype to the tool itself. With system prototyping users were able to evaluate a simplified version of the tool and give us feedback on how to tailor it for Hanover needs. The phases of analysis, design, and implementation were performed concurrently to produce simple versions. Based on the feedback obtained from the users, a more complete and less faulty versions of the tool were developed and then submitted for feedback once again.

In order to ease the transition and ensure full utilization of the tool, the MQP team provided training to the MIS staff and potential users for the new tool. Documentation of the prototype was provided to the MIS staff. This documentation includes the prototype training manual, as well as SQL code in case they wish to implement the prototype in another SQL environment other than the one of the prototype we built. Both the findings from interviews, process documentation, and the tool were presented to the sponsors of the Business Intelligence Strategy on December 14.

Deliverables and Timeline

Table 7 lists each core deliverable for the project and the deadline by which it was due.

Table 7- Deliverables and Timeline

Deliverable (for both Hanover and MQP)	Deadline
Proposal Presentation	October 5th
Process Documentation and Flows • ***Interview various employees about their processes*** • ***Create process flow diagrams and review with aforementioned employees*** • ***Compile pre-requisite form and process flows onto the project SharePoint site***	November 2nd (November 9th if any meetings need to be rescheduled)
Prototype of Tool • ***Exhibit a few use scenarios*** • ***Ensure all sections of the database and SharePoint site are intuitive to use*** • ***Conduct user-testing to gain feedback on potential bugs or problem areas*** • ***Revise tool based on user comments***	November 16th (This will allow time for user testing and feedback, then possible revision of the tool for November 23rd-30th
User and Technical Manuals • ***Will include: step-by-step guide for previously discussed use scenarios,*** • ***SQL/VBA code for easy transition to other universe if desired,*** • ***Screenshots to aid visually in execution of various tasks***	November 30th
Final Draft (MQP Paper)	December 7th
Final Presentation to sponsor	December 14th

Work Plan

Figure 2 shows the general work plan for both the project at Hanover (top), as well as the academic portion for WPI (bottom). Each major task in the project plan had numerous steps. Even if each student was not involved in each step, the overall task as a whole was completed by all students. For example, during the "gathering requirements" stage, each student may not have attended every meeting, but the task itself was completed through input of all three students.

Timeline

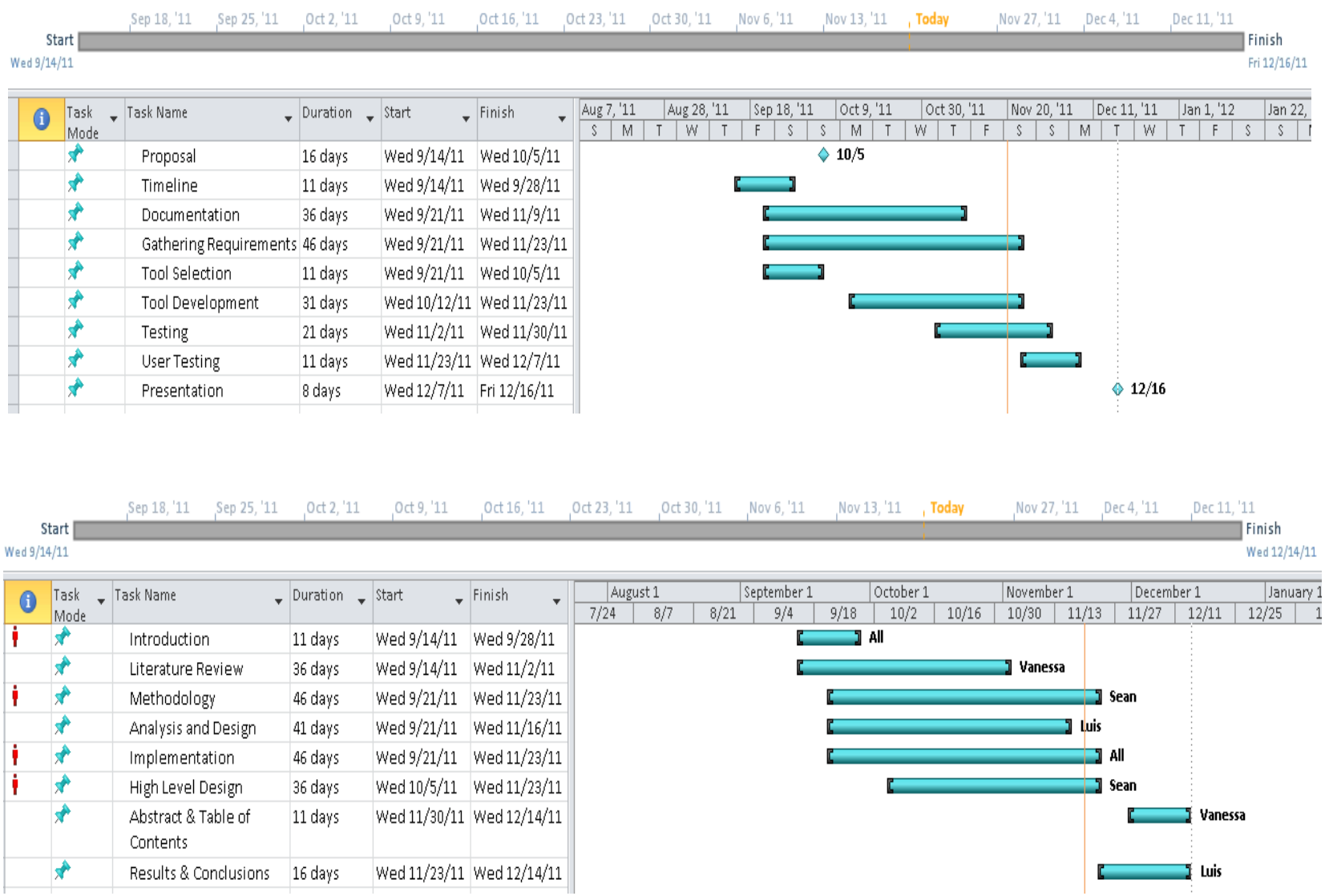

Figure 2- Timeline

Staffing Plan

The following section reviews the project-related skills and experience that each team member has amassed through years of hard work and dedication, to the date of this report. The section also provides the project sponsors with confidence that the project will be completed (at the very least) to their expectations.

Sean Burke

Sean Burke is majoring in Management Information Systems and is minoring in Computer Science. Courses such as Business Data Management, Achieving Strategic Effectiveness, and Human Computer Interaction have all given him unique skills that will assist in creating a user-friendly interface during the development of the tool. In addition to his coursework, Sean is employed by Communispace; a market insight and research firm located in Boston, MA. His projects there have put the concepts he has learned in the classroom into real-world situations which has prepared him for the business environment at Hanover.

Wenxuan Guo

Wenxuan Guo is Management Information Systems major and she seeks to obtain her minor in Actuarial Mathematics. She is taking on her MQP in only her third year at WPI, which is a great example of her study and work habits. In addition to her dedication to the project, classes such as Information Systems Management and Systems Analysis and Design will provide the knowledge and skills necessary to produce a great end-product.

Luis Quiroga

Luis Quiroga is double-majoring in Management Information Systems and Industrial Engineering. This is a great combination because he can understand both the flow of business processes and the technology and data that go into each part of each process. His coursework in Systems Analysis and Design, Business Data Management, and Information Systems Management will all assist him is getting this project done. In addition, he interned for Goldman Sachs in New York City for two consecutive summers. This job gave him the experience to work in a fast-paced environment, and also work with Visual Basic for Application and other tools to enhance business processes.

Stakeholder List and Roles

A successful project is not only measured by the project sponsors and grade from the faculty advisor, but it also needs to meet the expectations and needs of the stakeholders for the project. Each individual who contributes to the project or will be affected by the project is a stakeholder. The most notable stakeholders are the project sponsors, the WPI student team, the faculty advisor, users of the future tool, and the various points of contact within the project. The pertinent information about each stakeholder is listed in Table 8.

Table 8 - Stakeholders

Name(s)	Title, Department	Project Role	Responsibilities
Karen Winsky	Program Director of IP Quality Assurance	Project Sponsor	• Project reporting • Provide high-level requirements • Review status throughout
Cilsy Harris	VP Hanover Technology	Project Sponsor	• Project reporting • Provide high-level requirements • Review status throughout
Kim Killeen	Director of MIS at Hanover	Project Sponsor, Student Consultant Manager	• Project guidance • Assist students will any difficulties • Review deliverables at certain stages
Lisa Voellings	AVP Financial Systems	Project Sponsor	• Project reporting • Provide high-level requirements
Sean Burke Wenxuan Guo Luis Quiroga	WPI MQP Team	Project Managers, Project Team	• Documentation of various business processes • Create process flow diagrams • Create a database with interface to contain and manage data • Develop user-friendly tool for employees to access information
Professor Djamasbi	WPI MQP Team Advisor	Faculty Advisor to project team	• Keep track of team progress • Provide guidance throughout the process • Review all deliverables

Name(s)	Title, Department	Project Role	Responsibilities
Jillian McMillen	Business Analyst, HTG	Worked on project prior to WPI team	• May take over project when our portion is complete • Sit in on some meetings to provide guidance
David Doe	Mgr. Business Solutions, DBA's and Architects	Manages Datapedia (the SharePoint site where employees can see results of project)	• Give recommendations on how to incorporate project with Datapedia • Provide other general project guidance
Linda Brench	Business Analyst, HTG (Contractor from Keane)	User, WPI team consultant	• Sit in on documentation meeting to clarify the terminology used in the company • Provide general project guidance
Robert LaChance	VP Field Finance & Analytics	User, Employee Contact	• Primary employee contact for specific business processes
Eric Naglieri	Mgr. Data and Analysis, CL Actuarial	User, Employee Contact	• Primary employee contact for specific business processes
Susan Gildea	VP Lead Actuary, Actuarial Emerging Business	User, Employee Contact	• Primary employee contact for specific business processes
Jeremy Jump	VP Lead Actuary, PL Actuarial	User, Employee Contact	• Primary employee contact for specific business processes
Pamela Hardina	Lead Financial Analyst, P&C Finance	User, Employee Contact	• Primary employee contact for specific business processes
Aaron Bender	Mgr. Data and Analysis, PL State Mgmt. – Core	User, Employee Contact	• Primary employee contact for specific business processes
Catherine Eska	VP Lead Actuary, Corporate Actuarial	User, Employee Contact	• Primary employee contact for specific business processes
Assorted Employees	Various	Users	• use the system put in place by WPI student team

Feasibility Analysis

The following section analyzes the overall feasibility of the project. The three criteria taken into consideration were technical feasibility, economic feasibility, and organizational feasibility. The detailed descriptions and analyses are discusses below.

Technical Feasibility

The technical feasibility is split into multiple parts. Each of these parts answers the question "Can we build it?" (Dennis et al., 2009). The five sub-sections of technical feasibility include technological capability, application capability, technological familiarity, compatibility, and project size. Each sub-section is outlined below.

Technological Capability

The Hanover Insurance Group uses numerous pieces of software on a daily basis to carry out business processes. In relation to our project, they use a variety of tools to source, query, and report data. Tools like MS Access and Oracle databases are used to house data in various warehouses and universes, while applications such as SQL Server and Hyperion can be used to query the data to acquire the necessary data within a process. Finally, Microsoft Excel and Microsoft SharePoint are often used as reporting tools across various lines of business.

Application Familiarity

The employees within the Hanover Insurance Group all work with these various tools and applications every day. In some cases, an employee must carry out multiple business processes that could all involve more than one of the applications mentioned in the previous paragraph. The MIS team at Hanover is more than capable of handling any tool we may create, provided that we can supply proper documentation.

Technological Familiarity

The MIS team at Hanover consists of the go-to experts for any technology and data source used in Hanover. As the consultants for the project, it is our job to make the adaptation to the tool simple and seamless. We shall provide an intuitive interface, detailed documentation, and helpful, in-depth training to all necessary employees so that the organization is able to progress further with their Business Intelligence Initiative using the technology we have supplied to them.

Compatibility

The system will be definitely compatible with technologies that already exist in The Hanover. The information that will be included in the tool is already available at The Hanover, and so it is the infrastructure to display it. Considering we will only be producing a prototype of the tool, the aspects that will require the most attention are the technical documentation and user training.

Project Size

Given the time frame and scope of the project, the three WPI team members are sufficient to implement the solution for the problem at hand. Once we hand-off the project, David Doe the Manager of Business Solutions DBA's and Architects, will be responsible for the Datapedia portion of the system. Kim Killeen and delegated members of her team can manage the system. Lastly, either Linda Brench or Jillian McMillen (or both) can carry on with the documentation meetings. All in all, the hand-off of the project was seamless with very little effort from Hanover.

Economic Feasibility

The following section outlines what Hanover should expect in terms of monetary value of our project. Based on best practices, we chose to analyze the project on a 5-year time table (Dennis, Wixom, & Roth, 2009). The costs, benefits, and other important economic feasibility metrics are shown below in Table 9.

Cost-Benefit Analysis

Table 9 - Cost benefit calculations

	2011	2012	2013	2014	2015	Total
Development Costs						
Software developer salaries	0.00	15384.62	15384.62	0.00	0.00	30769.23
WPI MQP Project fee	10000.00	0.00	0.00	0.00	0.00	10000.00
Training	540.87	0.00	0.00	0.00	0.00	540.87
Hardware and Software	0.00	0.00	0.00	0.00	0.00	0.00
Data Conversion	0.00	192.31	0.00	0.00	0.00	192.31
Operational Costs						
Hardware and Software	0.00	0.00	0.00	0.00	0.00	0.00
Software developer salaries	0.00	1884.62	1884.62	923.08	923.08	5615.38
Communication	0.00	1081.73	1081.73	1081.73	1081.73	4326.92

	2011	2012	2013	2014	2015	Total
User Training	0.00	925.48	925.48	925.48	925.48	3701.92
TOTAL COSTS	*$10,541*	*$19,469*	*$19,276*	*$2,930*	*$2,930*	*$55,147*
Reduction in IT costs	1153.85	0.00	0.00	0.00	0.00	1153.85
Identify reporting improvement opportunities	680.77	0.00	0.00	0.00	0.00	680.77
Improve quality and consistency of data impact analysis	283.65	0.00	0.00	0.00	0.00	283.65
Reduction in labor from manual work in reporting	0.00	46153.85	69230.77	69230.77	69230.77	253846.15
TOTAL BENEFITS	*$2,118*	*$46,154*	*$69,231*	*$69,231*	*$69,231*	*$255,964*
Total Benefits - Total Costs	***-$8,423***	***$26,685***	***$49,954***	***$66,300***	***$66,300***	***$200,818***
Cumulative Net Cash Flow	***-$8,423***	***$18,263***	***$68,217***	***$134,517***	***$200,818***	

Break Even Point	4 months
Return on Investment	364.15%
Net Present Value	$174,120.25

Assumptions

The following section addresses the assumptions made by the MQP team to generate all the figures in the cost-benefit analysis. The assumptions are listed (for the most part) in the same order as their respective monetary values in the table. Also worth noting, the estimated salaries of employees that will eventually work on the new system are taken from GlassDoor.com.

In 2011 there will be no development costs since the MIS team at Hanover will not be implementing the system until the following year. In 2012 and 2013 they will begin development of a system based on our prototype. It costs the development team time to create new resources and we must account for this in our analysis.

Based on information obtained from GlassDoor.com, the average business operations employee makes about $80,000 per year. This would translate to about $38.46 per hour. These

employees should expect the total hours to allocate to development per year would be about 400. This figure is based largely on personal experience. Through summer internships, we gained experience in certain aspects of software development, including the timeline. Due to the amount of current data stores, and the amount of expected time for development, 400 hours of work seems logical. Therefore the monetary value is 400 * 38.46 = 15384.62.

In order to pass the system off, we were required to train at least one user on the prototype. This training would take approximately 10 hours and we are assuming a salary of about $112,500 per year (approximately $59.09 per hour) for a Director-level position at Hanover (GlassDoor.com). Finally for development, we assumed it would take only 5 hours for an employee to do the data conversion from our prototype to whatever the final system happens to be. Again, this data analyst / business operations employee is assumed to have a salary of about $80,000 per year ($38.46 per hour).

For operational costs; maintenance of the system will begin in 2012. We are assuming that general maintenance of the system should only consist of 24 hours per year. This assumes an employee at Hanover will spend about 2 hours at the end of each month updating the system and performing general maintenance if necessary. In addition, during 2012 and 2013 Hanover still needs to feed in the rest of the process documentation information. Based on personal experience and the amount of processes remaining, it should take an employee at Hanover about 50 hours to complete the documentation process. This number will be split over 2 years assuming they wish to take their time in completing the documentation. Again, we are assuming the aforementioned tasks will be executed by an employee making a salary of $80,000 per year ($38.46 per hour).

In terms of communication to the average business user, we assume it will take the administrator of Datapedia approximately 20 hours per year to manage the upkeep of the site specifically in regards to our portion of the site. This is based on the amount of time it took us to edit a wiki-page that already exists on the site. Finally for operational costs, we assumed there would be one trainer and about five people being trained on the new system. We estimated the trainer (Director-level) would have a salary of about $112,500 per year ($54.09 per hour) and the trainees again would be at about $80,000 per year ($38.46 per hour). This assumes that the

trainees would be data analysts / business operations employees. We assumed there would be approximately 10 hours' worth of training sessions to be fully competent with the new system.

Now switching over to benefits, one key benefit is the overall reduction in IT costs that Hanover will save using our system. If they had to attempt to do this project from scratch, we assumed it would take approximately the same amount of time it took us to design the system and build it into a working database. In total this was about 30 hours and we assumed the employee at Hanover who would take on this task would again be a data analyst / business operations employee. Another benefit to consider is the fact that we are saving them time from doing the documentation and we are helping to identify reporting improvement opportunities. If they had done these themselves, we assumed that they would utilize a data analyst with less than three years' experience. This way, the employee becomes acclimated with the company processes faster and also Hanover completes the documentation efficiently. Again using Glassdoor.com, we are assuming the documentation employees earn approximately $59,000 per year ($28.37 per hour). Our team took 24 hours to complete this portion of the project.

Another benefit for Hanover is that we are improving the quality and consistency of their documentation for future use and its impact of data analysis. We spent approximately 10 hours going through all the documentation and process flows to ensure consistency and data integrity for all information within the PDR. If Hanover was to do this using their resources, they would again assign the new data analyst to the task with an approximate salary of $59,000 per year ($28.37 per hour).

The final and most important benefit of our system is improving the reporting processes through reduction of overall manual labor. Once the BI initiative finds opportunities for improvement in the various areas of the company, each of the business processes documented have the potential for extreme time differences in manual labor. Time to complete a process can take anywhere from one day to two weeks. The frequency in which processes are executed varies as well. After taking those facts into consideration and analyzing our sample size (approx. 20-25 processes), we determined that each process could realize an average of 24 hours saved per year. In 2012, we assumed Hanover will complete half of the remaining processes on the list and

therefore would see a savings based only on 50 total processes. In 2013 and beyond, they will see a savings from a total of 75 processes assuming that the process documentation is complete and the BI initiative continues to run at its optimal potential. The employees completing these processes would range from associate actuaries to business analysts to lead financial analysts. After reviewing the salaries on GlassDoor.com, we averaged a few different salaries and the average came out to $79,000. We rounded this to $80,000 (again $38.46 per hour).

Organizational Feasibility

The following section answers the question: "If we build it, will they come?" (Dennis et al., 2009). We analyzed if the system will be adopted by the potential users. Also, we needed to be sure the design will be approved by the leaders of the Business Intelligence Team. These two groups were very important to the success of the newly developed system.

The goal of the Business Intelligence Initiative at Hanover is to reengineer business processes throughout the organization through the use of technology. The Business Intelligence Strategy is being sponsored by the Chief Financial Officer at Hanover, thus, implementing the initiative through a top-to-bottom approach. The Hence, the system developed by the MQP team is planned to be utilized after our departure.

Conclusion

Taking the recent sections into consideration, we determined that the development of this system was feasible. The Hanover Insurance Group may not benefit financially from the project in the short-term; but in the long-run, this project will provide numerous benefits that will assist the organization in its business operations for years to come.

Risk Assessment

Table 10 - Risk Assessment

Risk	Risk Level	Impact	Description
Professor Review Delay	High	High	Professor Djamasbi must review our deliverables throughout the course of the project. She has many other responsibilities at WPI and therefore a delay should always be anticipated.
Presentation Scheduling Conflicts	High	Low	Kim Killeen, Lisa Voellings, and Cilsy Harris each need to be present for our presentation. They

Risk	Risk Level	Impact	Description
			all have busy work schedules on a daily basis and a delay may arise if they cannot attend a scheduled presentation time.
Employee unavailability	Medium	High	Meeting with various employees is how we will document the various business processes. If any of the meetings need to be rescheduled for any reason, the documentation will take even longer than expected.
Prior document consistency	Medium	High	Before we took on this project, approximately nine business processes were already documented. In order for our tool to be effective, this documentation will need to be consistent with our documentation to ensure data integrity.
Technology availability for presentation	Low	Medium	If no projector or other technology source is available for the final presentation, it could hinder the quality if the student team is ill-prepared.

Risk Mitigation

The risks listed above have all been recognized and the following section describes the way(s) in which the risks can be avoided or counteracted.

Professor Review Delay

In order to decrease the level of risk, we informed Professor Djamasbi of the status of each of the deliverables related to the project. The agenda and meeting minutes for each of the weekly meetings outlined any review of deliverables if it applies. This way, Professor Djamasbi had ample warning each time she needed to review any piece of the project and allocate her time appropriately.

Presentation Scheduling Conflicts

The best way to avoid scheduling conflicts was to provide significant warning ahead of the determined presentation date. On the original proposal, we outlined a tentative presentation

date, and therefore the project sponsors had that time free. However, as we learned during our proposal presentations, other business meetings ran late which required the WPI team to be prepared for a condensed presentation if necessary.

Technology Unavailability for Final Presentation

During the proposal presentation, our team went into an unknown meeting room and assumed that there would be a computer for us to use. These assumptions were wrong, and we were luckily able to improvise a solution that made for a great presentation. For the final presentation, we attempted to avoid that risk by choosing our own meeting room and then assessing the room for the necessary materials on our part for presentation day.

Employee Unavailability

As with any interview or business meeting, a time had to be arranged that worked for several different groups of people. If, for any reason, a meeting was cancelled or delayed then we were set back at least one week in the documentation process. To reduce this risk, we scheduled meetings during a time frame in which Linda Brench and the designated employee have no adjacent meetings, if possible. This way there was less of a chance a prior engagement will run late and interfere with our project.

Prior Document Consistency

Since some processes were already documented before we took on the project, we needed to ensure that the way things were done were the same as the way they were being done previously. In order to assure this is the case, we went through the prior completed documents and process flows, and analyzed the terminology used within each one. In this way, we maximized data integrity within the database.

Chapter 4: Analysis and Design

The Hanover Insurance Group has processes established to create reports for the different business areas. However, the data about insurance policies is scattered across various data sources. These data sources contain different pieces of information regarding insurance. For example one data source contains policy level information another data source contains quote-level information. In order for the different groups at Hanover to produce the reports they need, they combine the different metrics from the different systems into an Access database or a spreadsheet they constructed themselves.

The current system has a high operational risk for Hanover. The "home-grown" databases and macros constructed by the individual groups are stored on the individual desktops rather than in a centralize location on the network. The MIS team at Hanover has no control over the "home-grown" tools, which means that they cannot ensure it has the proper architecture and manipulation of the data, and they cannot provide the proper maintenance either.

Most of the reports are complex to produce, thus very complex to duplicate. It is not uncommon that a very selective number of employees know the steps to produce a specific report. The processes to produce each report require a lot of manual work, making them high-touch rather than straight through processing. Due to the nature of the processes, mistakes are prone to happen. These mistakes can delay the production of the report since it has to be revised to ensure the report is accurate and error-free.

The MIS team at Hanover is trying to analyze which data is extracted from each data source, and how it is manipulated to produce the reports in each business area. The data overlap will be found in the process flow for each of the reports. Once commonalities are found between data that the different business areas are currently extracting from various systems, then the MIS team at Hanover will be able to centralize the data storage and reduce the number of data sources needed to produce various reports.

The two main advantages from centralizing the data are reducing the number of data sources overall, and reducing the number of home-grown databases. First, by reducing the

number of data sources, all the data will be found in one place which facilities data mining and maintenance of the data stores overall. Second, by centralizing the data the business areas will only need to download the data once and produce the report from that data; the number of home-grown databases and macros should decrease since data does not need to be combined from different data sources.

Analysis Strategy

This section discusses the how we gathered and analyzed the requirements necessary to create a proper prototype for the future system. It mainly addresses the best practices we utilized through the analysis and design phase of this project.

Requirements Analysis Techniques

Joint Application Development (JAD) sessions were held with senior management from each business area. Linda Brench was extremely helpful in guiding the JAD sessions since we, the WPI students, were not familiarized with the processes and business terminology at Hanover. A maximum of three JAD sessions were held on a weekly basis, and an average of two business processes were documented in each session.

After each JAD session, the Visio flow charts were sent back to senior management for accuracy verification and final approval. Any unclear segments of the flow would also be verified once the Visio chart was produced. Senior management was also asked to produce a spreadsheet highlighting all the individual fields that were extracted from each of the data sources to be able to further understand what data each business area needs to produce their reports.

Weekly JAD sessions were also held with Kim Killeen, the director of MIS at Hanover. During each session we would demonstrate our advancement on the tool to store the documentation for each process, in a way that a specific process or data store could be searched, and the data elements pertinent to that system would be shown.

Requirements Gathering Techniques

The JAD sessions helped identify the "pain-points" for each process when producing the reports. By creating consistency in the processes documentation during all the JAD sessions, the overlap of necessary data for various reports was easier to identify.

For each process the data sources would be identified during the JAD session. The process documentation consisted of the flow chart for each of the processes showing the data sources, how the data is manipulated, and the necessary steps that each business area does in order to produce the report. After collecting this information during the JAD sessions, the MQP team designed their respective flow charts in Microsoft Visio.

Questionnaires also proved very effective to gather the requirements. Before every JAD session the interviewees were asked to fill the form that can be found in Appendix B – Business Process Flow Preparation Form, which highlights the audience each report is intended to, it lists all the data sources needed to produce the given report, and it also lists all the data elements and general information that is extracted from each data source. By asking senior management to fill the form previous to the meeting, it allowed the WPI students to better understand the process before mapping it out in the meeting, and it also served as the guide for senior management when describing the flow.

Requirements Definition

Purpose

The purpose of the Requirements Definition is to understand and record the various types of requirements for the development of a tool that will provide with statistics on the data extracted by the different business areas at Hanover, and to provide information on systems and users that will be impacted if another system use is discontinued.

Target Audience

This requirements definition is intended for the following audience at Hanover:

- Project Sponsors
- Business Intelligence Strategy team
- HTG Management information systems team
- Users of data sources which use will be discontinued

Requirements

The requirements necessary for the system are listed in Table 11.

Table 11 - Requirements

Type	Requirement	Details
Functional	Process-oriented	• The system must allow employees in the business area find the new data stores were the necessary data can be found • Inputs and outputs of said processes and their reports
	Information-oriented	• The system must store the previous data sources for a specific report • The system must store the new data sources were the necessary data for a specific report can be found
Non-functional	Operational	• The system has to have the search feasibility for the new data sources used in a specific report • The system has to have the search feasibility for the reports and home-grown databases that are impacted, if a non-home-grown database is removed from the system • The system needs to be able to report basic statistics about the data overlap across various business areas
	Performance	• The prototype should be tested with data from at least 25 documented processes
	Security	• Business users outside of the MIS team at Hanover should not have access to the database
	Cultural and Political	• The system, built in MS Access, should be easy to translate to other environments if necessary

Use Cases and Systems Models

Use Cases

Process 1

Use case name: View/ Add/ modify process information to the database

Process ID: 1 Importance Level: High

Primary Actor: MIS team at Hanover

Short description: This use case describes how to store the business process in the database in order to maximize the efficiency and enable other Business Intelligence decision making functionality

Trigger: MIS team inputs new process to the database

Type: External

Major Inputs:		**Major Output**	
Description	**Source**	**Description**	**Source**
Process list	Business Intelligence SharePoint Site	Stored Information	System
Business process data source and detail information	Business Process Sessions Form		
Data flow Information	Data flow diagram		
Information address	System		

Major Steps Performed		**Information for Steps**
1 Input process to the database	←	Process list
1.1 Find the list of the documented process on the BI SharePoint document	←	Business Process data source and detail information
1.2 If the process is already there, then modify the process information		
1.3 If the process is not on the list in the database, then add that process into the database according to the process Sessions form	←	Data flow information
2 View the process	←	Information address Database with detail Information

Process 2

Use case Name: View/ Modify/Add Data source

Process ID: 2 Importance Level: High

Primary Actor: MIS team at Hanover

Short description: This use case describes how to store the data source information in the database in order to maximize the efficiency and enable other Business Intelligence decision making functionality

Trigger: MIS team at Hanover inputs data source to the database according to the data source information from data flow diagram

Type: External

Major Inputs:		**Major Output**	
Description	**Source**	**Description**	**Source**
Business Process information	Business Process	Stored information	System
Data flow information	Data flow diagram		
data address	System		

Major Steps Performed		**Information for Steps**
1 Input data source to the database		
1.1 determine if it is master data source or home grown data source	←	Business Process information
1.2 Add the data source for to the database	←	Database address
1.3 check mark for final report if it's the final output from this process		
1.4 continues add the other data source for specific process	←	Business Process
1.5 Exit if complete	←	Stored information
2 View the data source		

Process 3

Use case Name: View/ Modify/Add Data summary

Process ID: 3 Importance Level: High

Primary Actor: MIS team at Hanover

Short description: This use case describes how to store the data source information in the database in order to maximize the efficiency and enable other BI decision making functionality

Trigger: MIS team at Hanover inputs data source to the database according to the data source information from data flow diagram

Type: External

Major Inputs:		**Major Output**	
Description	**Source**	**Description**	**Source**
Process list	MIS team at Hanover	Database with detail information	MIS team at Hanover
Business Process Sessions Form	MIS team at Hanover		
Data flow diagram			
Database			

Major Steps Performed		**Information for Steps**
1 Input process to the database		
1.1 Find the list of the documented process on the BI SharePoint document	←	List of documented processes
1.2 If the process is already there, then modify the process information		
1.3 If the process is not on the list in the database, then add that process into the database according to the process Sessions form	←	Business Process Sessions Form Database with detailed information

Process 4

Use case Name: Search or view the report

Process ID: 4 Importance Level: High

Primary Actor: MIS team at Hanover

Short description: This use case describes how search or view the report sorts by different criteria.

Trigger: MIS team at Hanover needs to view the information for data source purpose or need to publish the report on the Datapedia site

Type: External

Major Inputs		**Major Output**	
Description	**Source**	**Description**	**Source**
Stored information	System	list of sorted information by different criteria	System
Switchboard with different sort criteria			

Major Steps Performed		**Information for Steps**
1 Click on the sub form by purpose and criteria	←	Switchboard with different sort criteria
1.1Click the report wanted the view		
2 Print out the report if needed		

Process 5

Use case: Create Wiki page

Process ID: 5 Importance Level: high

Primary Actor: MIS team at Hanover

Short description: This use case describes how to publish the report

Trigger: MIS team at Hanover update the report according to the changes of the process or data source

Type: External

Major Inputs		**Major Output**	
Description	**Source**	**Description**	**Source**
SharePoint address	David Doe	process and data source report	SharePoint Site
Reports	System		

Major Steps Performed		**Information for Steps**
1 Generate report	←	Database
1.1 System generate report according to all the criteria		
2 Publish report		
2.1 Create the link from the Datapedia page	←	SharePoint Process and Data source report

Process 6

Use Case Name: Publish report

Process ID: 6 Importance Level: High

Primary Actor: MIS team at Hanover

Short description: This use case describes how to public the process information on the SharePoint site and how to linked them together

Trigger: MIS team at Hanover inputs process information on the SharePoint site

Type: External

Major Inputs		**Major Output**	
Description	**Source**	**Description**	**Source**
Business Process Sessions Form	MIS team at Hanover	SharePoint Datapedia report	MIS team at Hanover
Data flow diagram	MIS team at Hanover	SharePoint site	MIS team at Hanover
Database information	MIS team at Hanover		
SharePoint Datapedia report prepare form			

Major Steps Performed		**Information for Steps**
1 Get information		
1.1 prepare report from business process sessions form	←	Business Process Sessions Form
1.2 prepare report from data flow diagram	←	Data flow diagram
2 Input information into SharePoint Datapedia report	←	SharePoint Datapedia report prepare form
3 Linked the report page to the existing report title	←	SharePoint Datapedia report
4 If the report doesn't exist on the department page, create one more row for that report	←	SharePoint site
5 Link the data source for that report to the Datapedia		

Use Scenarios

This section describes the use scenarios that were created to further understand the uses of the system.

Use Scenario 1 - Add documentation for a process

The MIS team at Hanover has held a new meeting with business users to understand their reporting procedures, and they would like to add the process information into the database. Add documentation for a process can be done in two ways: directly from the switchboard, or when adding a data summary. The MIS team at Hanover has the option to click the button in the switchboard to add a process, input the information, and then come back to the switchboard. The process information can also be registered from the data summary form were a button will bring the process form up, if the desired process is not listed in the database.

Use Scenario 2 – Add a source

Following up from a new meeting, the MIS team at Hanover realizes that a group in Hanover utilizes a data source that is not entered in our database yet. Same as with the documentation for a process, adding a source can be done from the switchboard directly or from the data summary form. After the user of the tool decides he/she wants to add a new source, they are prompted to decide whether the new source is homegrown or not. Depending on the user selection, they will be guided to the different forms for types of sources; the information in both is very similar overall, where the main difference is that the user is asked to provide more detail for a homegrown source.

Use Scenario 3 – Add a data summary

When documenting the procedure to create a new report, the MIS team at Hanover will want to understand the data that is pulled from both types of data sources and for what purpose. The switchboard gives the user the possibility of clicking the button to enter a new data summary, which brings up the form where the user can select the process and data source for which him/ her is entering all the information. In case the desired process or source is not listed in the database, as described in the previous use scenarios, there are buttons that will take the user to the pertinent form where they can add the process or source to the database.

Use Scenario 4 – Produce reports

When the MIS team at Hanover desires to understand how the sources are being used they can utilize the switchboard to navigate to the form where they can see different reports

displaying different information. They will be able to compare sources utilization for a specific process, or the different processes that involve a data source. Other reports the user has available describe different aspects and information on the complexity of the processes or the data that is being retrieved from the sources.

Data Flow Diagrams

Below is a graphical representation of inputs and outputs for our system. As the level increases the procedures outlined are more detailed for a better comprehension of the data flows in our system.

Context Level

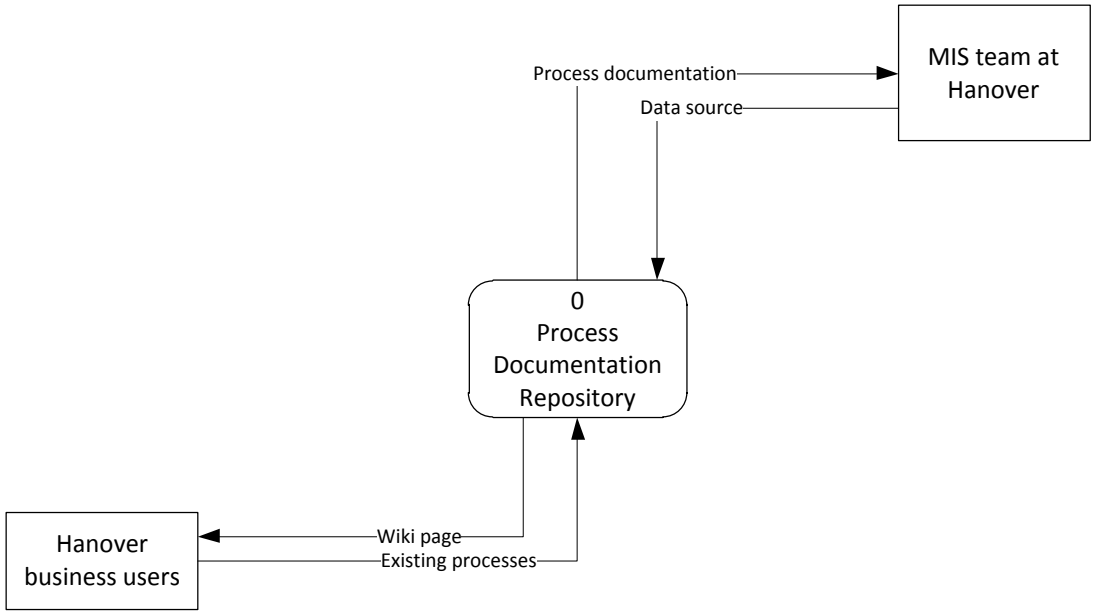

Figure 3 - Context Level

Level 0

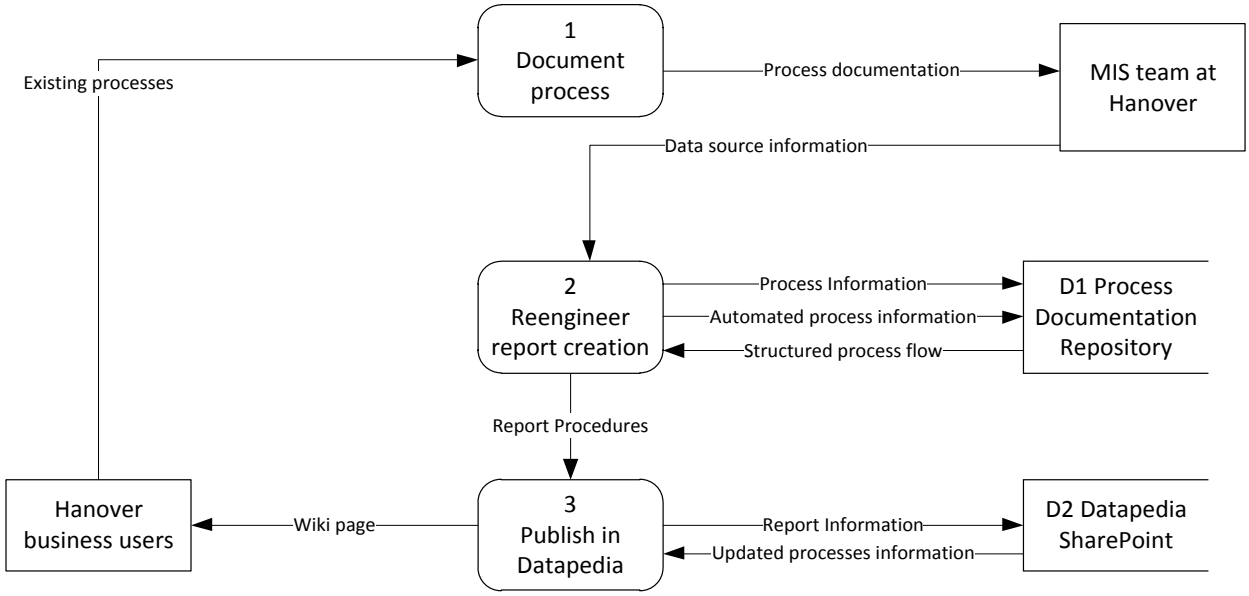

Figure 4 - Level 0

Level 1 – Document Process

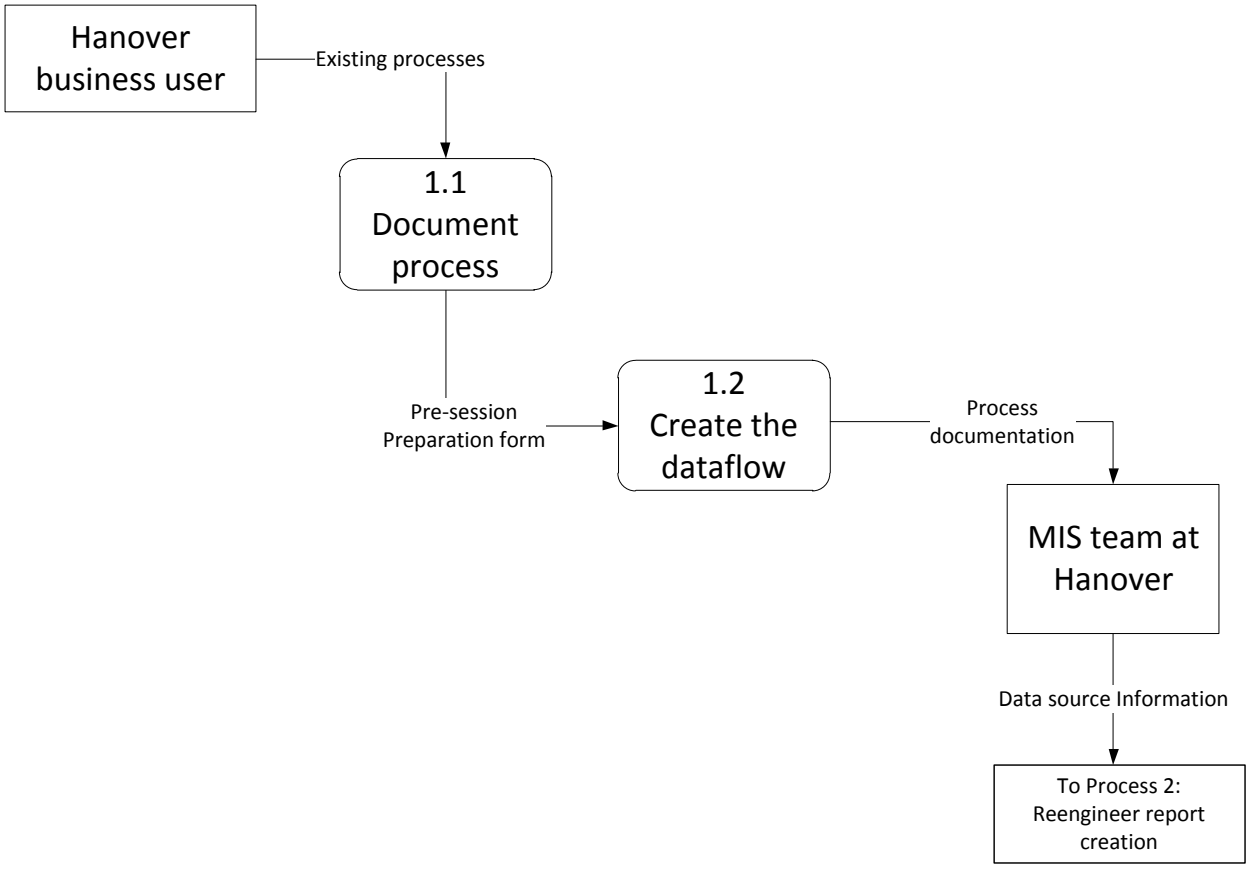

Figure 5 - Level 1 Document Process

Level 1 – Reengineer Report Creation

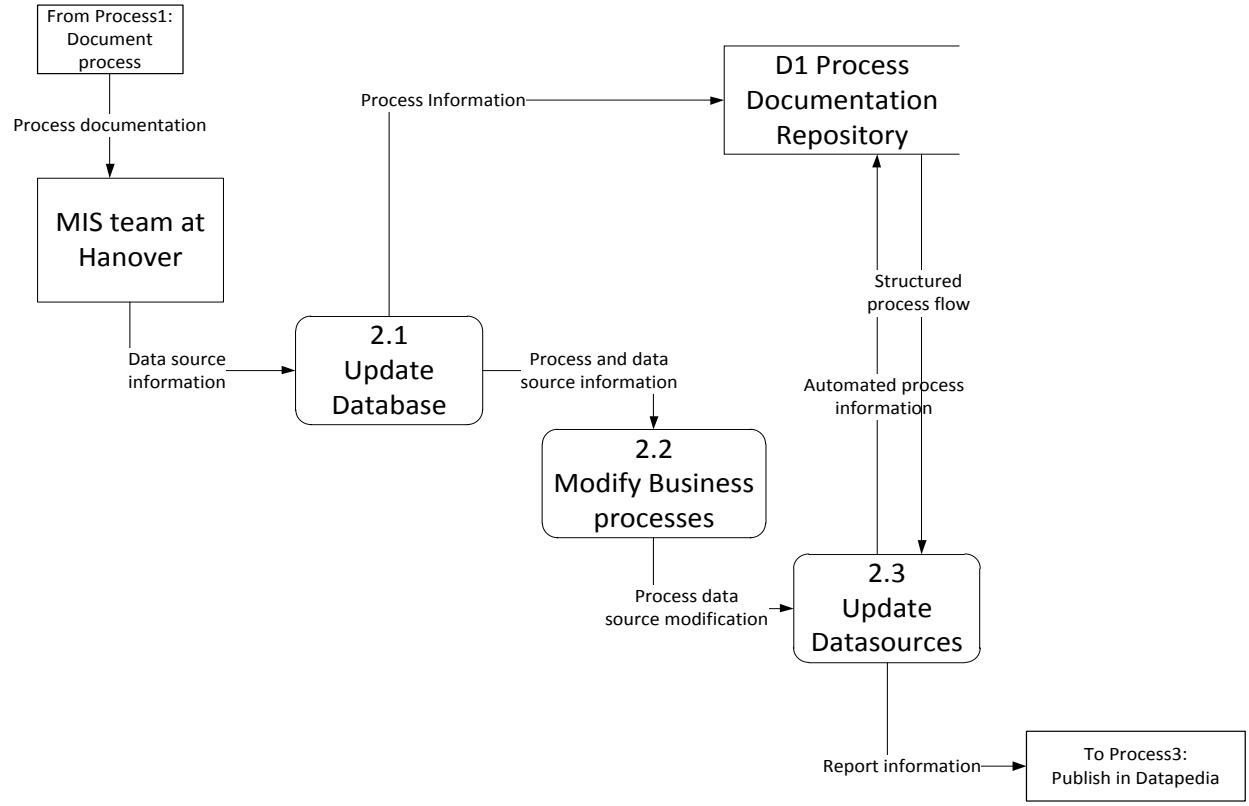

Figure 6 –Level 1 Reengineer Report Creation

Level 1 – Publish in Datapedia

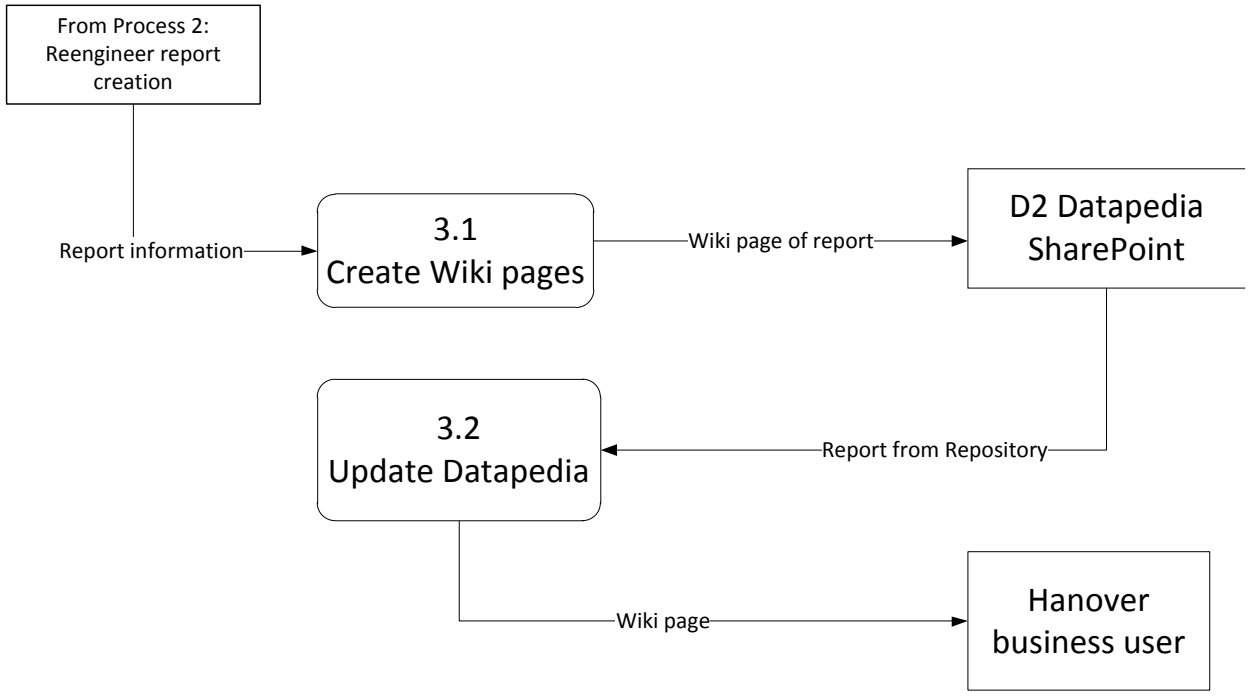

Figure 7 - Level 1 Publish in Datapedia

Chapter 5: Prototype Specification & Implementation

Prototype Specification

This section describes how the WPI student team built the prototype for demonstration purposes, in order to provide the Business Intelligence team with an idea of the To-Be system on how it will look, and the MIS team at Hanover on the capabilities and limitations of the system.

Software

The team built the prototype of the database in Microsoft Access and provided the users with a switchboard for easier navigation when interacting with the system. All the process documentation was uploaded into Microsoft SharePoint, and wiki pages were created to display the information for the users on the business side. As stated in the feasibility analysis, Microsoft Access and SharePoint are commonly used by Hanover employees. In order to demonstrate the full functionality of our system, the prototype of the database was built in MS Access combined with the Datapedia SharePoint.

Design Approach

In order to design the system, the team first analyzed all the data that would need to be included in the tool based on the information obtained in the business processes documentations. To start the construction of the database, the team designed an Entity Relationship Diagram that captures all the necessary data to be able to extract information on all the different systems at Hanover. The Data Flow Diagrams served to understand possible use case scenarios and best identify outcomes of the system and how it should be displayed.

The combination of the Entity Relationship Diagram and the Data Flow Diagrams were very helpful to better implement the database for data storage, and the wiki pages to display information for business users. The screenshots of the database can be found in Appendix E - User Manual Templates of the wiki pages in Datapedia can be found in Sample Process Flow that would be the *result from Prep Form and documentation meetings*

Appendix C - Data Source Documentation Template and Appendix D - Report Documentation. Through the entire process, Kim Killeen (Director of MIS team) served as the main contact and gave us useful feedback when designing the system, and Linda Brench (Business analyst at HTG helped us better understand Hanover's business processes and terminology for a more effective documentation.

Prototype Design

In this section, the Entity Relationship Diagram, the Storyboards, and the User Interface Structure Diagram are described. The Entity Relationship Diagram provided a description of the relationships between the tables of our database. The Storyboards narrated the concepts throughout the different interfaces of our database, and provided guidance on possible interactions the user may have with the system. The User Interface Structure Diagram described how the interfaces of our database are related to provide an efficient design for the system and a user friendly database.

Entity Relationship Diagram

The Entity Relationship Diagram (ERD) for the prototype was based on the information obtain from the form distributed before interviews with Hanover employees, the requirements gathered throughout all the phases of the project, and the feedback received by Kim Killeen since she will take ownership of the system once the system is completed by the MQP team. The ERD is shown in Figure 8.

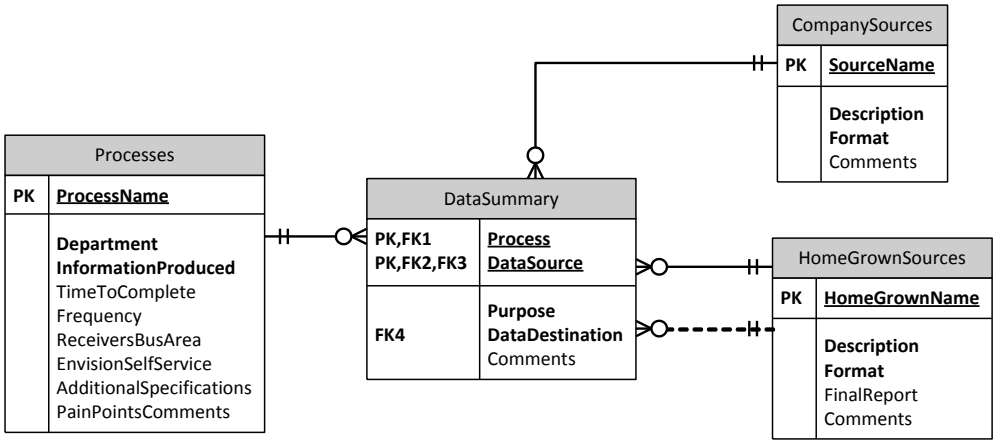

Figure 8 - Entity Relationship Diagram

Entity Relationship Diagram Data Dictionary

Table 12 - Entity Relationship Diagram Data Summary

Terminology	Definition
Process	Information on the process for creating a report created by Hanover employees
Information Produced	The output of the process. A brief description of the information that is being reported at the end of the process
Envision Self-service	A yes/no field to quickly evaluate whether this process can be automated or not
Receivers Business Area	The business are that will be using the report produced
Company Sources	Data sources such as IMART, EDW, etc. that are maintained by the MIS team at Hanover
Format	The format identify the type of the data source such as Access, SQL server, SAS, etc.
Homegrown Source	Data sources such as Access databases and Excel spreadsheets that were created by Hanover employees and are not supervised by the MIS team at Hanover.
Final Report	Whether the output produced by the combination of a data source and a process leads to the report containing all the data after it was manipulated
Pain Points Comments	A quick description of the most strenuous steps when creating a specific report

Storyboards

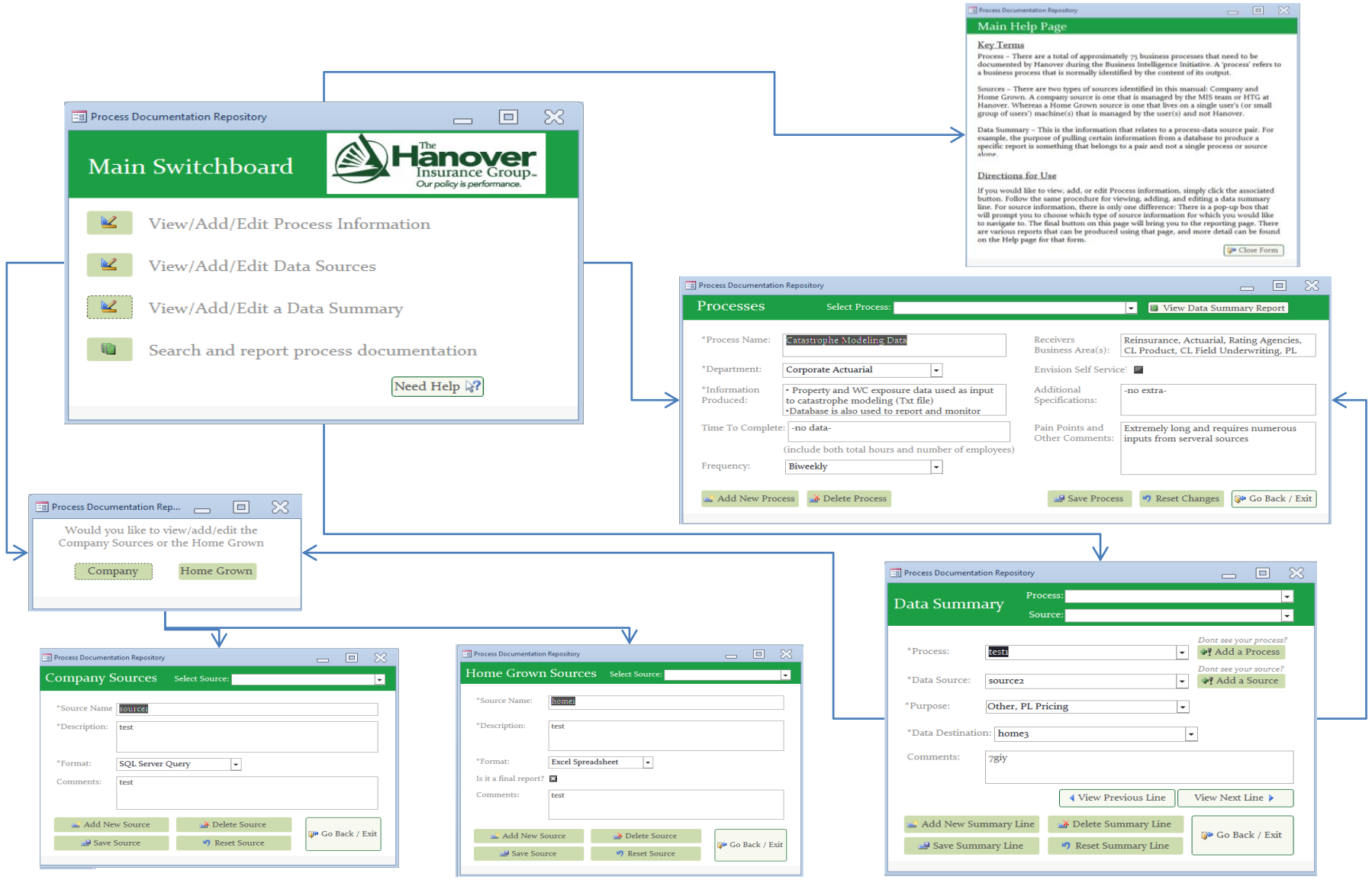

Figure 9 - Main Storyboard

Process Storyboard

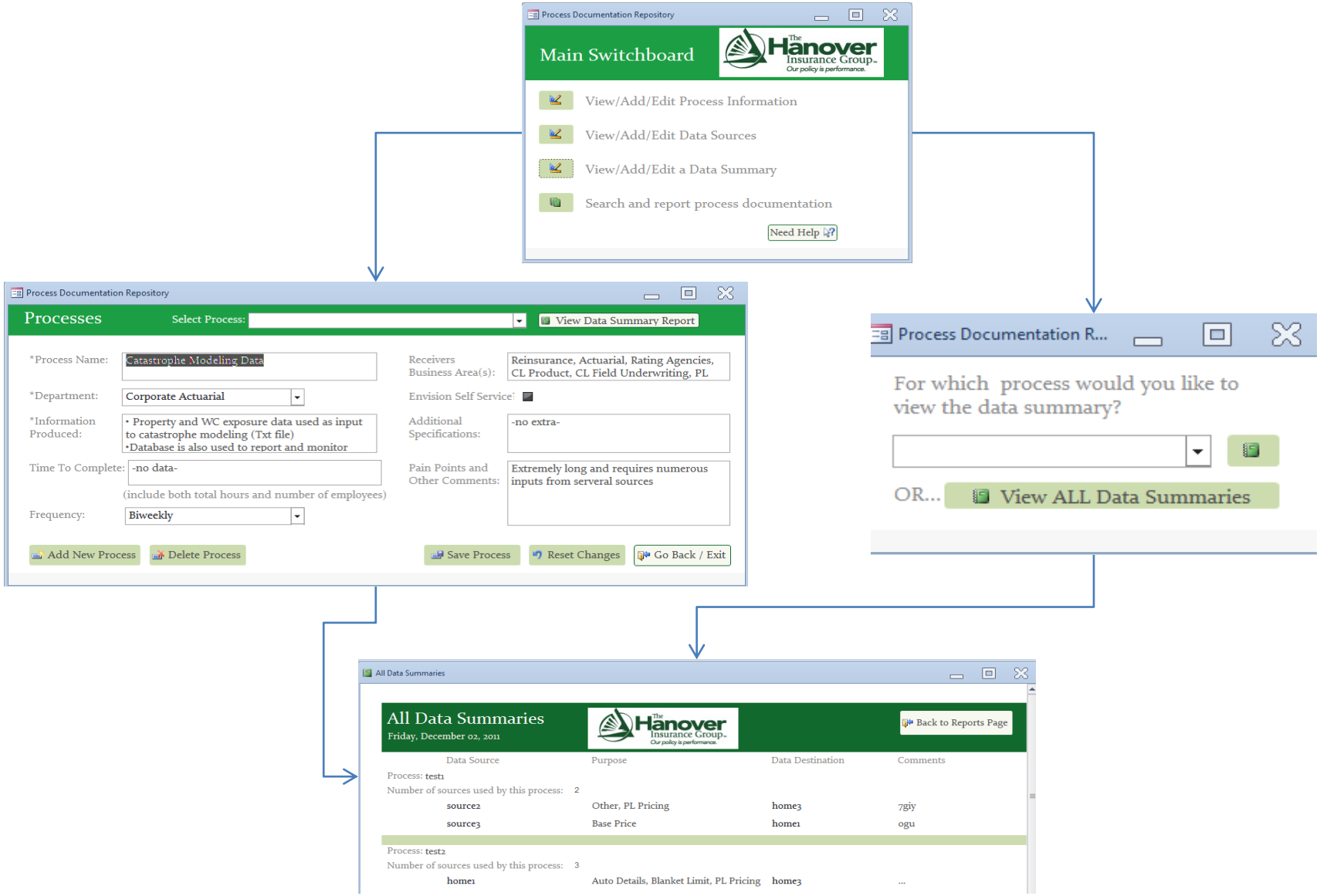

Figure 10 - Process Storyboard

Sources Storyboard

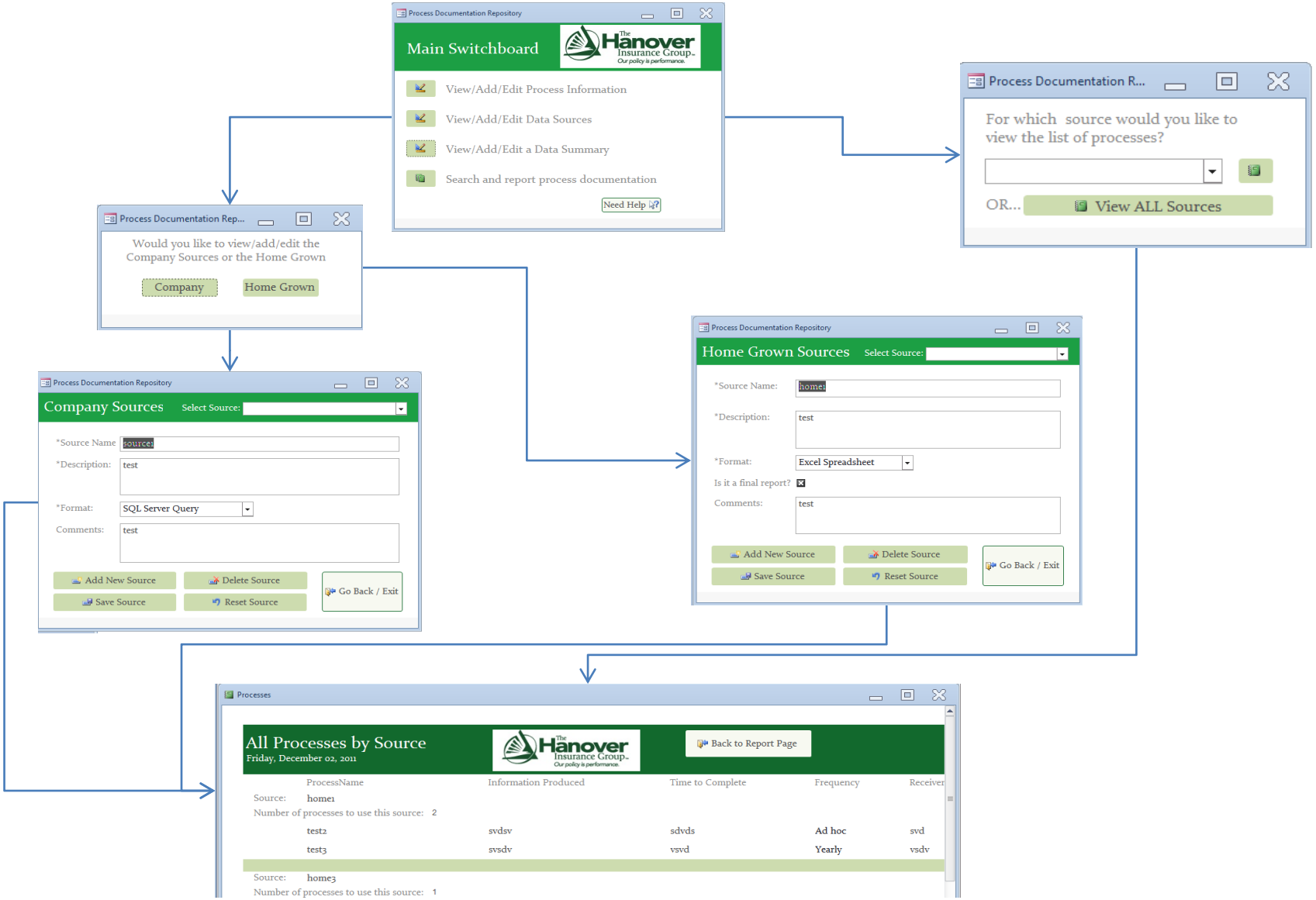

Figure 11 - Sources Storyboard

Data Summary Storyboard

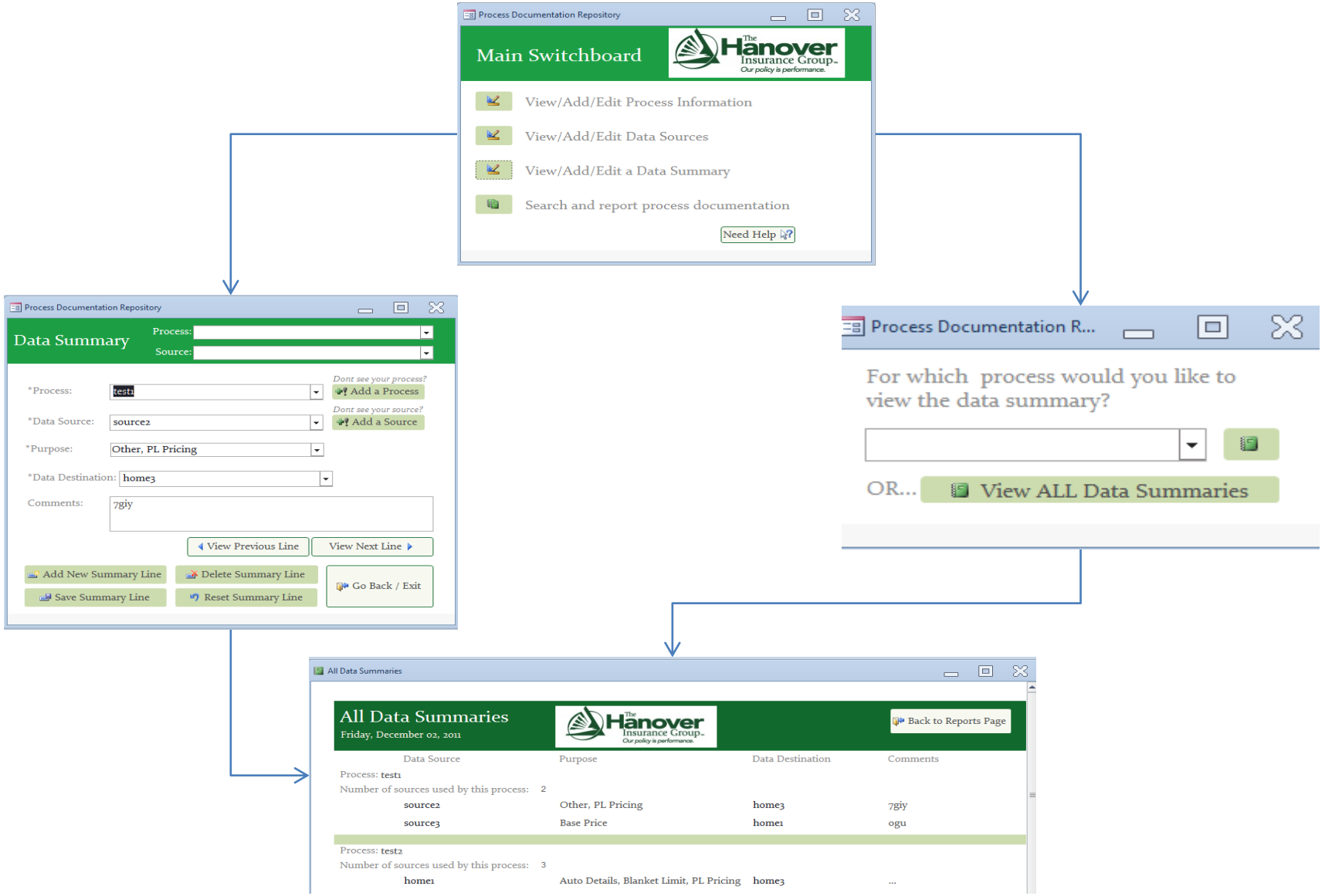

Figure 12 - Data Summary Storyboard

User Interface Structure Diagram

The interface structure design defines the basic components of the interface and how they work together to provide functionality to users. An interface structure diagram (ISD) is used to show how all the screens, forms, and reports used by the system are related and how the user moves from one to another.

The following interface structure diagram, Figure 13, shows how the user can add data sources and processes to create the data summaries that contain more detail information on the interaction of data sources and processes.

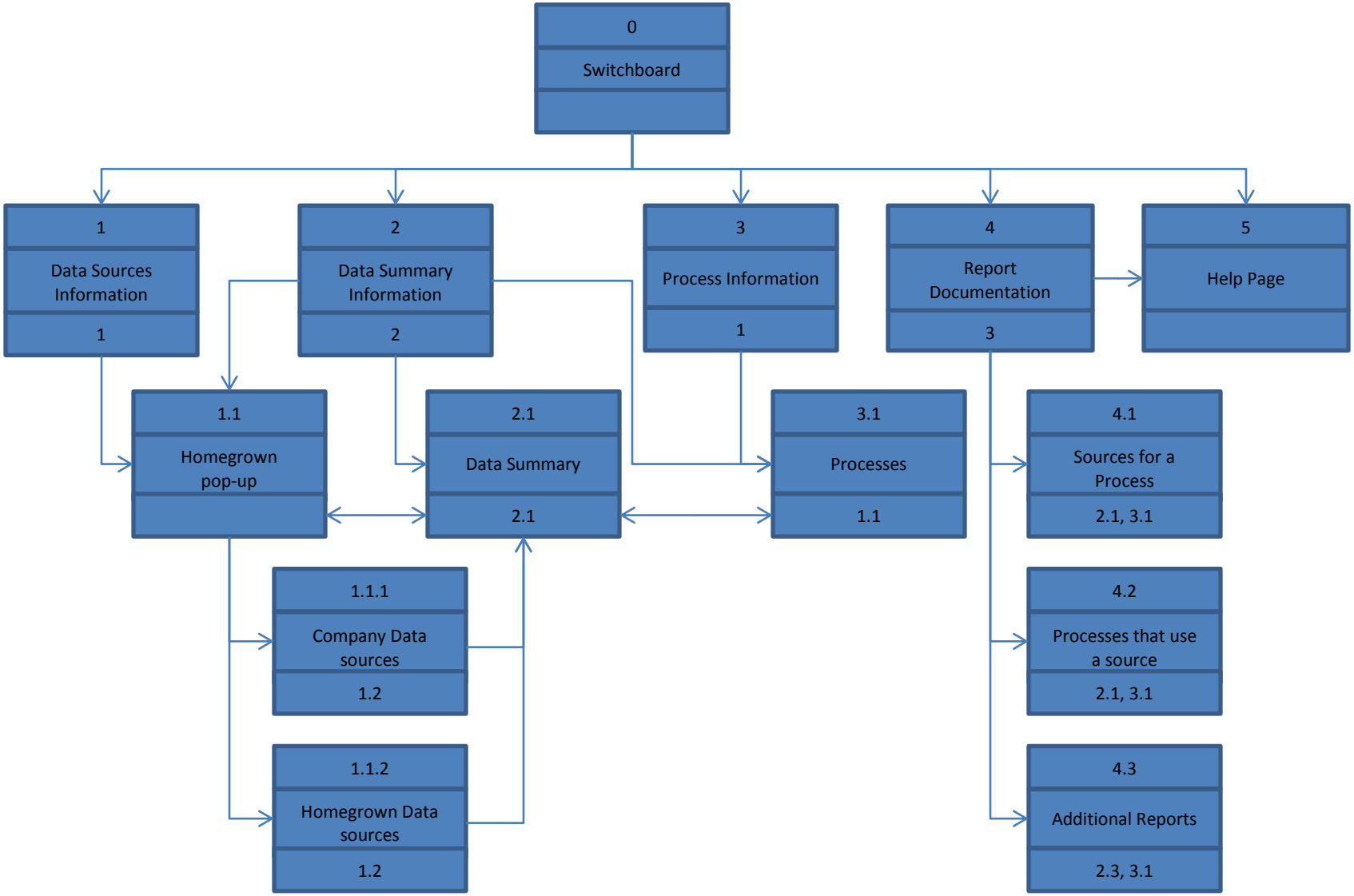

Figure 13 - User Interface Structure Diagram

Prototype Implementation

To facilitate the Business Intelligence initiative at Hanover, our system not only needed to be fully functional but it also needed to be properly handed off to the MIS team at Hanover once our project at Hanover is finalized.

In order to ensure that our project is fully functional, we tested the database to identify technical limitations and correct them. We also provided all the documentation of the SQL code and procedures for entering data in the database and uploading wiki pages on Datapedia. To provide a successful transition we have outlined a migration plan, which facilitates the ownership transition of the system.

Testing

Three different types of tests were executed on the system: Integration & Unit, System, and acceptance tests.

We conducted Integration and Unit tests as one, through a combination of black-box testing and user interface testing. With this combination we tested the functionality of all the different interfaces, while supervising that the processes documentation was well captured in the database.

System tests allowed us to verify the feasibility of maintaining the information in the prototype database in Access, while linking the information with Datapedia. Through meetings with David Doe we learned that policies on documenting procedures and posting them in Datapedia are currently being revised. If we were able to establish the baseline for the interaction of the prototype and Datapedia, it would be very simple to translate those concepts into the actual system in a manner that complies with the policies to come.

Acceptance testing was very limited due to time constraints. Kim Killeen was our main user since we were expecting her to be the one to take ownership and be the main user of the database. Lisa Voellings and Cilsy Harris were users for acceptance testing since they were the sponsors of the project and were heavily involved with the activities related to the business users. A complete listing of the test plans can be found in Appendix G - Test Plans.

To ensure that the information found in the reports created from the database is useful and reliable for the business users, the templates for data source documentation and report documentation found in Sample Process Flow that would be the *result from Prep Form and documentation meetings*

Appendix C - Data Source Documentation Template and Appendix D - Report Documentation were utilized to maintain for format and consistency with the rest of Datapedia. The templates provide specific information regarding a specific process or source.

Both the database report and the data source documentation template for Datapedia contain a description for a specific source, the background of the source and line of business that utilizes the source. Business users are able to find how often the data of a source is updated, a summary of its data elements, the location of the source and a brief description on how to access the source. For the report documentation, the MIS and the business users can find the report name, its producers, and the objective in the database and Datapedia respectively. The frequency at which the report is created and the necessary data sources are both described in the reports of the database and the wiki-pages too.

The main challenge, in terms of systems testing, is maintaining the information displayed in wiki-pages up to date. Since the information displayed in the reports of the database is what is utilized in the template for Datapedia, it is important that the content in the wiki-pages is revised periodically. Once the Access prototype has been migrated to a platform maintained by HTG, the process of updating wiki-pages may be partially or fully automated, which would save the manual labor of extracting the information that is relevant to the business users from the reports utilized by the MIS team.

Documentation & Training

Since we were developing the prototype and then handing it off to the MIS team at Hanover, it was beneficial to provide them with descriptions in the Procedures Manual on how to perform business tasks with the system. We were expecting each item in the Procedures Manual to guide the user through tasks that will require several function or steps that are uniquely to our system. Reference Documents and Tutorials were not included based on the fact that the MIS is knowledgeable of relational databases environments.

The MQP team provided training for Kim Killeen (Director of MIS team), David Doe (Manger of Business Solutions), and Linda Brench (Business Analyst in HTG). As mentioned before, Kim Killeen took ownership of the project, thus it was essential that she is aware of all

capabilities and limitations of our system. David Doe was our person of contact for Datapedia, and training him on how to extract the information from the database to create wiki pages proved useful to keep Datapedia up to date. Linda Brench will be able to understand how the information from the process documentation was encompassed and manipulated throughout the system.

Migration Plan

The migration plan outlines the conversion strategy that was used to successfully hand-off and introduce the system at Hanover. The conversion strategy was mainly focused on the conversion style, conversion location, and the conversion modules, having risk, cost, and time as the deciding factors.

We recommended that the conversion style is direct. Even though the risk is high, the cost is low and the time is short; we relied on technical expertise of the MIS team at Hanover to minimize the risk of introducing this new system. The location should be done through pilots of super users from the business sections when first interacting with the system and inputting data; we wanted to reduce the risk of inconsistencies in the data and minimizing issues that may arise with the interfaces, allocating time for a successful introduction of the system. The module conversion should be whole-system since it will be introduced to Hanover as an innovative system, relying once again in the Hanover MIS team's expertise to mitigate the risk.

Contingency Plan

Unfortunately, we will not be able to collaborate with any system maintenance after the project is finalized. We expect the documentation, training and migration plan to be resources where the MIS team at Hanover can find answers for frequently asked questions or solve possible questions that may arise after our departure. We strongly believe that the MIS team at Hanover has the skillset in-house to be able to solve any problem with the system, either technical or usability, that they may encounter.

Chapter 6: Recommendations & Conclusions

In this final section, we discuss our recommendations for the final system based on our discussion and analysis throughout this report. We also discuss some conclusions that we have drawn from the project experience as a whole.

Recommendations

The following recommendations will provide the MIS team at Hanover with guidelines on the system specifications to implement the actual system based on the prototype the MQP team built, the migration plan to ease the transition from the prototype to the system, and an additional option to facilitate the comparison of the process flows.

System Specification

The software and hardware specifications for a successful implementation of the prototype the MQP team developed are described in this section. This section will complement the non-functional requirements gathered in Chapter 3 by linking the prototype of the Process Documentation Repository to the existing system architecture at Hanover.

Architecture Report

After analyzing the system requirements for the prototype, the MQP team believes that a client-server based architecture is the most practical for the future system since it is broadly utilized at Hanover and it can be easily implemented.

We suggest that the server should host the data storage and the data access logic. We envision the system as a tool that can be used by many users, and having the data stored in a server facilitates that concept. The security of the data can be ensured through permissions to the server for selected users. The data should only be accessed by employees of the MIS team at Hanover. Any other users will be able to see the information pertinent to them on Datapedia. The database should allow multiple users to search for data simultaneously, however only one user should be editing a certain instance of an entity at once.

On the other hand, the client hosts the application and presentation logic. It makes the most sense to have the client computer be the one performing the searches and communicating to the server to extract the relevant data for the user. By hosting the presentation logic in the client

computer we are complementing the application logic, since it should be the client computer the one to display to information on the users monitor.

Hardware and Software Specification

SQL servers are broadly utilized across Hanover. From our conversations with Kim Killeen, it is our understanding that the conversion of our prototype into the actual system should be fairly easy as long as we provide the proper documentation for it. From our conversations with David Doe, inputting the process documentation to Datapedia is feasible right now; technical documentation will be added later on, once the policies on business process documentation start to be enforced.

No other hardware of software is needed to implement the system. Developers at Hanover will only need to follow the documentation and implement the system in their desired environment. Additionally, the client PCs for the MIS team at Hanover will require access to the server. General PCs of the business users will only need access to Hanover's intranet as that is the location of Datapedia. This resource for business users will be invaluable during times of change.

Migration Plan

When migrating from the prototype to the system, we recommend a direct conversion from the prototype to the system since the prototype has been tested by the MQP team and will also be tested by the MIS team at Hanover before it goes live. Not doing a direct conversion would imply that the MIS team at Hanover would utilize portions of the system and the prototype simultaneously; since Hanover is looking for a solution that will allow HTG to analyze current systems with the objective of simplifying reporting while minimizing data redundancy utilizing both the prototype and the future system would be contrary to the BI efforts. The SQL environment should be the same, facilitating the tasks the MIS team at Hanover will have to do to ensure full conversion from the prototype.

The conversion should occur simultaneously on all machines using this system because this will reduce the amount of inconsistencies in the conversion process. Users interacting with the data should have the technical knowledge to interact in any SQL environment regardless of

the application. The database schemas as well as recommended queries are located in the Technical Documentation attached in Appendix F – Technical Documentation for PDR. Due to the fact that we input 24 processes-worth of data into our prototype, the developer will simply have to export the data from our prototype database into the newly developed system once it is ready. Importing and exporting data is an everyday part of general business processes at Hanover, especially in the MIS team. Users that do not have the technical knowledge should only have access to the information posted in Datapedia which will remain the same.

We foresee a smooth transition from the prototype designed by the MQP team to a system maintained by the MIS team at Hanover since the concepts used in Access can be quickly and easily transferred to any new SQL environment. We expect the future system to provide more data storage and reliability while preserving the main structure of the prototype.

Visual Process search engine

One way to facilitate the process flows analysis is by providing graphical user interfaces. Thus, to facilitate a less cognitive demanding comparison of the different data flows we recommend an application framework such as Microsoft Silverlight. For example, Microsoft Silverlight can convert the information in an Excel spreadsheet into graphical interface allowing the user to compare various data flows in a graphical manner through enhanced guided user interfaces, and it refines the information shown to the user based on the user needs. Figure 14 and Figure 15 demonstrate the ease of use of comparing multiple data flows via such an application framework.

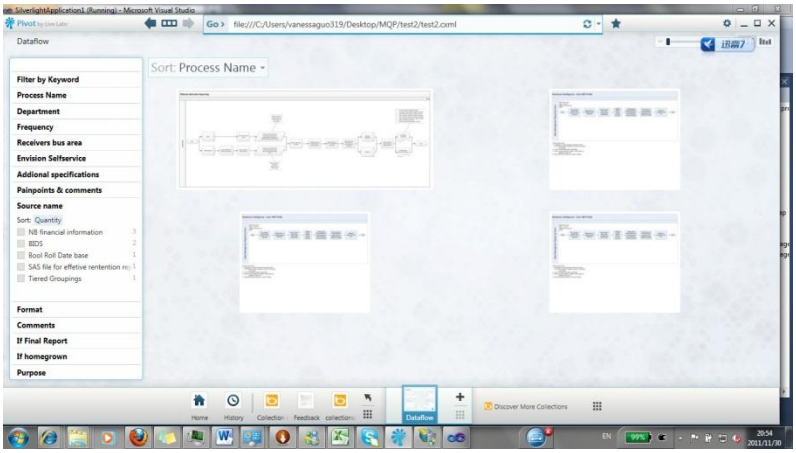

Figure 14 - PivotViewer Screenshot Overview

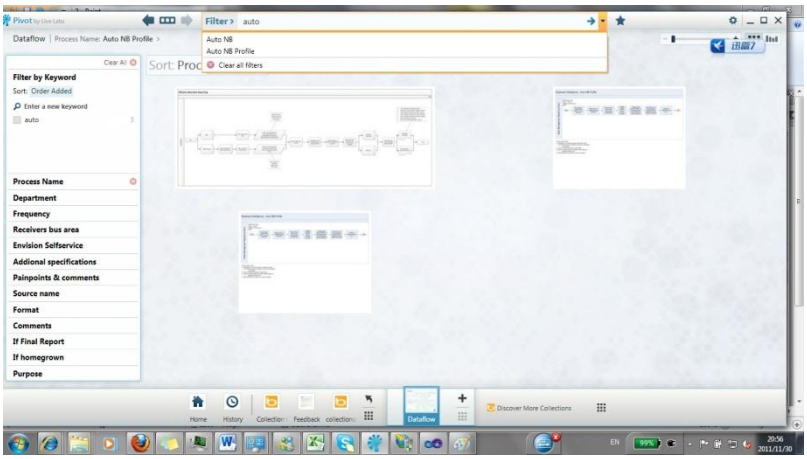

Figure 15 - PivotViewer Screenshot Search Results based on a specific word

Conclusions

Business Intelligence is very important in the corporate world today. The MQP team was given the opportunity to take on a challenging project related to Business Intelligence at the Hanover Insurance Group. In the 21st century, it is a necessity to be able to manage and process the never-ending flow of data and information to remain competitive in any industry.

The MQP team was tasked with assisting the Business Intelligence (BI) team and the MIS team at Hanover in their efforts to identify high impact, value added investments that clearly align and support business priorities, and identify and quantify current business opportunities that have clear efficiency payback, by documenting reporting processes consistently and designing a tool that facilitated searching for data overlap and redundancies. During our initial research for the feasibility analysis, the MQP team learned of many tools used for data storage and analytics and of their core functionalities. Also, through extensive usage of the systems analysis and design guidelines, we have become more familiar with the necessary steps to take when introducing a new system to a company.

Not only did we, as students, learn about the value of information and technology in the business world but we also were able to learn about the corporate culture as well. Through interviews and simple daily interactions, we met many employees from varying departments. Aside from asking them questions regarding our project, we were able to get an insight on what working in the insurance industry represents.

In its entirety, the MQP project experience was a great learning experience. Although stressful at times, it was a chance to gain invaluable experience at a remarkable company, work in-depth applying theoretical concepts into practical applications in a corporate environment, and also expand our network with corporate professionals. Whether we wish to continue our academic career, move on to the corporate world, or possibly both; this project has reinforced everything we have learned at WPI and will definitely contribute to our overall success in the future.

Appendices

Appendix A - Meeting Minutes

MQP Meeting Notes: 9/13/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Review specifications of project
    a. Clarify any confusing/questionable aspects
2. Discuss project scope
    a. Is it possible?
    b. How can we adjust? (if necessary)
    c. Draft sample proposal for Hanover?
3. Outline a rough draft for a project plan/dates
    a. Estimates for possible deadlines/deliverables
    b. Be aware of any dates where we need to adjust meetings with Hanover (i.e. – Career Fair on 9/21)

Minutes:

- Initial meeting with client, received ID badges
- Discussed overall project, received general outline of scope – our basic responsibilities and capabilities
- Cilsy Harris, **Kim Killeen**, Jillian McMillen, Lisa Voellings, Karin Winsky are our main contacts

Deliverables: (for next meeting – 9/20)

- Introduction – problem statement (this will look like an extended system request.)
- Literature review – start by describing the organizational context, including both a broad overview of the company and the specific business processes being affected. Then examine the technological alternatives that might be considered, including a thorough review of the pros and cons of each.

MQP Meeting Notes: 9/20/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Review the introduction, Literature Review and Tool Analysis
    a. Clarify any confusing/questionable aspects
    b. Suggestion for the improvement
2. Discuss about the timeline
    a. The project and MQP Paper sections & scope
    b. Specific time for each section
3. Discuss about the proposal
    a. The date for proposal is Sept 28th
    b. Suggestion for the improvement and presentation

Minutes:

- Second meeting with Lisa Voellings, went over the Enterprise Alignment, Cross-functional Business Intelligence Community and Business Information Strategy.
- Discussed more detail, low level project, went over all the detail documents.
- Discussed about the detail process with Jillian McMillen, gathering the basic requirement and discussing about the allocation in order to come up with timeline.
- Went over the basic structure of PMS terminology, in order to help us understand about the tools and technical processes.

Deliverables: (for next meeting – 9/27)

- Project Proposal: including detail Timeline, Business Requirement, Feasibility Analysis and Proposed Methodology.
- Modify Introduction, Literature Review and Toll Analysis based on more detail requirement and Instructor's comment.

MQP Meeting Notes: 9/27/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. No interviews with any departments at Hanover
    a. Tough to estimate dates for timeline
    b. Also, this means we have not gathered any new system requirements either
    c. Hopefully can get meetings for tomorrow
    d. Will continue to work on prototype of tool which we started on 9/21
2. Currently working on certain sections of MQP paper
    a. Business needs
    b. Business requirements
    c. Business value
    d. Special issues/constraints
3. Draft of proposal
    a. Have members of leadership team review and critique it
    b. Cilsy should be included in this meeting to have input before we present on 10/5
    c. Professor thoughts?

Minutes:

- Got our work stations – including computers, Outlook email accounts, and LAN access
- Spoke with David Doe, gave insight to certain resources we can use throughout the data collection, analysis, and tool building (Datapedia)
- Starting creating the "prototype of the prototype" as a visual brainstorming tool to get started

Deliverables: (for next meeting – 10/4)

- Complete proposal to present on 10/5, including detailed timeline and methodology
- System requirements –from meetings with individuals of various departments at Hanover

MQP Meeting Notes: 10/4/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Will be making our own meetings (copy Lisa and Kim on all invites)
    a. Plan on doing a total of 15 processes
    b. Approx. 3 per week from Oct 5 – Nov 2 (or Nov 9)
    c. Will continue to work on prototype of tool in tandem
2. Review revised proposal
    a. Word document and PowerPoint
    b. Any grammar/content errors or inconsistencies?
    c. Suggestions for improvements?
3. Recommendations for next week?

Minutes:

- Clarified details of what Hanover wants for documentation and tool
    - Feasible amount of documentation ~ 15-18
    - Tool can be whatever we deem fit (must defend choices in proposal)
- Reviewed inventory of all processes that have been scored
    - Only 9 have been fully documented
    - Also must check for consistency among these already documented processes
- Continued to develop "prototype of the prototype"
    - Inputting the data we have in order to better understand relationships amongst data points

Deliverables: (for next meeting – 10/11)

- Rough draft for 'Planning' and 'Analysis' phases of systems analysis and design for MQP paper?
- System requirements –from meetings with individuals of various departments at Hanover
- Sample of meeting notes, flowcharts, etc.

MQP Meeting Notes: 10/11/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Discuss about the proposal presentation
    a. Suggestions for final presentation
    b. Suggestions for next step
2. Discuss the MQP report
    a. If we should include feasibility for cost.
    b. Suggestions for improvement
3. Discuss about the schedule during break
    a. Which day we are going to the company
    b. Deliverables for the break
4. Update about the first meeting with BI team last week.

Minutes:

- Had the proposal presentation to project sponsors.
    - They were all agreed on the proposal.
    - Get proposal agreement signed off by key project sponsors
- Had meeting with Robert LaChance, discussing the Hi Yield Reports process.
    - Went through the process and pinpoints for the project.
    - Sent the preparation form to Robert.
- Discussed about integration of SharePoint site and existing Datapedia site with David Doe
    - Discussed the suggestion regarding the proposal.
    - Got suggestions about the integrations of SharePoint site and existing Datapedia
    - Get user information methodology for IMart tool.

Deliverables: (for next meeting – 10/24)

- MQP Report: continues write up MQP Report.
- Modify Introduction, Literature Review, Tool Analysis and planning parts.

MQP Meeting Notes: 10/24/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Review actions taken over the break
    a. Two days spent at Hanover
    b. Extensive work on academic portion of project
2. Discuss timing of project and progress thus far
    a. What portions should be done now?
    b. In the very near future?
3. Possibly bring in sample of paper in for next time?
    a. How much to have done?
    b. Will it affect end grade?

Minutes:

- Have met with 3 of 7 employee contacts so far
    - Completed approx. 7-9 process flows and documentation
    - Have 3 more meetings next week, and two the week after
- Received feedback on initial ER-diagram design for database
    - Made appropriate edits and starting to put into Access
    - Acquired detailed business area breakdown from Linda Brench
- Worked extensively on MQP paper over the break, have completed or nearly completed the following portions
    - Literature Review
    - Methodology
    - Analysis and Design

Deliverables: (for next meeting – 10/31/11)

- Continuing work on the MQP paper, possibly review some work for next time
- Extended system requirements –from meetings with individuals of various departments at Hanover
- Additional samples of meeting notes, flowcharts, etc.

MQP Meeting Notes: 10/31/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Review the MQP Report
    a. Four chapters in total including introduction, literature review, methodology and Analysis and Design
    b. Will implement as gathering more requirements.
2. Possibly bring in the first draft of the database?
3. Update about our schedule
    a. Schedule about the meetings with employees
    b. Schedule about the database
    c. Schedule about the SharePoint site

Minutes:

- Have met with one more employee contacts last week
    - Had the interview and went through two more processes
- Received feedback on initial ER-diagram design for database
    - Made appropriate edits and starting to put into Access
    - Acquired detailed business area breakdown from Linda Brench
- Worked extensively on MQP paper, have completed the first draft of chapter one to four.
    - Literature Review
    - Methodology
    - Analysis and Design
- Continue the meeting with Hanover Employments
    - Have two meeting this week and two more meeting the week after
    - Have the meeting with David Doe to discuss the feasibility of the integration of Datapedia
    - The deadline for interview is in two weeks.

Deliverables: (for next meeting – 11/07/11)

- Continuing work on the MQP paper
- Sample of the data flow and diagrams
- The ERD and same sample database

MQP Meeting Notes: 11/7/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Update on scheduled interviews
    - Have approximately 12 processes done
    - This week is our proposed deadline for completion of process documentation
2. Feedback on second draft ERD
    - Awaiting Kim's reply
    - Can begin development soon after feedback
3. Update on Datapedia
    - Technical Documentation, etc.
4. Next steps once documentation is completed
    a. Focus heavily on tool development

Minutes:

- Have met with 5 of 7 employee contacts so far
    - Completed approximately 12 process flows and documentation
    - Have 2 more meetings next week, and it's our last week for interview.
- Met with David Doe to discuss how to implement our project within the Datapedia environment
- Continue work on the MQP paper

Deliverables: (for next meeting – 11/14/11)

- MQP paper with more details
- All the documents for interviews
- Prototype for the database

MQP Meeting Notes: 11/14/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Review Chapter one
    a. Completed chapter one and two are fully done.
    b. Chapter three and four have been edited but need to be revised for proper referencing.
    c. Currently working on chapter 5.
2. 3rd version ERD.
    a. Hopefully this will be the final one.
3. Update about our schedule
    a. One more meeting needs to be scheduled.
    b. Finalize ERD this upcoming Wednesday

Minutes:

- Received feedback on second ER-diagram design for database
- Finishing references for Chapter 1-4.
- We asked for the letter from the sponsor
- Start inputting data into Datapedia

Deliverables: (for next meeting – 11/21/11)

- Revised sections of MQP paper
- The ERD and first prototype of database

MQP Meeting Notes: 11/21/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

1. Quick demo of prototype so far
    a. How to do training?
    b. Proper documentation okay?
2. Review edited portions of paper
    a. Is HTG section okay? How to source?
    b. Key changes to structure of the report
        i. Moved system specification to Ch6
        ii. Included storyboards and interface structure in Ch5
3. Chapters 1, 2, and 3 are complete
    a. Ch4 is being worked on
    b. Ch5 is being worked on
    c. Ch6 will be written later (conclusions)
4. Update about our schedule
    a. When to show first draft by?
    b. Okay without Ch6 to show?

Minutes:

- Finalized ERD
- Began development of interfaces
    - Reports and queries still pending
- Acquired the Letter from Project Sponsor
- Start inputting data into Datapedia and into the database
- Started to write testing and documentation

Deliverables: (for next meeting – 11/28/11)

- All chapters (except Ch6) written, but not revised, for MQP paper
- Prototype of the database with working macros, forms, reports, etc.
- Samples of Datapedia pages (if acquire template from David Doe)

MQP Meeting Notes: 11/28/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

4. Demo of prototype with test data (not actual data)
    a. Questions or comments?
    b. Will be putting in actual data Wednesday
    c. Also changing design to fit Hanover theme
5. Review edited portions of paper
    a. Advice on locations of appendices
        i. User and technical manual
        ii. Meeting minutes
        iii. Process documentation forms
        iv. Process flows
        v. Etc.
    b. Key changes in overall report
        i. Chapters 1, 2, 3, 4, and 5 are done
        ii. Need to peer review and revise some portions still
6. Update about our schedule
    a. Will drop off first draft on Thursday, December 5th
    b. Set to contain Chapters 1-5 complete, all appendices in correct order

Minutes:

- Did not work at Hanover this past week
- Worked individually on various pieces of the MQP report and prototype
- Plan to finalize prototype theme details and other loose ends at Hanover this Wednesday

Deliverables: (for next meeting – 12/5/11)

- All chapters (except Chapter 6) written and revised with appendices, table of contents, etc.
- Prototype of the database with Hanover theme and data input

MQP Meeting Notes: 12/05/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

7. Review MQP paper
    a. Adjust the MQP paper according to Professor Djamasbi' s comment.
8. Update about the schedule and final presentation
9. Discuss any suggestion for final presentation.

Minutes:

- Worked on the MQP paper for the first review
- Got Datapedia preparation from David Doe
- Edited the MQP paper according to Professor's comment
- Worked on the implement of pivot viewer.

Deliverables: (for next meeting – 11/12/11)

- The complete MQP paper with citation page, chapter 6 and changes after the first review.
- The complete system demo which is ready to present for the final presentation.
- The PPT for the final presentation
- The poster for MQP

MQP Meeting Notes: 12/12/2011

Attendees: Sean Burke, Wenxuan Guo, Luis Quiroga, Professor Djamasbi

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Agenda

- Practice the presentation
    - Any comment or suggestion
- Any suggestion before the final presentation
- Already put all required documentation, repository and appendixes in the drop box.
- eCDR form

Minutes:

- Worked on the MQP paper according to Professor Djamasbi's comment
- Got signature from Kim and Lisa for letter of acknowledgement
- Continues worked on the repository and Datapedia for final presentation
- Prepared the PowerPoint and poster for the final presentation

Deliverables:

- MQP paper and related material on Dropbox.
- Final PowerPoint
- Final Poster

Appendix B – Business Process Flow Preparation Form

Business Intelligence Working Group – Business Process Sessions
Pre-Session Preparation

Business Process Name:

What's produced/output:

-
-

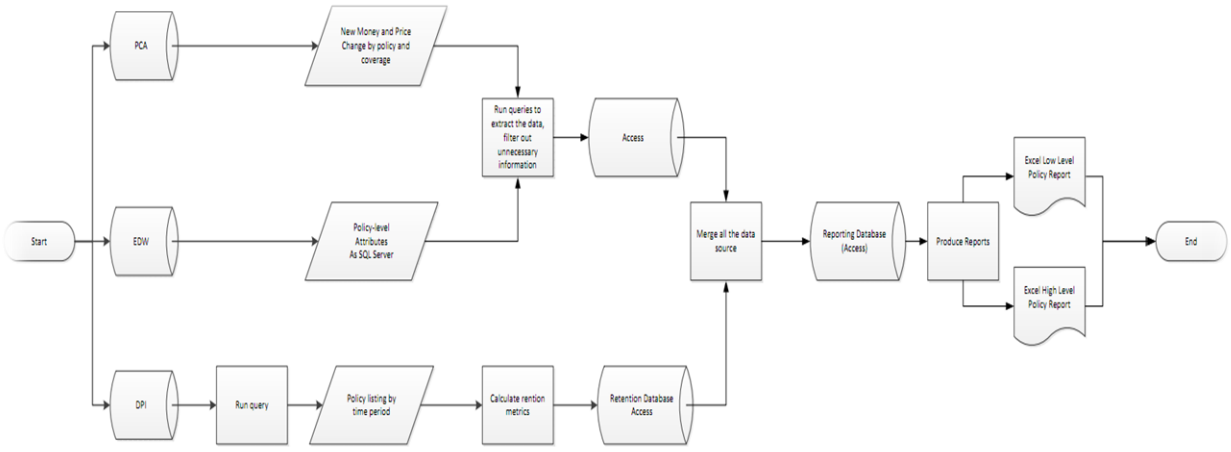
Consumers (number and area(s)):

-
-

Envision self-service? (Y/N):
Players/actors:

Data Sources / Elements:

Data Source	"Home-Grown"? (Y/N)	Data Element(s)



Sample Process Flow that would be the result from Prep Form and documentation meetings

Appendix C - Data Source Documentation Template

Data Source Documentation Template

Description/Purpose
Basic description of the source, its content and business value, and why it was created.

Background Information
(Optional) Information that helps the user apply this source appropriately, including LOB and other context-informing descriptions.

Lines of Business
List of CL and PL Drive Lines of Business included in the source.

Source Update Frequency
How frequently the source is updated with new or revised data.

Experience Type
Accident, Calendar, Inforce, Issued, Policy, Reported, etc.

History Available
The number of periods maintained in the source.

Version Control
Whether or not the source is versioned, with links to explanation of this term.

Originating Source
Cite the original data source from which this source is populated, e.g., POS, PMS, etc.

Subsidiaries/Platforms Included
List of which subsidiaries and processing platforms are included, given that most sources do not include all data.

Data Model
Links to available data models.

Data Elements Summary
Describe the types of data included (aka subject areas) and links to a data element list or to MetaCenter (where user can get many things).

Granularity
Check box listing (ideally) from a handful of categories about how granular the data is in this source.

Common Uses
Description of how the source is used in reporting or applications.

Source Location
List the technical location of the source: Platform, database, and instance.

How To Access The Source

List of the available means to access the source. Descriptions should be provided in separate files to which the site links.

Related/Supplemental Sources

Brief explanation of when this source relates to others tangibly.

System Stewards

Business owner(s) and caretakers, people who rely upon this source and have responsibility for maintaining its integrity.

FAQ's

TBD - Link to a discussion board for this source.

Appendix D - Report Documentation

Report Documentation

Required Documentation

Report Name
The report title should in some way describe the basic objective of the report or its content.

Report Producer(s)
List the functional area(s) responsible for producing the report. Contact information should be provided.

Report Ownership
List the department and position(s) responsible for the content of this report. Names are optional.

Objective / Description
Describe why the report was created and provide a basic description of its content. (Optional) Explain any significant report breaks.

Background Information
Describe non-intuitive information about the report, integration efforts made to create the report, and other helpful information.

Conditions & Caveats
Describe all qualifications of the report content:

- Exclusions: Explain any type of data excluded, e.g., involuntary, catastrophes, etc.
- Report Qualifier: Direct/Assumed/Ceded/Net
- Report Basis: (Optional) GAAP/Statutory
- Subsidiaries/Platforms: List of which subsidiaries and processing platforms are included.
- Line of Business and how it is defined

Report Frequency
How frequently the report is produced with new or revised data.

Experience Type
Accident, Calendar, Inforce, Issued, Policy, Reported, etc. If there are multiple experience types, explain how they are presented, e.g., by section, rows, columns, etc.

Reporting Period(s)
List the period represented on the report, number of periods, evaluation dates of each period, and how these items interact with each other.

Data Source(s)
Cite all data sources from which the report is produced, e.g., IMart, PCA, etc. Include user-defined transformations if source data is not listed, e.g., "used Group Code to derive Specialty Program Code". Be sure to attribute any copyrighted material used to produce or listed in the report.

Distribution Information

Describe to whom the report is accessible in general terms, e.g., role, location, dept., name. List any security restrictions required and how to gain access to it, including contact information/links. Describe the process used to deliver the report to the user (steps users take to receive it) and/or the format in which it is presented (PDF, Excel, Business Objects, Hyperion, etc.).

Optional Documentation

Sample Report/Screen Shots
(Optional) Provide a separate page to display or link to a sample report.

Control Sources
(Optional) Information regarding how the report was balanced or system to which it is tied.

Data Elements Summary
(Optional) Provide a separate page to list the Business Names and Business Definitions of data listed in the report (or link to Data Dictionary).

User Guide and/or Training Material
(Optional) Provide a separate page or link to material describing how to produce or interpret this report.

Related Reports
(Optional) Brief explanation of similar or related reports. (Provide hyperlinks to each.)

Attributions
(Optional)

FAQ's
(Optional) Link to a discussion board for this source (if available)

Appendix E - User Manual

Hanover Insurance Group
Process Documentation Repository
Prototype User Manual

By Sean Burke, Luis Quiroga, Wenxuan Guo

Introduction

Welcome to the Process Documentation Repository Prototype User Manual. This manual is meant for users who wish to update process, source, and summary information; and also for the users who wish to search and/or report that information in a variety of ways. For the users who wish to edit the database schema or the underlying programming, there is also an attached technical manual for reference.

Key Terms

Process – There are a total of approximately 75 business processes that need to be documented by Hanover during the Business Intelligence Initiative. A 'process' refers to a business process that is normally identified by the content of its output.

Sources – There are two types of sources identified in this manual: Company and Home Grown. A company source is one that is managed by the MIS team or HTG at Hanover. Whereas a Home Grown source is one that lives on a single user's (or small group of users') machine(s) that is managed by the user(s) and not Hanover. It is also worth noting that a home grown source can end up as a final report, since it will only live on a small group of computers and is not managed by the company.

Data Summary – This is the information that relates to a process-data source pair. For example, the purpose of pulling certain information from a database to produce a specific report is something that belongs to a pair and not a single process or source alone.

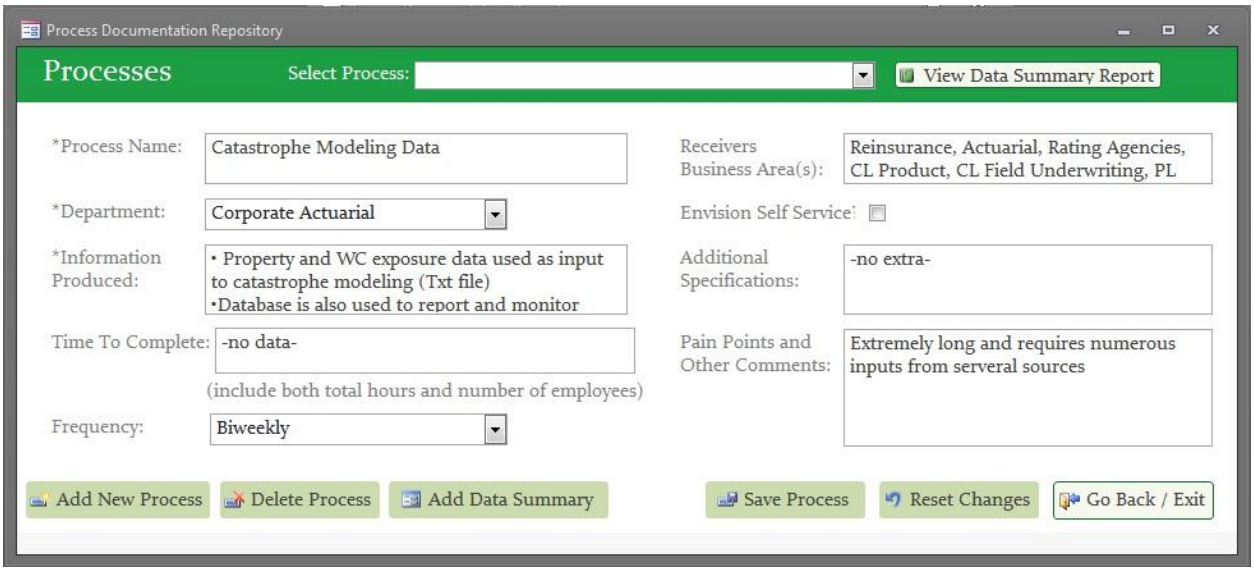
Main Switchboard

This is the first screen that you will see when opening the Process Documentation Repository. There are four core options to choose from on this first page. Each button has text immediately to the right that explains clearly its action. These core options are:

1. Adding and editing process-related information: This can include its name, department it belongs to, frequency, etc. We will get into more depth later in the manual.
2. Adding and editing data source information: This can refer to either Company Sources or Home Grown Sources. Another form will confirm the selection of the type of process after you initially click the button. The information includes the high-level description of the data source, what format it is in, and any other pertinent comments relevant to each data source.
3. Adding and editing data summary lines: This refers to the attributes of the documentation that do not belong to simply a process or a source, but a pair of them. The information includes the purpose to why certain data is pulled from a data source for a certain process, where the destination of the data is, and any other pertinent comments relevant to the data summary line.
4. Searching and reporting: Click this button, and you will be directed to a second navigation page in which you will be presented with various options to search, filter, and report the various information in the tool as a whole.

One last button on the form is to launch the help page. If you click this button, a 'Help Page' will pop up. This 'Help Page' is essentially an abridged version of this user manual for use within the tool.

Processes Form



This form is used to view, add, and/or edit process information. To navigate this form, there is a drop-down menu that contains all processes organized by department. Once navigated to the desired process, you can then view or edit the information for that process. This form almost mirrors the process documentation form used in the Business Intelligence meetings. If you want to add a new process, click the 'Add New Process' button. The table below describes how to fill out this form regardless of if you are adding or editing process information.

Data Entry Label	Description (what should be entered)
Process Name	Name of the process, usually identified by the contents of the output.
Department	Department to which the process belongs to. It is a drop-down list because all processes must fall under a department.
Information Produced	Outlines the output of the process or report. This is the details of the output such as number of files, type of files, etc.
Time to Complete	Includes the hours to be completed and the number of people who work on it.
Frequency	How often the process is executed, it part of a finite drop down list since all processes will fall under those categories.
Receivers Business Area(s)	The area of business in which the users of the output work. Many

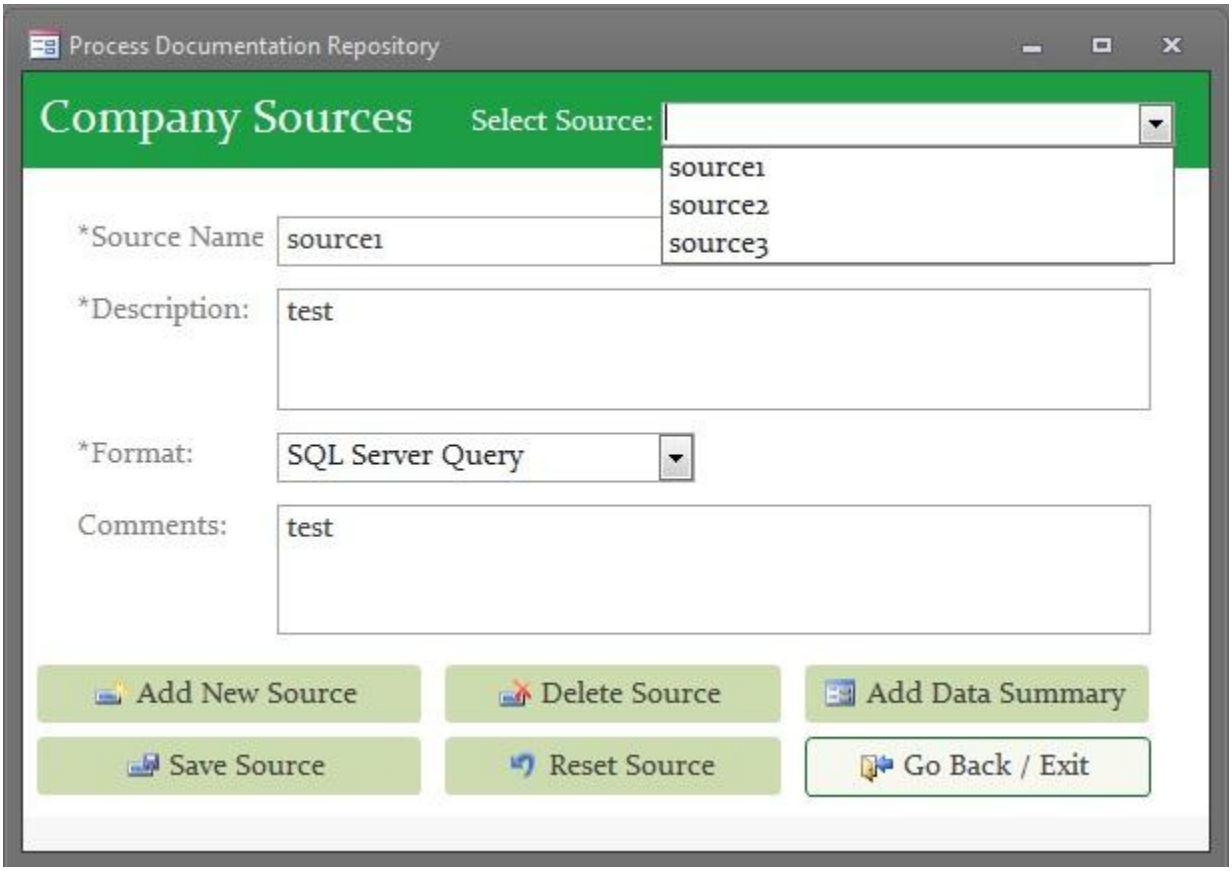
	people/business areas could potentially view the output.
Envision Self Service?	Checked 'yes' if the user believes the process can be helped using Business Intelligence Initiative.
Additional Specifications	Any pertinent additional information not covered in the previous fields.
Pain Points and Other Comments	Addresses the key pain points of the process and comments on them.

Once you have entered or changed any of the information in the form, you can click the 'Save Process' button in order to save your progress. Be sure all fields marked with an '*' is filled in, as it is required. If you made some changes, but want to undo them, simply click the 'Reset Changes' button. This button will undo any changes to the current process on the form. If you would like to remove a process (for whatever reason), then click the 'Delete Process' button. If you accidentally click this button, there will still be a prompt to be sure that is the action you would like to take. Each process has an associated data summary, and this data summary can be accessed using the button to the right of the drop-down menu at the top of the form. If no data summary exists for this process yet, you can navigate to the form to add one using the associated button. Once clicking this button, you should select the process in which you want to full the complete data summary. To return to the main switchboard, click 'Go Back / Exit'.

Choose Source Type

This is a very simple form and is largely self-explanatory. After clicking the button to get to this page, click the 'Company' button to view the company sources and the 'Home Grown' button to view the home grown sources.

Company Sources Form



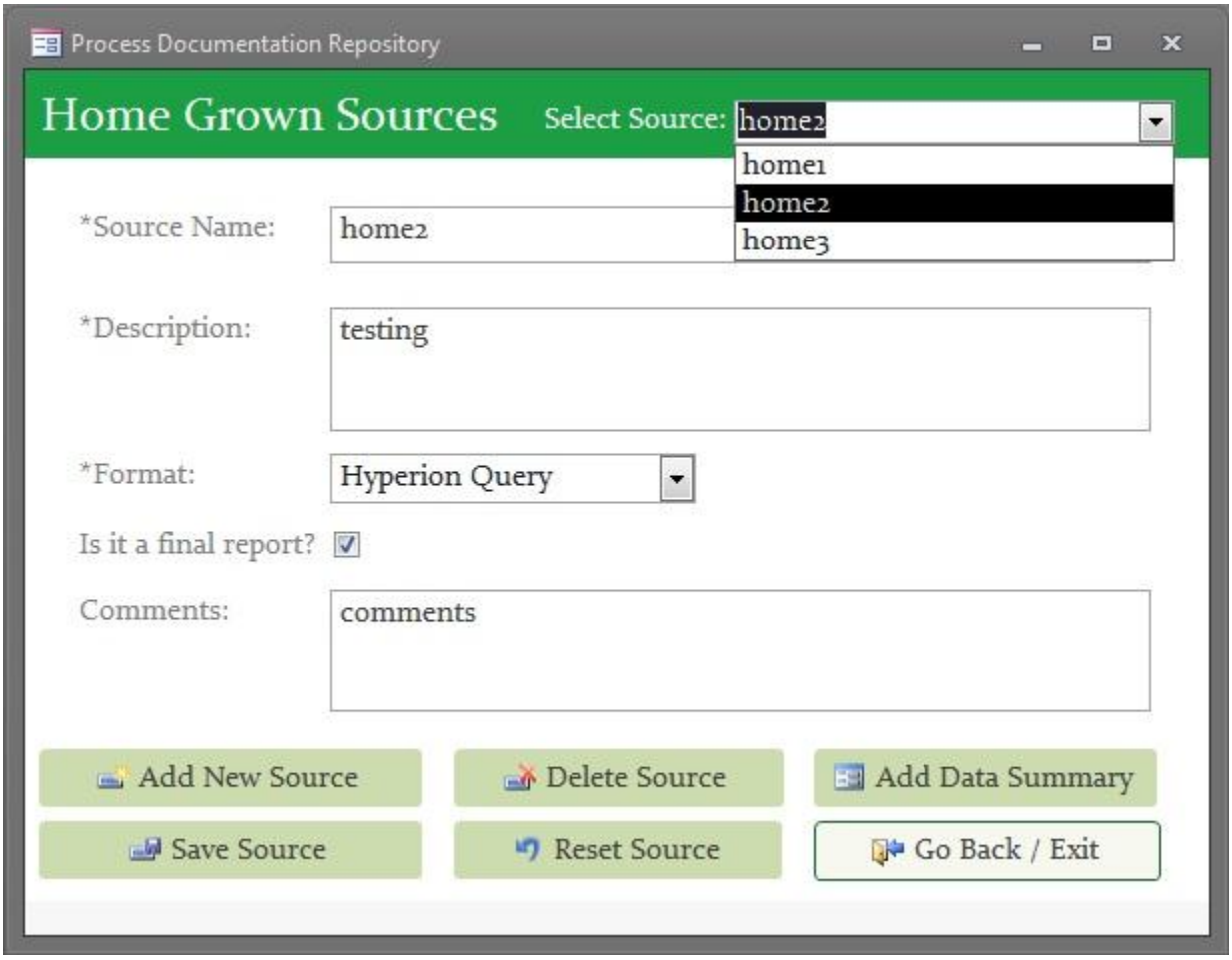
This form is used to view, add, and/or edit company source information. To navigate this form, there is a drop-down menu that contains all sources sorted alphabetically. Once navigated to the desired source, you can then view or edit the information for that source. This form is a high-level overview of what can be found on the source's Datapedia page. If you want to add a new source to the repository, click the 'Add New Source' button. The table below describes how to fill out this form regardless of if you are adding or editing process information.

Data Entry Label	Description (what should be entered)
Source Name	The name of the data source.
Description	High-level description that encompasses what is contained in the data source. For example: premiums, quote-level information, etc.
Format	Identifies the type of source, i.e. – Hyperion, Oracle DB, etc. It is on a finite drop-down list because all sources are one of the listed types.
Comments	Any other pertinent information not mentioned in the previous

	fields related specifically to the source.

Once you have entered or changed any of the information in the form, you can click the 'Save Source' button in order to save your progress. Be sure all fields marked with an '*' is filled in, as it is required. If you made some changes, but want to undo them, simply click the 'Reset Changes' button. This button will undo any changes to the current source on the form. If you would like to remove a source (for whatever reason), then click the 'Delete Source' button. If you accidentally click this button, there will still be a prompt to be sure that is the action you would like to take. To return to the main switchboard, click 'Go Back / Exit'.

Home Grown Sources Form



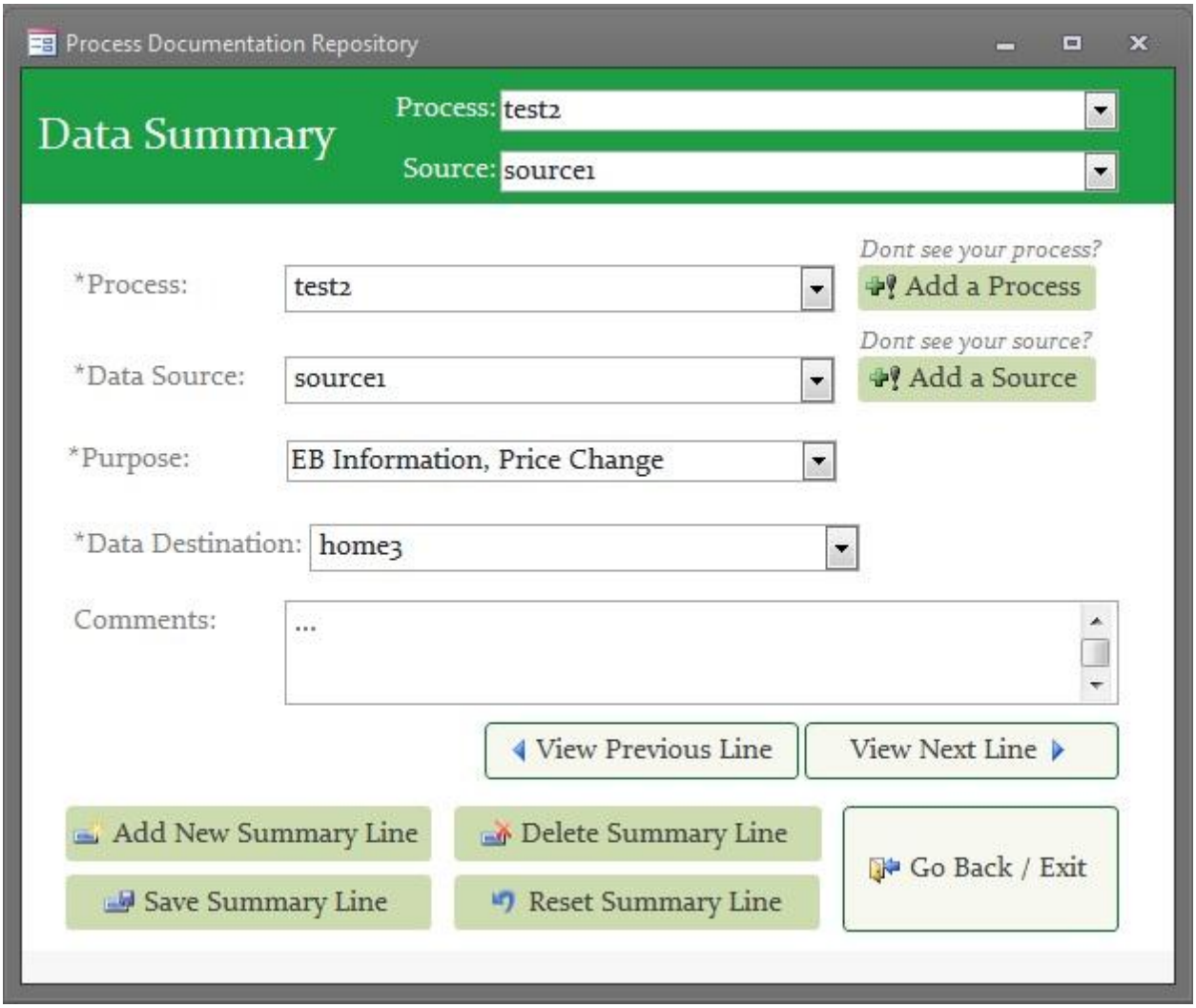
This form is used to view, add, and/or edit home grown source information. To navigate this form, there is a drop-down menu that contains all sources sorted alphabetically. Once navigated to the

desired source, you can then view or edit the information for that source. This form is a high-level overview of what information was given during Business Intelligence meetings with the owner of that particular source. If you want to add a new source to the repository, click the 'Add New Source' button. The table below describes how to fill out this form regardless of if you are adding or editing process information.

Data Entry Label	Description (what should be entered)
Source Name	The name of the data source.
Description	High-level description that encompasses what is contained in the data source. For example: premiums, quote-level information, etc.
Format	Identifies the type of source, i.e. – Access DB, Excel Spreadsheet, etc. It is on a finite drop-down list because all sources are one of the listed types.
Is it a final report?	As mentioned in the Key Terms section, this is needed to identify if the 'source' is the final report for any given process.
Comments	Any other pertinent information not mentioned in the previous fields related specifically to the source.

Once you have entered or changed any of the information in the form, you can click the 'Save Source' button in order to save your progress. Be sure all fields marked with an '*' is filled in, as it is required. If you made some changes, but want to undo them, simply click the 'Reset Changes' button. This button will undo any changes to the current source on the form. If you would like to remove a source (for whatever reason), then click the 'Delete Source' button. If you accidentally click this button, there will still be a prompt to be sure that is the action you would like to take. To return to the main switchboard, click 'Go Back / Exit'.

Data Summary Form



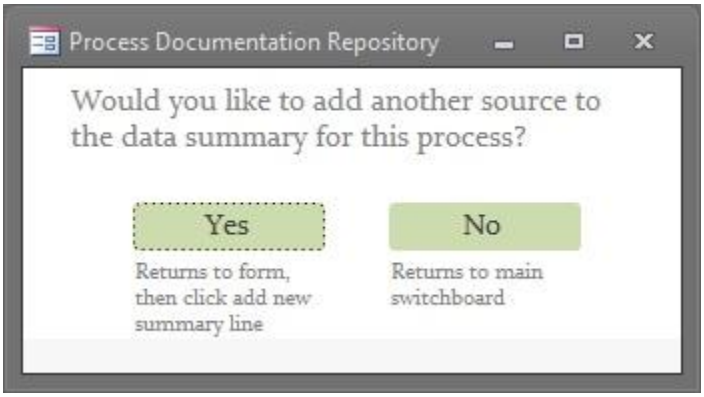
This form is used to view, add, and/or edit the data summary line information. To navigate this form, there is a drop-down menu that contains all processes sorted alphabetically. Once navigated to the desired process, the drop down menu below it is populated with the sources used. This allows you to further navigate through the summary. You can either use this second drop down menu, or you can use the 'Next' and 'Previous' buttons to go through the different lines for each process.

This form is a detailed description of what is documented in the process flow diagrams. The process flow diagrams were created through interviews with the individuals who execute these processes. If you want to add a new summary line to the repository, click the 'Add New Summary Line'

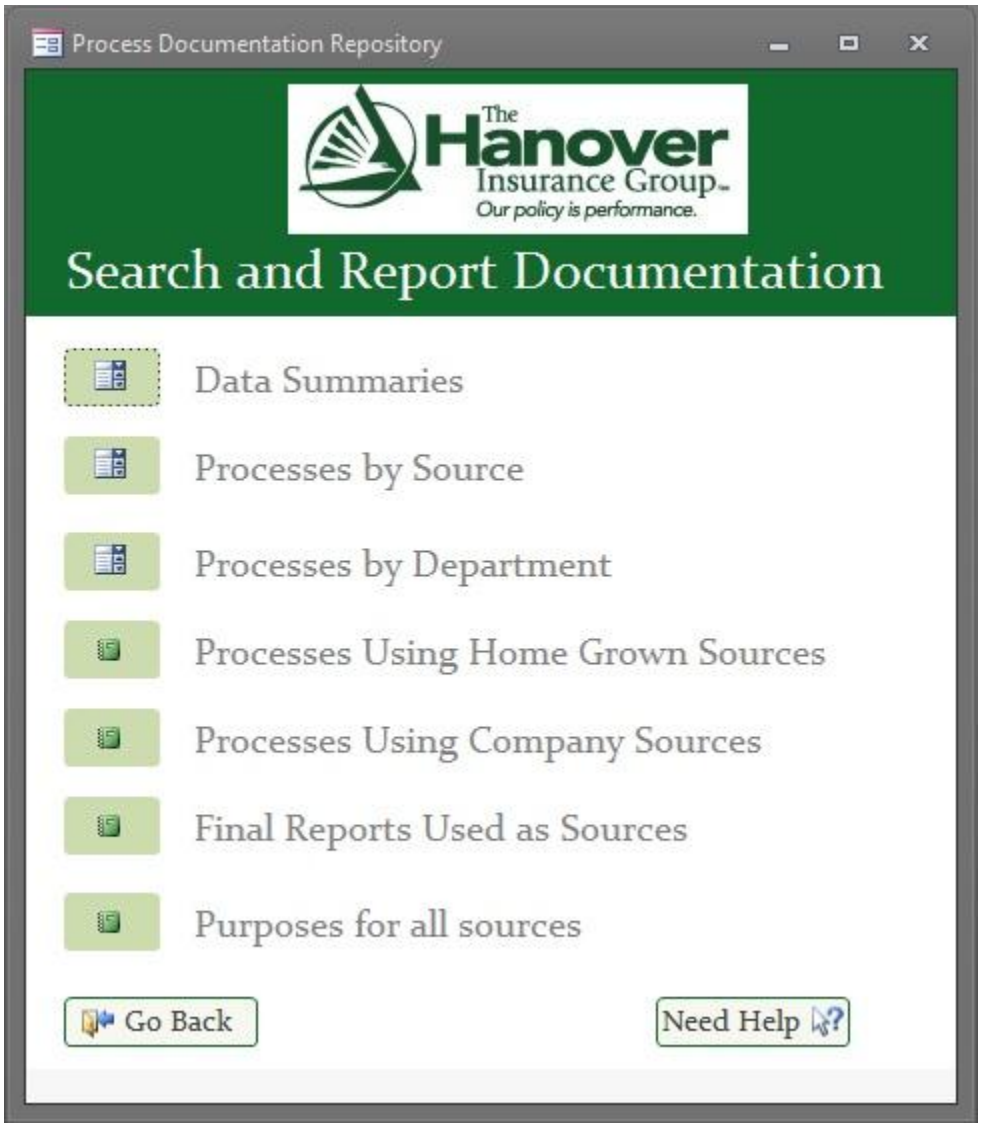
button. The table below describes how to fill out this form regardless of if you are adding or editing process information.

Data Entry Label	Description (what should be entered)
Process	The name of the process using a data source, part of the composite primary key (a drop down list from the values in process name from processes)
Data Source	The name of the data source used by the process in the field above, the second part of the composite primary key (a drop down list from the values of source name and home grown name from company and home grown sources
Purpose	Explains at a high-level what information is pulled or extracted from each process / data source combination – Formatted as a multi-valued attribute for data integrity
Data Destination	After any queries, data dumps, etc. are run… this is where the data flows into (a drop down list from the values of home grown name from home grown sources)
Comments	Any other pertinent information not mentioned in the previous fields

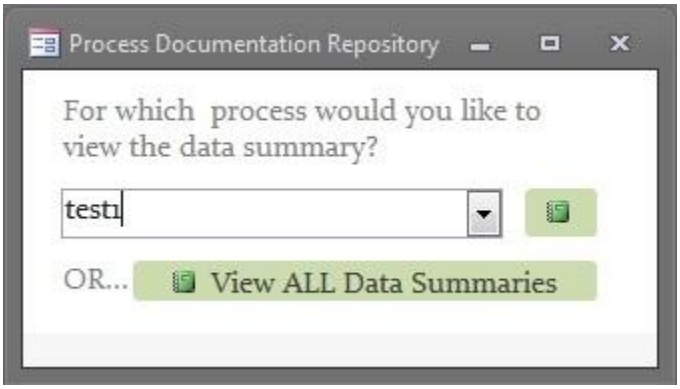
Once you have entered or changed any of the information in the form, you can click the 'Save Summary Line' button in order to save your progress. This will prompt you with a pop-up box that will ask if you would like to add another line for the current process. If you click 'yes', then you will be directed back to the form. If you click 'no', then you will return to the main switchboard. Be sure all fields marked with an '*' are filled in, as they are required. If you made some changes, but want to undo them, simply click the 'Reset Changes' button. This button will undo any changes to the form. If you would like to remove a summary line (for whatever reason), then click the 'Delete Summary Line' button. If you accidentally click this button, there will still be a prompt to be sure that is the action you would like to take. To return to the main switchboard, click 'Go Back / Exit'.



Search and Report Documentation



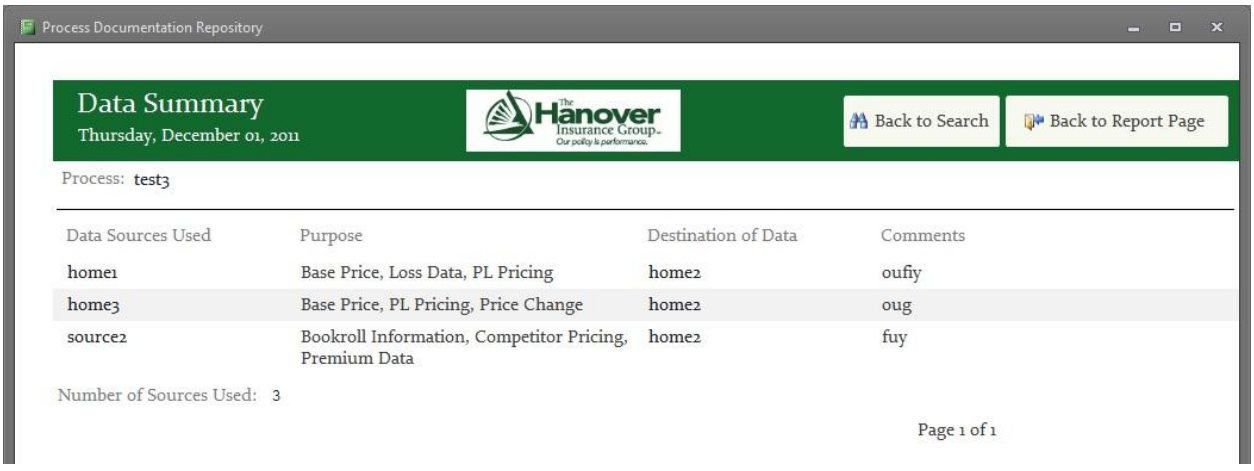
On this form, the user has the ability to select from various searching and reporting methods. As you may notice, there are two different types of buttons. The first set, with the clipboards on them, will produce a pop-up form that requires the user to specify a variable before producing the full report. An example of this pop-up is shown to the right. You can either choose to select a variable to limit the report, or you can just click the 'View All' option to produce a non-limited set of results.



The second set of buttons, with the MS Access Reports on them, will produce a report with no further information necessary to be input. Each button on the page correlates directly to the label text to its right. The reports produced by these buttons will have dynamic filtering within the forms themselves. This will be discussed later in the manual. Since this is again a navigation page and you may need more clarification on the form information, we included another button to link to a 'Help Page' on the bottom-right. And lastly, to go back to the main switchboard, simply click 'Go Back'.

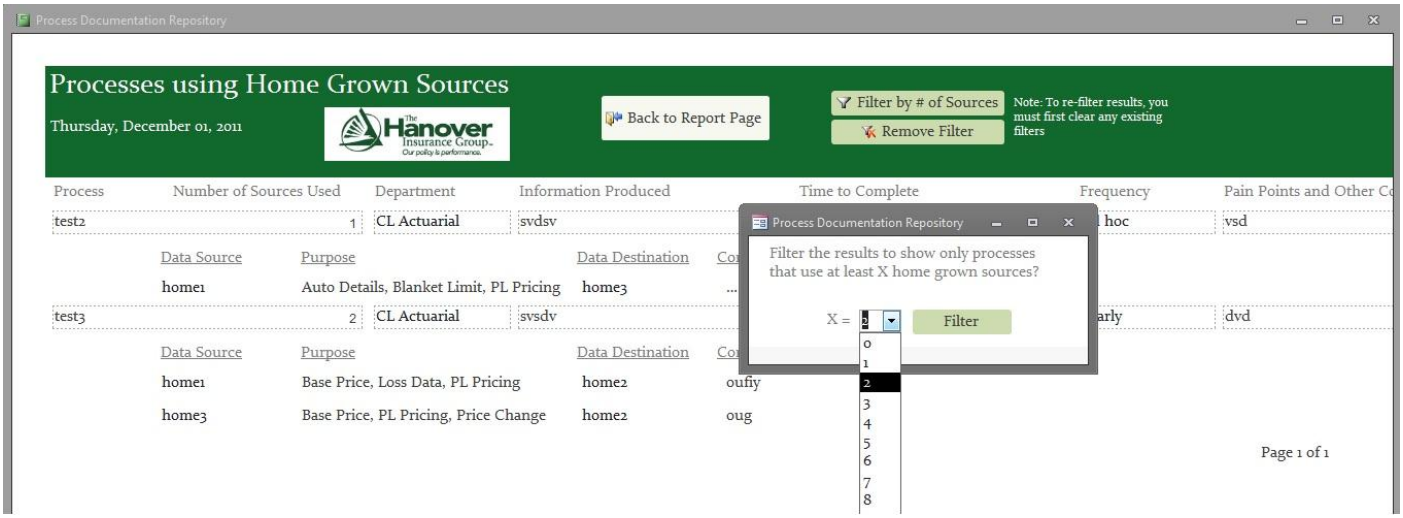
Reports

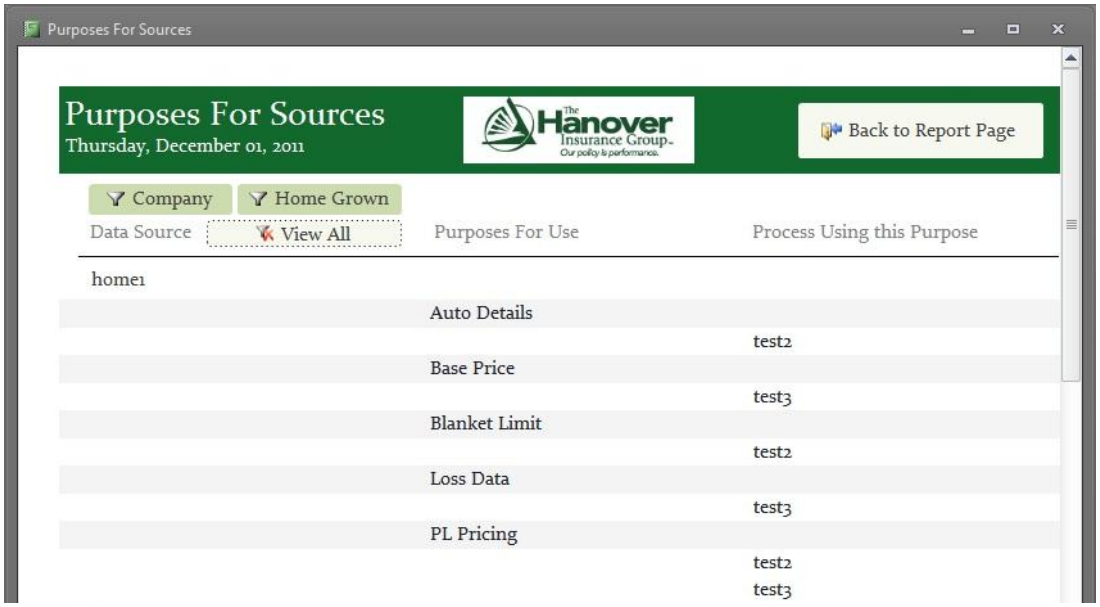
There are a couple different types of reports that you can generate using this tool. As discussed in the previous section, if you select a report using one of the buttons with the clipboard, then one of the reports will look like the figure below.



This form will display all the results in an organized manner, as well as provide you with the means to go back to both the search, and the original reports home page using their respective buttons.

The second type of report uses dynamic filtering right on the report itself. Instead of pre-selecting an option using a combo box, the user will have filter buttons on the report as shown in the figures below. This first one shows a filtering method that will prompt the user to again select the criteria, but this time it will update on the report right away.





The bottom figure of the two above shows a method in which the report only has two options to filter, and therefore no pop-up box will occur. This method of filtering will only occur on the 'Purposes for All Sources' report.

Frequently Asked Questions

Q: What is the main benefit of using this tool?

A: There are actually several benefits. But to summarize, this tool is meant to consolidate all the documentation data into one central location so that it can be searched and reported simply and efficiently. Instead of keeping all the records on some SharePoint site, all the necessary information for the Business Intelligence team can be accessed right here in the Process Documentation Repository.

Q: Who has access to the data?

A: It depends what you mean when defining 'data'. We have split this project into two parts. This tool belongs to the MIS team and will be managed mostly by Kim Killeen's team (or whomever she delegates it to). They will be the ones with direct access to the underlying database schema and the technical information. However, the high-level documentation can be found on 'Datapedia' right on Hanover's intranet. This way, there is a separation of the different types of users (general vs. technical) and the information cannot be tampered with if it is not meant to be.

Q: Why can't I add a data summary line before adding both the process and source information into the database first?

A: It may seem like a pain, but in order to maintain data integrity this is a necessary step. Think of it this way: Without the process there would be no data summary, and without the sources the process would have nowhere to get information. The data summary lines cannot exist without the presence of both integral pieces first.

Appendix F – Technical Documentation for PDR

The following information is to allow potential future developers to continue working based on the foundations we provide in our prototype. It includes the entity and attributes descriptions, documentation (with comments) for our code, and also the SQL queries used to assist in reporting for the final system.

Entities and Attributes

Entity Name	Field/Attribute Name	Data Type	Description
Processes	ProcessName	Text (varchar)	Name of the process, used as the primary key
	Department	Text (varchar)	Department to which the process belongs to, part of a finite drop down list to increase integrity
	InformationProduced	Memo (long)	Outlines the output of the process or report
	TimeToComplete	Text (varchar)	Includes the hours to be completed and the number of people who work on it
	Frequency	Text (varchar)	How often the process is executed, it part of a finite drop down list
	ReceiversBusArea	Text (varchar)	The area of business in which the users of the output work, can be many areas
	EnvisionSelfService	Yes/No (boolean)	Checked 'yes' if the user believes the process can be helped using Business Intelligence
	AdditionalSpecifications	Memo (long)	Any pertinent additional information not covered in the previous fields
	PainPointsComments	Memo (long)	Addresses the key pain points of the process and comments on them
CompanySources	SourceName	Text (varchar)	The name of the data source, used as the primary key
	Description	Memo (long)	High-level description that encompasses what it contains
	Format	Text (varchar)	Identifies the type of

Entity Name	Field/Attribute Name	Data Type	Description
			source, i.e. – Hyperion, Oracle DB, etc. (on a finite drop down list)
	Comments	Memo (long)	Any other pertinent information not mentioned in the previous fields
HomeGrownSources	HomeGrownName	Text (varchar)	The name of the source, used as the primary key
	Description	Memo (long)	High-level description that encompasses what the data source is, what it contains, etc
	Format	Text (varchar)	Identifies the type of source, i.e. – Hyperion query, SAS server, etc. (on a finite drop down list)
	FinalReport	Yes/No (boolean)	Identifies if the 'source' is the final report for any given process
	Comments	Memo (long)	Any other pertinent information not mentioned in the previous fields
DataSummary	Process	Text (varchar)	The name of the process using a data source, part of the composite primary key (a drop down list from the values in process name from processes)
	DataSource	Text (varchar)	The name of the data source used by the process in the field above, the second part of the composite primary key (a drop down list from the values of source name and home grown name from company and home grown sources
	Purpose	Memo (long)	Explains at a high-level what information is pulled or extracted from each

Entity Name	Field/Attribute Name	Data Type	Description
			process / data source combination – Formatted as a multi-valued attribute for data integrity
	DataDestination	Text (varchar	After any queries, data dumps, etc. are run… this is where the data flows into (a drop down list from the values of home grown name from home grown sources)
	Comments	Memo (long)	Any other pertinent information not mentioned in the previous fields

VBA for Forms

Menu Forms

Switchboard

```
'------------------------------------------------------------
' GoToProcesses_Click
' Brings the user to the Processes form to add/edit the data
'------------------------------------------------------------
Private Sub GoToProcesses_Click()
On Error GoTo GoToProcesses_Click_Err

    DoCmd.OpenForm "frmProcesses", acNormal, "", "", , acNormal

GoToProcesses_Click_Exit:
    Exit Sub

GoToProcesses_Click_Err:
    MsgBox Error$
    Resume GoToProcesses_Click_Exit

End Sub

'------------------------------------------------------------
' GoToSources_Click
' Brings up a the pop-up box for the user to choose which type of source they would like to view the info
for
'------------------------------------------------------------
Private Sub GoToSources_Click()
On Error GoTo GoToSources_Click_Err
```

```
    DoCmd.OpenForm "pop_up_SourceType", acNormal, "", "", , acNormal

GoToSources_Click_Exit:
    Exit Sub

GoToSources_Click_Err:
    MsgBox Error$
    Resume GoToSources_Click_Exit

End Sub

'------------------------------------------------------------
' GoToDataSummary_Click
' Brings the user to the Data Summary section to add/edit the various lines of summary data
'------------------------------------------------------------
Private Sub GoToDataSummary_Click()
On Error GoTo GoToDataSummary_Click_Err

    DoCmd.OpenForm "frmDataSummary", acNormal, "", "", , acNormal

GoToDataSummary_Click_Exit:
    Exit Sub

GoToDataSummary_Click_Err:
    MsgBox Error$
    Resume GoToDataSummary_Click_Exit

End Sub

'------------------------------------------------------------
' SearchAndReport_Click
' Brings the user to a second menu screen that navigatates the various options for reporting
'------------------------------------------------------------
Private Sub SearchAndReport_Click()
On Error GoTo SearchAndReport_Click_Err

    DoCmd.OpenForm "frmReportHome", acNormal, "", "", , acNormal

SearchAndReport_Click_Exit:
    Exit Sub

SearchAndReport_Click_Err:
    MsgBox Error$
    Resume SearchAndReport_Click_Exit

End Sub

'------------------------------------------------------------
' OpenHelp_Click
' Brings the user to the help page to view the terminology and the general rules for using the tool
'------------------------------------------------------------
```

```
Private Sub OpenHelp_Click()
On Error GoTo OpenHelp_Click_Err

    DoCmd.OpenForm "HelpPage", acNormal, "", "", , acNormal

OpenHelp_Click_Exit:
    Exit Sub

OpenHelp_Click_Err:
    MsgBox Error$
    Resume OpenHelp_Click_Exit

End Sub
```

Report Generation Home Page

```
'---------------------------------------------------------------
' ViewDataSummaries_Click
' Opens a pop-up box that asks the user which process they would like to view the summary for.
'---------------------------------------------------------------
Private Sub ViewDataSummaries_Click()
On Error GoTo ViewDataSummaries_Click_Err

    DoCmd.OpenForm "qryProcessSummaries", acNormal, "", "", , acNormal

ViewDataSummaries_Click_Exit:
    Exit Sub

ViewDataSummaries_Click_Err:
    MsgBox Error$
    Resume ViewDataSummaries_Click_Exit

End Sub

'---------------------------------------------------------------
' ViewProcessesUsingCS_Click
' Produces an MS Access Report based on the SQL Query 'Processes with 3CS'.
'---------------------------------------------------------------
Private Sub ViewProcessesUsingCS_Click()
On Error GoTo ViewProcessesUsingCS_Click_Err

    DoCmd.OpenReport "rptProcessesUsingCS", acViewReport, "", "", acNormal

ViewProcessesUsingCS_Click_Exit:
    Exit Sub

ViewProcessesUsingCS_Click_Err:
    MsgBox Error$
    Resume ViewProcessesUsingCS_Click_Exit

End Sub
```

```
'-------------------------------------------------------------
' ViewProcessesBySource_Click
' Opens a pop-up box which asks the user which source they would like to view the processes for.
'-------------------------------------------------------------
Private Sub ViewProcessesBySource_Click()
On Error GoTo ViewProcessesBySource_Click_Err

    DoCmd.OpenForm "qryProcessesBySource", acNormal, "", "", , acNormal

ViewProcessesBySource_Click_Exit:
    Exit Sub

ViewProcessesBySource_Click_Err:
    MsgBox Error$
    Resume ViewProcessesBySource_Click_Exit

End Sub

'-------------------------------------------------------------
' ViewProcessesByDept_Click
' Opens a pop-up box which asks the user which department they would like to view the processes for.
'-------------------------------------------------------------
Private Sub ViewProcessesByDept_Click()
On Error GoTo ViewProcessesByDept_Click_Err

    DoCmd.OpenForm "qryProcessesByDept", acNormal, "", "", , acNormal

ViewProcessesByDept_Click_Exit:
    Exit Sub

ViewProcessesByDept_Click_Err:
    MsgBox Error$
    Resume ViewProcessesByDept_Click_Exit

End Sub

'-------------------------------------------------------------
' ViewProcessesUsingHG_Click
' Produces an MS Access Report based on the SQL Query 'Processes with 2HG'.
'-------------------------------------------------------------
Private Sub ViewProcessesUsingHG_Click()
On Error GoTo ViewProcessesUsingHG_Click_Err

    DoCmd.OpenReport "rptProcessesUsingHG", acViewReport, "", "", acNormal

ViewProcessesUsingHG_Click_Exit:
    Exit Sub

ViewProcessesUsingHG_Click_Err:
    MsgBox Error$
```

```
    Resume ViewProcessesUsingHG_Click_Exit

End Sub

'------------------------------------------------------------
' ViewFinalAsSources_Click
' Produces an MS Access Report based on the SQL Query 'Final Reports Used Elsewhere'.
'------------------------------------------------------------
Private Sub ViewFinalAsSources_Click()
On Error GoTo ViewFinalAsSources_Click_Err

    DoCmd.OpenReport "rptFinalReportsUsedAsSources", acViewReport, "", "", acNormal

ViewFinalAsSources_Click_Exit:
    Exit Sub

ViewFinalAsSources_Click_Err:
    MsgBox Error$
    Resume ViewFinalAsSources_Click_Exit

End Sub

'------------------------------------------------------------
' OpenHelp_Click
' Brings the user to the help page that explains terminology and general usage for the tool.
'------------------------------------------------------------
Private Sub OpenHelp_Click()
On Error GoTo OpenHelp_Click_Err

    DoCmd.OpenForm "HelpPage_Reports", acNormal, "", "", , acNormal

OpenHelp_Click_Exit:
    Exit Sub

OpenHelp_Click_Err:
    MsgBox Error$
    Resume OpenHelp_Click_Exit

End Sub

'------------------------------------------------------------
' ViewPurposesForSources_Click
' opens the report to view all the purposes for each source
'------------------------------------------------------------
Private Sub ViewPurposesForSources_Click()
On Error GoTo ViewPurposesForSources_Click_Err

    DoCmd.OpenReport "rptPurposesForSources", acViewReport, "", "", acNormal

ViewPurposesForSources_Click_Exit:
    Exit Sub
```

```
ViewPurposesForSources_Click_Err:
    MsgBox Error$
    Resume ViewPurposesForSources_Click_Exit

End Sub

'------------------------------------------------------------
' GoBack_Click
' brings the user back to the switchboard and closes the current form
'------------------------------------------------------------
Private Sub GoBack_Click()
On Error GoTo GoBack_Click_Err

    DoCmd.Close acForm, "frmReportHome"
    DoCmd.OpenForm "Switchboard", acNormal, "", "", , acNormal

GoBack_Click_Exit:
    Exit Sub

GoBack_Click_Err:
    MsgBox Error$
    Resume GoBack_Click_Exit
```

Entry Forms

Company Sources Entry

```
'------------------------------------------------------------
' SelectSource_AfterUpdate
' This object is the combo box at the top of the form. Once selected, the form updates the data to be based
on the key selected in the box.
'------------------------------------------------------------
Private Sub SelectSource_AfterUpdate()
On Error GoTo SelectSource_AfterUpdate_Err

    DoCmd.SearchForRecord , "", acFirst, "[SourceName] = " & "'" & Screen.ActiveControl & "'"

SelectSource_AfterUpdate_Exit:
    Exit Sub

SelectSource_AfterUpdate_Err:
    MsgBox Error$
    Resume SelectSource_AfterUpdate_Exit

End Sub

'------------------------------------------------------------
' SaveCompanySource_Click
```

```
' Simply saves the record entered by the user. Will allow most input, but only if the primary key is entered
correctly.
'-------------------------------------------------------------
Private Sub SaveCompanySource_Click()
On Error GoTo SaveCompanySource_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdSaveRecord
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

SaveCompanySource_Click_Exit:
    Exit Sub

SaveCompanySource_Click_Err:
    MsgBox Error$
    Resume SaveCompanySource_Click_Exit

End Sub

'-------------------------------------------------------------
' ResetCompanySource_Click
' Will undo all changes to the record since the user opened the form to that record. It will throw an error if
no changes can be undone.
'-------------------------------------------------------------
Private Sub ResetCompanySource_Click()
On Error GoTo ResetCompanySource_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdUndo
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

ResetCompanySource_Click_Exit:
    Exit Sub

ResetCompanySource_Click_Err:
    MsgBox Error$
    Resume ResetCompanySource_Click_Exit

End Sub

'-------------------------------------------------------------
' CloseCompanySource_Click
' Closes the current form. Will prompt the user to save if not done so already.
'-------------------------------------------------------------
Private Sub CloseCompanySource_Click()
```

```
On Error GoTo CloseCompanySource_Click_Err

    DoCmd.Close , ""

CloseCompanySource_Click_Exit:
    Exit Sub

CloseCompanySource_Click_Err:
    MsgBox Error$
    Resume CloseCompanySource_Click_Exit

End Sub

'------------------------------------------------------------
' AddCompanySource_Click
' Creates a new (blank) record for the user to be able to enter in new information on a Company Source.
'------------------------------------------------------------
Private Sub AddCompanySource_Click()
On Error GoTo AddCompanySource_Click_Err

    On Error Resume Next
    DoCmd.GoToRecord , "", acNewRec
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

AddCompanySource_Click_Exit:
    Exit Sub

AddCompanySource_Click_Err:
    MsgBox Error$
    Resume AddCompanySource_Click_Exit

End Sub

'------------------------------------------------------------
' DeleteCompanySource_Click
' Will remove the current record from the database. Will prompt the user to be sure they actually want to
delete a record.
'------------------------------------------------------------
Private Sub DeleteCompanySource_Click()
On Error GoTo DeleteCompanySource_Click_Err

    On Error Resume Next
    DoCmd.GoToControl Screen.PreviousControl.Name
    Err.Clear
    If (Not Form.NewRecord) Then
        DoCmd.RunCommand acCmdDeleteRecord
    End If
    If (Form.NewRecord And Not Form.Dirty) Then
```

```
    Beep
  End If
  If (Form.NewRecord And Form.Dirty) Then
    DoCmd.RunCommand acCmdUndo
  End If
  If (MacroError <> 0) Then
    Beep
    MsgBox MacroError.Description, vbOKOnly, ""
  End If

DeleteCompanySource_Click_Exit:
  Exit Sub

DeleteCompanySource_Click_Err:
  MsgBox Error$
  Resume DeleteCompanySource_Click_Exit

End Sub
```

Data Summary Entry

```
'---------------------------------------------------------------
' combo_Process_AfterUpdate
' This object is the combo box at the top of the form for process. Once selected, the form updates the data
to be based on the key selected in the box.
'---------------------------------------------------------------
Private Sub combo_process_AfterUpdate()
On Error GoTo combo_process_AfterUpdate_Err

  DoCmd.SearchForRecord , "", acFirst, "[Process] = " & "'" & Screen.ActiveControl & "'"
  DoCmd.Requery "combo_Source"

combo_process_AfterUpdate_Exit:
  Exit Sub

combo_process_AfterUpdate_Err:
  MsgBox Error$
  Resume combo_process_AfterUpdate_Exit

End Sub

'---------------------------------------------------------------
' combo_Source_AfterUpdate
' This object is the combo box at the top of the form for sources. Once selected, the form updates the data
to based on the key selected in the box.
' It is populated using the sources that belong to the process from the combo box above.
'---------------------------------------------------------------
Private Sub combo_Source_AfterUpdate()
On Error GoTo combo_Source_AfterUpdate_Err

  DoCmd.SearchForRecord , "", acFirst, "[DataSource] = " & "'" & Screen.ActiveControl & "'"
```

```
combo_Source_AfterUpdate_Exit:
   Exit Sub

combo_Source_AfterUpdate_Err:
   MsgBox Error$
   Resume combo_Source_AfterUpdate_Exit

End Sub

'------------------------------------------------------------
' NextLine_Click
' Moves the focus of the form to the next line entry of the data summary.
'------------------------------------------------------------
Private Sub NextLine_Click()
On Error GoTo NextLine_Click_Err

   On Error Resume Next
   DoCmd.GoToRecord , "", acNext
   If (MacroError <> 0) Then
      Beep
      MsgBox MacroError.Description, vbOKOnly, ""
   End If

NextLine_Click_Exit:
   Exit Sub

NextLine_Click_Err:
   MsgBox Error$
   Resume NextLine_Click_Exit

End Sub

'------------------------------------------------------------
' PrevLine_Click
' Moves the focus of the form to the previous line entry of the data summary.
'------------------------------------------------------------
Private Sub PrevLine_Click()
On Error GoTo PrevLine_Click_Err

   On Error Resume Next
   DoCmd.GoToRecord , "", acPrevious
   If (MacroError <> 0) Then
      Beep
      MsgBox MacroError.Description, vbOKOnly, ""
   End If

PrevLine_Click_Exit:
   Exit Sub

PrevLine_Click_Err:
```

```
    MsgBox Error$
    Resume PrevLine_Click_Exit

End Sub

'-------------------------------------------------------------
' OpenProcesses_Click
' Brings the user to the processes form to enter a new process if they don't see it in the drop down list.
'-------------------------------------------------------------
Private Sub OpenProcesses_Click()
On Error GoTo OpenProcesses_Click_Err

    DoCmd.OpenForm "frmProcesses", acNormal, "", "", , acNormal

OpenProcesses_Click_Exit:
    Exit Sub

OpenProcesses_Click_Err:
    MsgBox Error$
    Resume OpenProcesses_Click_Exit

End Sub

'-------------------------------------------------------------
' OpenSource_Click
' Brings the user to the pop-up form that prompts them to choose the type of source in which they want to
view/add/edit
'-------------------------------------------------------------
Private Sub OpenSource_Click()
On Error GoTo OpenSource_Click_Err

    DoCmd.OpenForm "pop_up_SourceType", acNormal, "", "", , acNormal

OpenSource_Click_Exit:
    Exit Sub

OpenSource_Click_Err:
    MsgBox Error$
    Resume OpenSource_Click_Exit

End Sub

'-------------------------------------------------------------
' SaveDataSummary_Click
' Saves all changes to the current form. Will allow the user to exit the form without any error dialogue.
'-------------------------------------------------------------
Private Sub SaveDataSummary_Click()
On Error GoTo SaveDataSummary_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdSaveRecord
```

```
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If
    DoCmd.OpenForm "pop_up-AddSource", acNormal, "", "", , acNormal

SaveDataSummary_Click_Exit:
    Exit Sub

SaveDataSummary_Click_Err:
    MsgBox Error$
    Resume SaveDataSummary_Click_Exit

End Sub

'---------------------------------------------------------
' ResetDataSummary_Click
' Will reset any changes made since the user opened the form and is on the same record. An error will be
thrown if no changes can be undone.
'---------------------------------------------------------
Private Sub ResetDataSummary_Click()
On Error GoTo ResetDataSummary_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdUndo
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

ResetDataSummary_Click_Exit:
    Exit Sub

ResetDataSummary_Click_Err:
    MsgBox Error$
    Resume ResetDataSummary_Click_Exit

End Sub

'---------------------------------------------------------
' CloseCompanySource_Click
' Closes the current form and prompts the user to save if not done so already.
'---------------------------------------------------------
Private Sub CloseCompanySource_Click()
On Error GoTo CloseCompanySource_Click_Err

    DoCmd.Close , ""

CloseCompanySource_Click_Exit:
    Exit Sub
```

```
CloseCompanySource_Click_Err:
   MsgBox Error$
   Resume CloseCompanySource_Click_Exit

End Sub

'------------------------------------------------------------
' AddDataSummary_Click
' Creates a new (blank) summary line for the user to enter in the appropriate information.
'------------------------------------------------------------
Private Sub AddDataSummary_Click()
On Error GoTo AddDataSummary_Click_Err

   On Error Resume Next
   DoCmd.GoToRecord , "", acNewRec
   If (MacroError <> 0) Then
      Beep
      MsgBox MacroError.Description, vbOKOnly, ""
   End If

AddDataSummary_Click_Exit:
   Exit Sub

AddDataSummary_Click_Err:
   MsgBox Error$
   Resume AddDataSummary_Click_Exit

End Sub

'------------------------------------------------------------
' DeleteDataSummary_Click
' Simply deletes the current record and its information from the database. Will prompt the user to be sure
he/she wants to delete the record.
'------------------------------------------------------------
Private Sub DeleteDataSummary_Click()
On Error GoTo DeleteDataSummary_Click_Err

   On Error Resume Next
   DoCmd.GoToControl Screen.PreviousControl.Name
   Err.Clear
   If (Not Form.NewRecord) Then
      DoCmd.RunCommand acCmdDeleteRecord
   End If
   If (Form.NewRecord And Not Form.Dirty) Then
      Beep
   End If
   If (Form.NewRecord And Form.Dirty) Then
      DoCmd.RunCommand acCmdUndo
   End If
   If (MacroError <> 0) Then
      Beep
```

```
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

DeleteDataSummary_Click_Exit:
    Exit Sub

DeleteDataSummary_Click_Err:
    MsgBox Error$
    Resume DeleteDataSummary_Click_Exit

End Sub
```

Home Grown Sources Entry

```
'---------------------------------------------------------
' SelectSource_AfterUpdate
' This object is the combo box at the top of the form. Once selected, the form updates the data to based on the key selected in the box.
'---------------------------------------------------------
Private Sub SelectSource_AfterUpdate()
On Error GoTo SelectSource_AfterUpdate_Err

    DoCmd.SearchForRecord , "", acFirst, "[HomeGrownName] = " & "'" & Screen.ActiveControl & "'"


SelectSource_AfterUpdate_Exit:
    Exit Sub

SelectSource_AfterUpdate_Err:
    MsgBox Error$
    Resume SelectSource_AfterUpdate_Exit

End Sub

'---------------------------------------------------------
' SaveHomeSource_Click
' Simply saves the source information currently entered in the form.
'---------------------------------------------------------
Private Sub SaveHomeSource_Click()
On Error GoTo SaveHomeSource_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdSaveRecord
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

SaveHomeSource_Click_Exit:
    Exit Sub
```

```
SaveHomeSource_Click_Err:
    MsgBox Error$
    Resume SaveHomeSource_Click_Exit

End Sub

'------------------------------------------------------------
' ResetHomeSource_Click
' Will reset all changes made since the user has had the form open on the particular record. Will throw and error if no changes can be undone.
'------------------------------------------------------------
Private Sub ResetHomeSource_Click()
On Error GoTo ResetHomeSource_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdUndo
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

ResetHomeSource_Click_Exit:
    Exit Sub

ResetHomeSource_Click_Err:
    MsgBox Error$
    Resume ResetHomeSource_Click_Exit

End Sub

'------------------------------------------------------------
' CloseHomeSource_Click
' Closes the current window. Will prompt the user to save the data if not done so already.
'------------------------------------------------------------
Private Sub CloseHomeSource_Click()
On Error GoTo CloseHomeSource_Click_Err

    DoCmd.Close , ""

CloseHomeSource_Click_Exit:
    Exit Sub

CloseHomeSource_Click_Err:
    MsgBox Error$
    Resume CloseHomeSource_Click_Exit

End Sub

'------------------------------------------------------------
' AddHomeSource_Click
```

```
' Adds a new (blank) record to the form. Allows the user to input information as long as the primary key
is correct.
'-------------------------------------------------------------
Private Sub AddHomeSource_Click()
On Error GoTo AddHomeSource_Click_Err

    On Error Resume Next
    DoCmd.GoToRecord , "", acNewRec
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

AddHomeSource_Click_Exit:
    Exit Sub

AddHomeSource_Click_Err:
    MsgBox Error$
    Resume AddHomeSource_Click_Exit

End Sub

'-------------------------------------------------------------
' DeleteHomeSource_Click
' Removes the current record from the database. Will prompt the user before deleting to be sure it is what
the user wants.
'-------------------------------------------------------------
Private Sub DeleteHomeSource_Click()
On Error GoTo DeleteHomeSource_Click_Err

    On Error Resume Next
    DoCmd.GoToControl Screen.PreviousControl.Name
    Err.Clear
    If (Not Form.NewRecord) Then
        DoCmd.RunCommand acCmdDeleteRecord
    End If
    If (Form.NewRecord And Not Form.Dirty) Then
        Beep
    End If
    If (Form.NewRecord And Form.Dirty) Then
        DoCmd.RunCommand acCmdUndo
    End If
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

DeleteHomeSource_Click_Exit:
    Exit Sub

DeleteHomeSource_Click_Err:
```

```
    MsgBox Error$
    Resume DeleteHomeSource_Click_Exit

End Sub
```

Processes Entry

```
'------------------------------------------------------------
' combo_process_AfterUpdate
' This object is the combo box at the top of the form for process. Once selected, the form updates the data
to based on the key selected in the box.
'------------------------------------------------------------
Private Sub combo_process_AfterUpdate()
On Error GoTo combo_process_AfterUpdate_Err

   DoCmd.SearchForRecord , "", acFirst, "[ProcessName] = " & "'" & Screen.ActiveControl & "'"

combo_process_AfterUpdate_Exit:
    Exit Sub

combo_process_AfterUpdate_Err:
    MsgBox Error$
    Resume combo_process_AfterUpdate_Exit

End Sub

'------------------------------------------------------------
' ViewDataSummary_Click
' Opens the pop-up box which prompts the user to select the appropriate process to view the data
summary report.
'------------------------------------------------------------
Private Sub ViewDataSummary_Click()
On Error GoTo ViewDataSummary_Click_Err

    DoCmd.OpenForm "qryProcessSummaries", acNormal, "", "", , acNormal

ViewDataSummary_Click_Exit:
    Exit Sub

ViewDataSummary_Click_Err:
    MsgBox Error$
    Resume ViewDataSummary_Click_Exit

End Sub

'------------------------------------------------------------
' SaveProcess_Click
' Simply saves the current record on the form.
'------------------------------------------------------------
Private Sub SaveProcess_Click()
On Error GoTo SaveProcess_Click_Err
```

```
    On Error Resume Next
    DoCmd.RunCommand acCmdSaveRecord
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

SaveProcess_Click_Exit:
    Exit Sub

SaveProcess_Click_Err:
    MsgBox Error$
    Resume SaveProcess_Click_Exit

End Sub

'---------------------------------------------------------
' ResetProcess_Click
' Will reset all changes made to the form since the user first navigated to it. Will throw error if no changes
can be undone.
'---------------------------------------------------------
Private Sub ResetProcess_Click()
On Error GoTo ResetProcess_Click_Err

    On Error Resume Next
    DoCmd.RunCommand acCmdUndo
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

ResetProcess_Click_Exit:
    Exit Sub

ResetProcess_Click_Err:
    MsgBox Error$
    Resume ResetProcess_Click_Exit

End Sub

'---------------------------------------------------------
' CloseProcesses_Click
' Closes the current form. Will prompt the user to save if not done so already.
'---------------------------------------------------------
Private Sub CloseProcesses_Click()
On Error GoTo CloseProcesses_Click_Err

    DoCmd.Close , ""

CloseProcesses_Click_Exit:
```

```
    Exit Sub

CloseProcesses_Click_Err:
    MsgBox Error$
    Resume CloseProcesses_Click_Exit

End Sub

'------------------------------------------------------------
' AddProcess_Click
' Creates a new (blank) record for the user to be able to enter new data for a process.
'------------------------------------------------------------
Private Sub AddProcess_Click()
On Error GoTo AddProcess_Click_Err

    On Error Resume Next
    DoCmd.GoToRecord , "", acNewRec
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

AddProcess_Click_Exit:
    Exit Sub

AddProcess_Click_Err:
    MsgBox Error$
    Resume AddProcess_Click_Exit

End Sub

'------------------------------------------------------------
' DeleteProcess_Click
' Removes the current record and its information from the database. Prompts the user before deletion to be
sure it is what the user wants.
'------------------------------------------------------------
Private Sub DeleteProcess_Click()
On Error GoTo DeleteProcess_Click_Err

    On Error Resume Next
    DoCmd.GoToControl Screen.PreviousControl.Name
    Err.Clear
    If (Not Form.NewRecord) Then
        DoCmd.RunCommand acCmdDeleteRecord
    End If
    If (Form.NewRecord And Not Form.Dirty) Then
        Beep
    End If
    If (Form.NewRecord And Form.Dirty) Then
        DoCmd.RunCommand acCmdUndo
    End If
```

```
    If (MacroError <> 0) Then
        Beep
        MsgBox MacroError.Description, vbOKOnly, ""
    End If

DeleteProcess_Click_Exit:
    Exit Sub

DeleteProcess_Click_Err:
    MsgBox Error$
    Resume DeleteProcess_Click_Exit

End Sub
```

Pop-Up Windows

Choose which source type to add

```
'---------------------------------------------------------
' GoToCompanySources_Click
' Brings the user to a form where they can view/add/edit the company source table.
'---------------------------------------------------------
Private Sub GoToCompanySources_Click()
On Error GoTo GoToCompanySources_Click_Err

    DoCmd.OpenForm "frmCompanySources", acNormal, "", "", , acNormal
    DoCmd.Close acForm, "pop_up_SourceType"


GoToCompanySources_Click_Exit:
    Exit Sub

GoToCompanySources_Click_Err:
    MsgBox Error$
    Resume GoToCompanySources_Click_Exit

End Sub

'---------------------------------------------------------
' GoToHGSources_Click
' Brings the user to a form where they can view/add/edit the home grown source table.
'---------------------------------------------------------
Private Sub GoToHGSources_Click()
On Error GoTo GoToHGSources_Click_Err

    DoCmd.OpenForm "frmHomeGrownSources", acNormal, "", "", , acNormal
    DoCmd.Close acForm, "pop_up_SourceType"

GoToHGSources_Click_Exit:
    Exit Sub
```

```
GoToHGSources_Click_Err:
    MsgBox Error$
    Resume GoToHGSources_Click_Exit

End Sub
```

Add new summary line?

```
'---------------------------------------------------------
' GoBackToSummary_Click
' Brings the user back to the summary form so that they can add more lines to the summary for the current process.
'---------------------------------------------------------
Private Sub GoBackToSummary_Click()
On Error GoTo GoBackToSummary_Click_Err

    DoCmd.OpenForm "frmDataSummary", acNormal, "", "", acAdd, acNormal
    DoCmd.Close acForm, "pop_up-AddSource"

GoBackToSummary_Click_Exit:
    Exit Sub

GoBackToSummary_Click_Err:
    MsgBox Error$
    Resume GoBackToSummary_Click_Exit

End Sub

'---------------------------------------------------------
' GoToSwitchboard_Click
' Exits this form and the data summary form and brings the user back to the main switchboard.
'---------------------------------------------------------
Private Sub GoToSwitchboard_Click()
On Error GoTo GoToSwitchboard_Click_Err

    DoCmd.OpenForm "Switchboard", acNormal, "", "", , acNormal
    DoCmd.Close acForm, "pop_up-AddSource"

GoToSwitchboard_Click_Exit:
    Exit Sub

GoToSwitchboard_Click_Err:
    MsgBox Error$
    Resume GoToSwitchboard_Click_Exit

End Sub
```

Filtering Results (3 versions)

```
'---------------------------------------------------------
' FilterResults_Click
```

```
' filters the specified report to results that only have counts higher than the specified number in the combo box
'-------------------------------------------------------------
Private Sub FilterResults_Click()
On Error GoTo FilterResults_Click_Err

    DoCmd.OpenReport "rptProcessesUsingCS", acViewReport, "", "", acNormal
    DoCmd.SetFilter "FilterCount", "[Processes using CS]![SourcesUsed]>=[Forms]![pop_up_CSFilterCount]![combo_FilterCount]", ""
    DoCmd.Close acForm, "pop_up_CSFilterCount"


FilterResults_Click_Exit:
    Exit Sub

FilterResults_Click_Err:
    MsgBox Error$
    Resume FilterResults_Click_Exit

End Sub
```

Note: 'SetFilter' command varies depending on the report used and the count variable

Report Generators

Create Process Summaries

```
'-------------------------------------------------------------
' SpecificSummaries_Click
' brings the user to the data summary (in report form) for the selected process from the combo box
'-------------------------------------------------------------
Private Sub SpecificSummaries_Click()
On Error GoTo SpecificSummaries_Click_Err

    DoCmd.OpenReport "rptSpecificDataSummaries", acViewReport, "", "", acNormal
    DoCmd.Close acForm, "qryProcessSummaries"


SpecificSummaries_Click_Exit:
    Exit Sub

SpecificSummaries_Click_Err:
    MsgBox Error$
    Resume SpecificSummaries_Click_Exit

End Sub

'-------------------------------------------------------------
' AllSummaries_Click
```

```
' brings the user to the report for ALL the data summaries organized by process
'-------------------------------------------------------------
Private Sub AllSummaries_Click()
On Error GoTo AllSummaries_Click_Err

    DoCmd.OpenReport "rptAllDataSummaries", acViewReport, "", "", acNormal
    DoCmd.Close acForm, "qryProcessSummaries"

AllSummaries_Click_Exit:
    Exit Sub

AllSummaries_Click_Err:
    MsgBox Error$
    Resume AllSummaries_Click_Exit

End Sub
```

Processes by Department

```
'-------------------------------------------------------------
' Command2_Click
' Produces an MS Access Report based on the SQL Query 'Processes by Department'.
'-------------------------------------------------------------
Private Sub Command2_Click()
On Error GoTo Command2_Click_Err

    DoCmd.OpenReport "rptDepartmantProcesses", acViewReport, "", "", acNormal
    DoCmd.Close acForm, "qryProcessesByDept"

Command2_Click_Exit:
    Exit Sub

Command2_Click_Err:
    MsgBox Error$
    Resume Command2_Click_Exit

End Sub
```

Processes by Source

```
'-------------------------------------------------------------
' SpecificSource_Click
' brings the user to a report of process information that use the source they specified in the combo box on
the form
'-------------------------------------------------------------
Private Sub SpecificSource_Click()
On Error GoTo SpecificSource_Click_Err

    DoCmd.OpenReport "rptSpecificProcessesBySource", acViewReport, "", "", acNormal
    DoCmd.Close acForm, "qryProcessesBySource"
```

```
SpecificSource_Click_Exit:
    Exit Sub

SpecificSource_Click_Err:
    MsgBox Error$
    Resume SpecificSource_Click_Exit

End Sub


'------------------------------------------------------------
' AllSources_Click
' brings the user to a report showing all sources and each of the processes that utilize each source
'------------------------------------------------------------
Private Sub AllSources_Click()
On Error GoTo AllSources_Click_Err

    DoCmd.OpenReport "rptAllProcessesBySource", acViewReport, "", "", acNormal
    DoCmd.Close acForm, "qryProcessesBySource"

AllSources_Click_Exit:
    Exit Sub

AllSources_Click_Err:
    MsgBox Error$
    Resume AllSources_Click_Exit

End Sub
```

Reports

Reports Using Selectors

Each of the reports generated using these buttons has a similar format and coding. If only producing a specific object, then there will be a 'Back to Search' option on the report. For both specific objects and for viewing all objects, the forms have a 'Back to Reports' option. The basic code for those two buttons is shown below.

```
'------------------------------------------------------------
' BackToSearch_Click
' returns user back to search pop up in order to re-select the criteria for the report
'------------------------------------------------------------
Private Sub BackToSearch_Click()
On Error GoTo BackToSearch_Click_Err

    DoCmd.OpenForm "qryProcessSummaries", acNormal, "", "", , acNormal
    DoCmd.Close acReport, "rptSpecificDataSummaries"
```

```
BackToSearch_Click_Exit:
   Exit Sub

BackToSearch_Click_Err:
   MsgBox Error$
   Resume BackToSearch_Click_Exit

End Sub


'------------------------------------------------------------
' CloseReport_Click
' returns the user back to the report menu screen to select another report to generate
'------------------------------------------------------------
Private Sub CloseReport_Click()
On Error GoTo CloseReport_Click_Err

   DoCmd.Close acReport, "rptSpecificDataSummaries"

CloseReport_Click_Exit:
   Exit Sub

CloseReport_Click_Err:
   MsgBox Error$
   Resume CloseReport_Click_Exit

End Sub
```

Also, it is worth noting that these reports have specific record sources in order to generate the correct data. The record source for each report is as follows:

Specific Data Summaries = ‘Specific Data Summaries’ query
All Data Summaries = ‘DataSummary’ table
Specific Processes by Source = ‘Specific Processes by Source’ query
All Processes by Source = ‘All Processes by Source’ query’
Specific Processes by Department = ‘Specific Processes by Dept’ query
All Processes by Department = ‘Processes’ table

Reports Using Filters

The other four reports on the page all use some sort of filter to organize the data dynamically within the form. Three of the reports use one method and the final report uses a slightly different method since the filtering criteria is quite different. Both approaches are shown below:

```
'------------------------------------------------------------
' CloseReport_Click
' returns the user to the main reports page and also clears any existing filters from the report
'------------------------------------------------------------
Private Sub CloseReport_Click()
On Error GoTo CloseReport_Click_Err
```

```
    DoCmd.SetFilter "removefilter", "", ""
    DoCmd.Close acReport, "rptProcessesUsingHG"


CloseReport_Click_Exit:
    Exit Sub

CloseReport_Click_Err:
    MsgBox Error$
    Resume CloseReport_Click_Exit

End Sub


'---------------------------------------------------------
' FilterCount_Click
' opens the pop-up box to generate the filter criteria for the report
'---------------------------------------------------------
Private Sub FilterCount_Click()
On Error GoTo FilterCount_Click_Err

    DoCmd.OpenForm "pop_up_HGFilterCount", acNormal, "", "", , acNormal

FilterCount_Click_Exit:
    Exit Sub

FilterCount_Click_Err:
    MsgBox Error$
    Resume FilterCount_Click_Exit

End Sub


'---------------------------------------------------------
' RemoveFilter_Click
' refreshes the report and clears the filter from it in the process
'---------------------------------------------------------
Private Sub RemoveFilter_Click()
On Error GoTo RemoveFilter_Click_Err

    DoCmd.SetFilter "removefilter", "", ""
    DoCmd.Close acReport, "rptProcessesUsingHG"
    DoCmd.OpenReport "rptProcessesUsingHG", acViewReport, "", "", acNormal

RemoveFilter_Click_Exit:
    Exit Sub

RemoveFilter_Click_Err:
    MsgBox Error$
    Resume RemoveFilter_Click_Exit
```

```
End Sub
```

Note that the filtering criteria pop-up box has code in the 'Pop-Up' section of this documentation report. The second way of filtering is shown here:

```
'---------------------------------------------------------
' FilterAll_Click
' clears any filters in place by resetting the record source to the original query
'---------------------------------------------------------
Private Sub FilterAll_Click()
On Error GoTo FilterAll_Click_Err

    Dim criteria As String
    criteria = "SELECT DISTINCT DataSource, Purpose.Value, Process FROM DataSummary"
    Me.RecordSource = criteria

FilterAll_Click_Exit:
    Exit Sub

FilterAll_Click_Err:
    MsgBox Error$
    Resume FilterAll_Click_Exit

End Sub

'---------------------------------------------------------
' FilterCS_Click
' filters by setting the record source for the report to be only those where the data source is in the company
source table
'---------------------------------------------------------
Private Sub FilterCS_Click()
On Error GoTo FilterCS_Click_Err

    Dim criteria As String
    criteria = "SELECT DISTINCT DataSource, Purpose.Value, Process FROM DataSummary WHERE
DataSource IN (SELECT SourceName FROM CompanySources)"
    Me.RecordSource = criteria

FilterCS_Click_Exit:
    Exit Sub

FilterCS_Click_Err:
    MsgBox Error$
    Resume FilterCS_Click_Exit

End Sub

'---------------------------------------------------------
' FilterHG_Click
```

```
' filters by setting the record source for the report to be only those where the data source is in the home grown source table
'-------------------------------------------------------------
Private Sub FilterHG_Click()

    Dim criteria As String
    criteria = "SELECT DISTINCT DataSource, Purpose.Value, Process FROM DataSummary WHERE DataSource IN (SELECT HomeGrownName FROM HomeGrownSources)"
    Me.RecordSource = criteria

FilterHG_Click_Exit:
    Exit Sub

FilterHG_Click_Err:
    MsgBox Error$
    Resume FilterHG_Click_Exit

End Sub
'-------------------------------------------------------------
' CloseReport_Click
' returns the user to the main reports page
'-------------------------------------------------------------
Private Sub CloseReport_Click()
On Error GoTo CloseReport_Click_Err

    DoCmd.Close acReport, "rptPurposesForSources"

CloseReport_Click_Exit:
    Exit Sub

CloseReport_Click_Err:
    MsgBox Error$
    Resume CloseReport_Click_Exit

End Sub
```

Again, each of these reports are produced using specific record sources, and they are:

Processes Using Home Grown Sources = ‘Processes Using HG’ query
Processes Using Company Sources = ‘Processes Using CS’ query
Final Reports Used as Sources = ‘Final Reports Used as Sources’ query
Purposes for all sources = ‘Purposes for Sources’ query

Help Pages
Main

```
'-------------------------------------------------------------
' CloseHelp_Click
' returns the user back to the main switchboard
'-------------------------------------------------------------
```

```
Private Sub CloseHelp_Click()
On Error GoTo CloseHelp_Click_Err

    DoCmd.Close acForm, "HelpPage_Main"
    DoCmd.OpenForm "Switchboard", acNormal, "", "", , acNormal

CloseHelp_Click_Exit:
    Exit Sub

CloseHelp_Click_Err:
    MsgBox Error$
    Resume CloseHelp_Click_Exit

End Sub
```

Report

```
'---------------------------------------------------------
' CloseHelp_Click
' brings the user back to the report home page
'---------------------------------------------------------
Private Sub CloseHelp_Click()
On Error GoTo CloseHelp_Click_Err

    DoCmd.Close acForm, "HelpPage_Reports"
    DoCmd.OpenForm "frmReportHome", acNormal, "", "", , acNormal

CloseHelp_Click_Exit:
    Exit Sub

CloseHelp_Click_Err:
    MsgBox Error$
    Resume CloseHelp_Click_Exit

End Sub
```

SQL Queries

Final Reports Used As Sources

```
**Used to produce a list of final reports that are used as sources in other processes**
SELECT HomeGrownName, Description, Format, HomeGrownSources.Comments, Process, Purpose,
DataDestination, [Count FR In Processes].NumProcesses
FROM DataSummary, HomeGrownSources, [Count FR In Processes]
WHERE DataSummary.DataSource = HomeGrownSources.HomeGrownName
AND DataSummary.DataSource = [Count FR In Processes].DataSource
AND FinalReport = TRUE;
```

Specific Processes by Dept

```
**Used by qryProcessesByDept to select processes based on the combo box on the form**
SELECT *
```

```
FROM Processes
WHERE Department LIKE  Forms![qryProcessesByDept]!Combo0;
```

Specific Processes by Source

```
**Used by qryProcessesBySource to selectsources based on the combo box on the form**
SELECT ProcessName, DataSource, Department, InformationProduced, TimeToComplete, Frequency,
ReceiversBusArea, EnvisionSelfService, AdditionalSpecifications, PainPointsComments
FROM Processes, DataSummary
WHERE Processes.ProcessName = DataSummary.Process AND
        DataSource LIKE Forms![qryProcessesBySource]!Combo0;
```

Specific Data Summaries

```
**Used by qryProcessSummaries to select processes based on the combo box on the form**
SELECT Process, DataSource, Purpose, DataDestination, Comments
FROM DataSummary
WHERE Process Like Forms![qryProcessSummaries]!Combo0;
```

Processes Using HG

```
**Used to produce the report with Processes that use home grown sources**
SELECT DataSummary.Process, Department, InformationProduced, TimeToComplete, Frequency,
PainPointsComments, DataSource, Purpose, DataDestination, DataSummary.Comments, [Count HG
Sources Used].SourcesUsed
FROM DataSummary, Processes, [Count HG Sources Used]
WHERE DataSummary.Process = Processes.ProcessName
AND DataSummary.Process = [Count HG Sources Used].Process
AND DataSource IN (SELECT HomeGrownName FROM HomeGrownSources);
```

Processes Using CS

```
** Used to produce the report with Processes that use company sources**
SELECT DataSummary.Process, Department, InformationProduced, TimeToComplete, Frequency,
PainPointsComments, DataSource, Purpose, DataDestination, DataSummary.Comments, [Count CS
Sources Used].SourcesUsed
FROM DataSummary, Processes, [Count CS Sources Used]
WHERE DataSummary.Process = Processes.ProcessName
AND DataSummary.Process = [Count CS Sources Used].Process
AND DataSource IN (SELECT SourceName FROM CompanySources);
```

Select Source based on Process

```
**Used by the Data Summary form to populate the source combo box based on the process combo box**
SELECT DataSource
FROM DataSummary
WHERE Process Like Forms!frmDataSummary!combo_process;
```

Combine Sources

Combines all sources in the database for use in the data summary form (Data Source combo box)
SELECT SourceName
FROM CompanySources
UNION
SELECT HomeGrownName
FROM HomeGrownSources;

All Processes by Source

Used to create report of all sources and the processes that use each of them
SELECT DataSource, ProcessName, InformationProduced, TimeToComplete, Frequency, ReceiversBusArea, EnvisionSelfService, AdditionalSpecifications, PainPointsComments
FROM DataSummary, Processes
WHERE DataSummary.Process = Processes.ProcessName;

Count CS Sources Used

Used in 'Processes using CS' query to make the count an attribute rather than an aggregate function
SELECT Process, count(*) AS SourcesUsed
FROM DataSummary
WHERE DataSource IN (SELECT SourceName FROM CompanySources)
GROUP BY Process;

Count HG Sources Used

Used in 'Processes using HG' query to make the count an attribute rather than an aggregate function
SELECT Process, count(*) AS SourcesUsed
FROM DataSummary
WHERE DataSource IN (SELECT HomeGrownName FROM HomeGrownSources)
GROUP BY Process;

Count FR in Processes

Used in 'Final Reports as Sources' query to make the count an attribute rather than an aggregate function.
SELECT DataSource, Count(*) AS NumProcesses
FROM DataSummary
WHERE DataSource IN (SELECT HomeGrownName FROM HomeGrownSources WHERE FinalReport = TRUE)
GROUP BY DataSource;

Purposes for Sources

Used to generate a report that shows the data source, the overall purposes used, and which processes are using the sources for those purposes
SELECT DISTINCT DataSource, Purpose.Value, Process
FROM DataSummary;

Appendix G - Test Plans

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ Passed

Test ID: ___1_

Objective:

Test if all buttons on Main Switchboard work

Interface ID	Data Field	Value Entered
1) 0	View/ Add/ Edit Process Information	Click on the button
2) 0	View/ Add/ Edit Data Sources	Click on the button
3) 0	View/ Add/ Edit a Data Summary	Click on the button
4) 0	Search and Report process documentation	Click on the button
5) 0	Need Help?	Click on the button

Expected Results/Notes

When click on the button, it opens a new page with the related information.

Actual Results/Notes

All buttons work; open the related page.

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ Passed

Test ID: ___2_

Objective:

Test if all buttons work on View/Add/Edit Process Information

Interface ID	Data Field	Value Entered
1) 3	Select Process	Search from dropdown menu
2) 3	View Data Summary	Click on the button
3) 3	View certain data summary	Search from dropdown menu
4) 3	View Data Summary button	Click on the button
5) 3	View All Data Summaries	Click on the button
6) 3	Back to Reports Page from View All Data Summaries	Click on the button

Expected Results/Notes

When click on the button, it opens a new page with the related information. And all the dropdown menus show all the information stored in the database

Actual Results/Notes

All buttons work; Dropdown Menu s show the stored data.

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ X

Test ID: ___3_

Objective:

Test if all buttons work on View/Add/Edit Process Information

Interface ID	Data Field	Value Entered
1) 3	**Add New Process-Process Name**	**Null**
2) 3	**Add New Process-Process Name**	**Test1**
3)	Add New Process- Process Name	Test4
4) 3	Add New Process - Department	Test1
5) 3	Add New Process - Department	Dropdown Menu not showing new input Department
6) 3	Add New Process-Frequency	Dropdown Menu not showing new input Frequency
7) 3	**Select Process**	**Select the process just create without closing the form**
8)	Select Process	Test2
9) 3	Select Process	Select the process just create without closing the form
10) 3	Add New Process-Process Name	Test4
11) 3	Add New Process-Department	Test2
12) 3	Delete Process	Click Delete Process button
13) 3	Save Process	Click Save Process
14) 3	Reset Changes	Click on Reset changes
15) 3	Go Back/ Exit	Click on Go back/Exit

Expected Results/Notes

When click on the button, it opens a new page with the related information. All the dropdown menus show all the information stored in the database. When

Actual Results/Notes

1. When input value is Null or existing process, doesn't pop up message box say can't put process without name or process already exist.
2. When delete in the process, it shows as deleted, rather than clear the row.

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ Passed

Test ID: __4_

Objective:

Test if all buttons on View/Add/Edit Data Sources

Interface ID	Data Field	Value Entered
1) 1	View/ Add/ Edit Data Sources	Click on the button
2) 1	Process Documentation Repository	Click on the Company Button
3) 1	Process Documentation Repository-Company	Source Name- Null
4) 1	Process Documentation Repository-Company	Source Name – Source3
5) 1	Process Documentation	Source Name-Source 10
6) 1	Process Documentation-company-Add New Source	Click on Add New Source button
7) 1	Process Documentation – company-Delete Source	Click on Delete Source
8) 1	Process Documentation – company-Save Source	Click on Save Source
9) 1	Process Documentation –company- Reset Source	Click on Reset Source
10) 1	Process Documentation – company-Go Back/ Exit	Click on Go back/Exit Button
11) 1	Process Documentation Repository-Home Grown	Source Name- Null
12) 1	Process Documentation Repository-Home Grown	Source Name – Source3
13) 1	Process Documentation	Source Name-Source 10
14) 1	Process Documentation-company-Home Grown	Click on Add New Source button
15) 1	Process Documentation – company-Home Grown	Click on Delete Source
16) 1	Process Documentation – Home Grown-Save Source	Click on Save Source
17)	Process Documentation –Home Grown- Reset Source	Click on Reset Source
18)	Process Documentation – Home Grown-Go Back/ Exit	Click on Go back/Exit Button

Expected Results/Notes

When click on the button, it opens a new page with the related information. It has the functionally to save the new Data Source, add the new source, Delete source and Reset source.

Actual Results/Notes

When click on the button, it opens a new page with the related information. It has the functionally to save the new Data Source, add the new source, Delete source and Reset source. When input exist data source or null name data source, it pops out the message box.

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ Passed

Test ID: __5_

Objective:

Test if all buttons on View/Add/Edit Data Sources

Interface ID	Data Field	Value Entered
1) 2	View/ Add/ Edit Data Summary	Click on the button
2) 2	Process Dropdown menu	Click on the process button
3) 2	Source Dropdown Menu	Click on the source menu
4) 2	Add a Process button	Click on Add a Process button
5) 2	Add s Source Button	Click on Add a Source button
6) 2	View Previous Line	Click on View Previous Line button
7) 2	View Next Line	Click on View Next Line button
8) 2	Add New Summary Line	Click on Add New summary Line
9) 2	Delete Summary Line	Click on Delete Summary Line
10) 2	Save Summary Line	Click on Save Summary Line
11) 2	Reset Summary Line	Click on Reset Summary Line
12) 2	Go Back/ Exit	Click on Reset Go Back/Exit button

Expected Results/Notes

All the button work, dropdown menus show all the data stored in the database. When click on Add a Process or Add a Source button, they all link to the new forms to create process and data source. When click on the button, it opens a new page with the related information. It has the functionally to save the new Data Source, add the new source, Delete source and Reset source.

Actual Results/Notes

All the button work, dropdown menus show all the data stored in the database. When click on Add a Process or Add a Source button, they all link to the new forms to create process and data source. When click on the button, it opens a new page with the related information. It has the functionally to save the new Data Source, add the new source, Delete source and Reset source. The View Previous Line and View Next Line buttons doesn't order the process and the data source for the new saved data summary. But it doesn't affect system performance.

Test Plan

Program ID: __1_ Version Number: __1_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ Passed

Test ID: __6_

Objective:

Test if all buttons work on the Search and Report Documentation

Interface ID	Data Field	Value Entered
1) 4	Data Summaries	Click on the button
2) 4	Dropdown menu for data summaries	Select Test4 from dropdown menu
3) 2	View menu	Click on the button
4) 2	View all data summaries	Click on the button
5) 2	Processes by Source	Click on the button
6) 2	Dropdown menu for data source	Select Source 3
7) 2	View menu	Click the button
8) 2	View All sources	Click on the button
9) 2	Process by Department	Click on the button
10)	Dropdown menu for department	Select CL Actuarial
11) 2	View menu	Click on the button
12) 2	View all Department	Click on the button
13) 2	Reset Summary Line	Click on Reset Summary Line
14) 2	Processes Using Home Grown Source	Click on the button
15) 2	Filter by # of Sources	Select 2 from the dropdown menu
16) 2	Filter by # of Sources	Select 3 from dropdown menu
17) 2	Remove Filter	Click on Remove Filter button
18) 2	Processes Using Company Source	Click on the button
19) 2	Filter by # of Sources	Select 1 from the dropdown menu
20) 2	Filter by # of Sources	Select 3 from dropdown menu
21) 2	Remove Filter	Click on Remove Filter button
22) 2	Final reports used as sources	Click on the button
23) 2	Filter by # of Sources	Select 1 from the dropdown menu
24) 2	Filter by # of Sources	Select 3 from dropdown menu
25) 2	Remove Filter	Click on Remove Filter button

26) 2	Purpose for sources	Click on the button
27) 2	All using company sources	Click on the Company button
28) 2	All using Home Grown Sources	Click on the Home Grown button
29) 2	All sources including company and home grown	Click on View All

Expected Results/Notes

All the button work, dropdown menus show all the data stored in the database.

The dropdown shows the new saved data summary.

Actual Results/Notes

All the button work, dropdown menus show all the data stored in the database.

The dropdown shows the new saved data summary.

Test Plan

Program ID: __1_ Version Number: __2_

Tester: _Wenxuan Guo__ Date Designed: _12/07/2011__ Date Conducted: __12/07/2011__

Results: ___ passed

Test ID: ___7_

Objective:

Test if all buttons work on View/Add/Edit Process Information

Interface ID	Data Field	Value Entered
16) 3	Add New Process-Process Name	Null
17) 3	Add New Process-Process Name	Test1
18)	Add New Process- Process Name	Test4
19) 3	Add New Process - Department	Test1
20) 3	Add New Process - Department	Dropdown Menu not showing new input Department
21) 3	Add New Process-Frequency	Dropdown Menu not showing new input Frequency
22) 3	Select Process	Select the process just create without closing the form
23)	Select Process	Test2
24) 3	Select Process	Select the process just create without closing the form
25) 3	Add New Process-Process Name	Test4
26) 3	Add New Process-Department	Test2
27) 3	Delete Process	Click Delete Process button
28) 3	Save Process	Click Save Process
29) 3	Reset Changes	Click on Reset changes
30) 3	Go Back/ Exit	Click on Go back/Exit

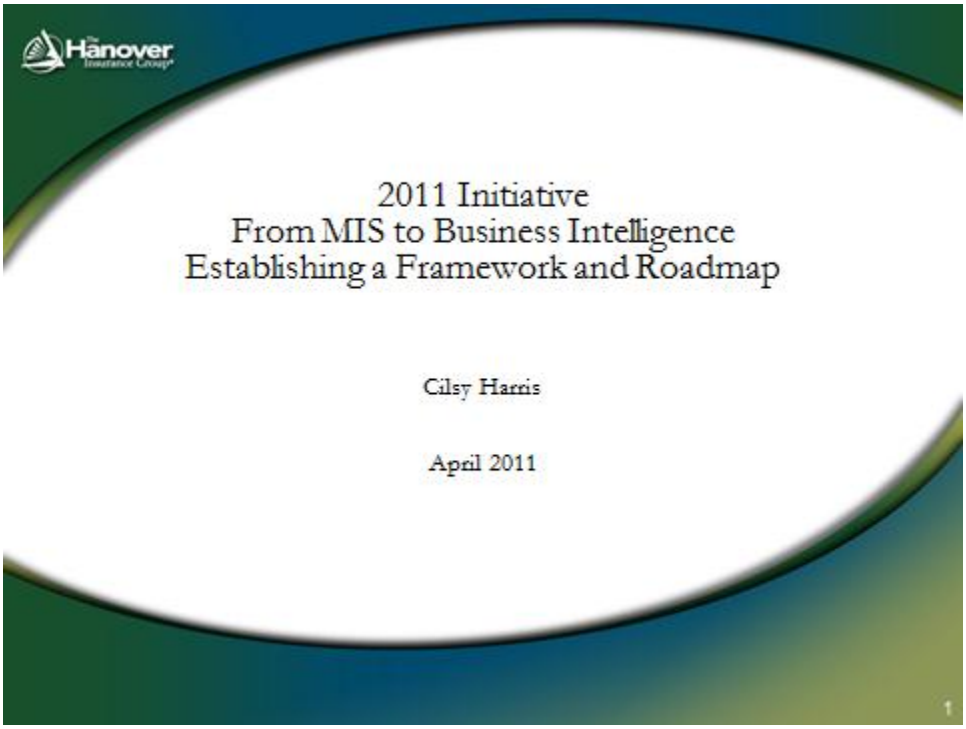
Expected Results/Notes

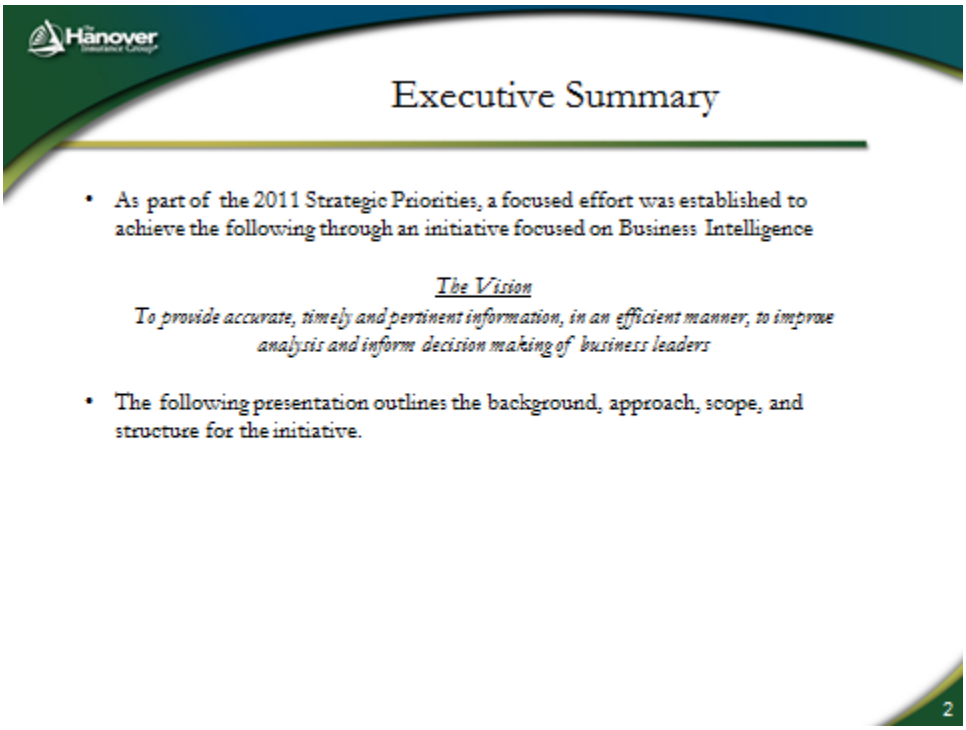
When click on the button, it opens a new page with the related information. All the dropdown menus show all the information stored in the database.

Actual Results/Notes

When click on the button, it opens a new page with the related information. All the dropdown menus show all the information stored in the database.

Appendix H – Business Intelligence Initiative Background





Initiative
2011 Outcomes

- Create Enterprise Alignment and Clarity - establish organizational oversight, ownership, and execution
- Institutionalize a collaborative, cross-functional Business Intelligence Community
- Identify High Impact, Value-Added investments that clearly align and support business priorities.
- Identify and quantify current business opportunities that have clear efficiency payback.

Current State

The Reality:

•Hanover has no shortage of data or information but, we do have some gaps and opportunities

•The data access is difficult, cumbersome, and skill intensive to access

•Historically, the data has been delivered in piece meal efforts over the years serving the focus of that time – finance, product, pricing etc.

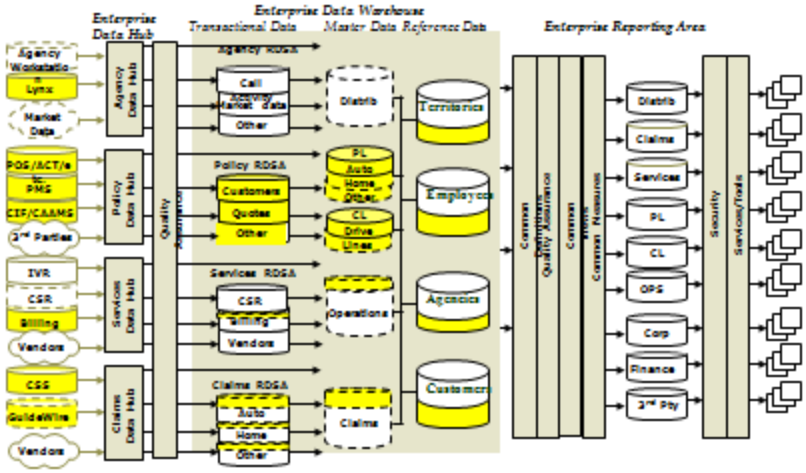
•The vision, while 40% complete, needs redirection to facilitate the extraction, aggregation, and organization of data for business consumption

The Implication:

- Diminished Trust in Hanover's Data and Information Accuracy and Quality
- Inconsistent Understanding of the Scope of Data and Information On Hand
- Diminished Confidence in the delivery of BI solutions in a Timely Manner
- Inconsistent Governance and Ownership Over Our Data Assets
- Diminished Preparation for Growth of Our Data Assets
- Reconciliation of Data is Time-intensive and Detracts from time to Analyze
- Numerous "MIS" Initiatives in Recent Years have caused Confusion and Frustration re: Priorities and Progress

Warehouse Landscape

The yellow shaded areas below represent what has been completed to date.
We are 40% complete against the original planned build-out of the EDW.



Enterprise Alignment and Cross-Functional Business Intelligence Community

ELT Sponsor – David Greenfield

Executive Steering Committee
Joe Freitas, Mike Clifton, Jim Merz

Initiative Leader
Cilsy Harris

Business Intelligence Stakeholder Group
David Greenfield, Mark Dorenbos, Joe Freitas, Mike Clifton, Jim Merz, Dan Halsey, Pam Lawrence

Business Intelligence Working Group
Cilsy Harris, Lisa Voellings, Cathy Estes, Kathy Cunningham, Eric Naglieri, Aaron Bender, Kim Killeen, Pam Hardina, John Rossi, Jeremy Jump, Rob LaChance

Program Management Support
Lisa Voellings

Through the initiative each of the above groups will have a defined purpose, directive, and role in achieving the goals of Business Intelligence

Roles and Expectations

- **ELT Sponsor –** Represents the Business Intelligence Vision and Initiative with and for Hanover's ELT.
- **Executive Steering Committee–** Set the vision and define initiative goals in alignment with the organization goals. This sponsorship group will ensure that the concerns and opportunities for the enterprise remain at the forefront. The purpose of the Steering Committee is to provide senior management involvement and commitment, including overall guidance and direction for the initiative. This Committee should assist in conflict resolution and decision making regarding scope and strategic direction.
- **BI Stakeholder Group -** The group should engage with the Initiative Leadership to provide assistance with the execution of the initiative throughout the organization. They will help insure organizational support, resources and the assurance of execution from within their departments. Their insights and direction will contribute to decisions brought forward to the Steering Committee.
- **BI Working Group –** Cross organizational team whose purpose is to understand the current BI challenges and constraints and to identify opportunities for incremental BI investments which demonstrate clear and meaningful return. The Group will be responsible for making the day-to-day decisions. It is expected that this team will establish working plans and make commitments to achieve the overall goal. Constructive, active participation is required and will be essential for inclusion in the group.
- **BI Initiative Leader –** Provides leadership and oversight to the working group and represents the Working Group plans, progress, and recommendations to the Steering Committee. The Initiative Leader establishes the Initiative approach and plan. In working closely with the Program Manager, creates structure and organization for the Initiative. The Leader ensures collaboration and execution through the Working Group and oversees the membership of the Group to that end.
- **BI Program Manager –** Establishes structured approach for the Working Group. Creates plans, templates, and communication methods for the team. Working closely with the Group's membership ensures clear ownership of tasks and deliverables and tracks progress. Produces regular updates on progress.

Two Simultaneous Paths

The initiative will execute along two simultaneous paths seeking both High Impact outcomes and opportunities to improve the day-to-day of our personnel. Each of these deliverables will be addressed consistent to the overall BI strategy while delivering the targeted outcomes.

- High Impact - Initiate near-term, "wins" for momentum and value.
  - Agency Management/Profile Information – actively quantifying
  - Segment Profit & Loss Statements
  - Portfolio Mix
  - One Beacon Conversion
- Greater Efficiency - Evaluate current business processes for prospective projects based on severity and opportunity.
  - Create a unified scoring method for severity
  - Create a enterprise-wide repository of quantified BI challenges and prospects
  - Create clear candidates for delivery with documented business value

Business Process Inventory and Scoring

- A standard method of collection will be employed to develop an inventory of key business processes and their operational impact.
- Scored processes will be evaluated for opportunity based on benefit, risk, alignment to Business Intelligence Strategy

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