



Project Number:

ALLMERICA PROJECT REPORTING IMPROVEMENTS

A Major Qualifying Project Report

submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfillment of the requirements for the

Degree of Bachelor of Science

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1. project management
2. reporting
3. information systems

Date: March 2, 2005

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Abstract

Our work focused on the enhancement of the project reporting process at Allmerica Financial. We worked closely with Allmerica employees through the system development lifecycle to provide newly-automated reports, as well as a project management web portal which facilitates the entry of report information into a structured database. We have created a system which has the potential to improve upon additional business processes and have therefore made recommendations for further technical and operational improvements at the company.

Acknowledgements

We would like to thank first and foremost our advisor Professor Volkoff, and liaisons Rhett Gibbs and Kathy Massad, for their guidance and assistance throughout the course of the project. We would also like to give special thanks to Chris Sullivan and Steve Skutel for their technical assistance and guidance in the development of our final system.

We would also like to express our gratitude to the ATS and BASD project managers at Allmerica who gave continual feedback on our progress as well as help with other aspects of our project.

Authorship

Kyle Del Bonis was responsible for the VBA logic and programming of the Combined Weekly Status and Monthly Dashboard report, including the integration of functionality provided by the Test Director team. His primary writing contributions include background on project management knowledge areas and the capability maturity model, feasibility analysis of the project, documentation of Allmerica Project Reporting Sources, results for the workbook, systems administration and user manuals for the workbook, and recommendations for the workbook and PM portal, and contributions to the conclusion.

Boris Masis was responsible for the user interface design components on the new Project Reporting System. He re-designed the user interface of both the workbook and the project management portal. His work on the workbook also included some VBA coding and testing. Boris likewise contributed the client-side JavaScript code for the PM Portal site. Boris' writing contributions include the review of related software sections, and parts of the proposed system, results, and system administration documentation.

Susan Moussalli contributed to both the design and coding for the JSP Pages of the project management web portal. In addition, she worked with the team and Allmerica employees to gather functional requirements and conduct user testing on the Project Reporting System. Her writing contributions included the PM Portal User Manual, Testing scripts, Testing results, as well as parts of the background, functional and nonfunctional requirements, use cases, methodology and results.

Adam Ribaldo was responsible for the java programming of the project manager web portal. He was also the primary contact with the Allmerica database administrators who were helpful when trying to interpret the information held in Allmerica's databases. His writing contributions include the PM Portal system administration documentation, the PM Portal results section, the introduction, as well as parts of the background, methodology, and conclusions chapters.

Executive Summary

Through interviews with Allmerica Project Managers, review of ATS and BASD processes and templates, and meetings with Project Management Office employees, we have identified a business problem within Allmerica's project management reporting procedures: the creation of project reports is unnecessarily time intensive and requires accessing information from inconsistently designed data sources.

Within this business problem, we created a scope that defined what areas could be addressed with a technology solution that could be developed within our project's constraints. Our solution was broken up into two parallel sub-projects which were designed to offer different functionalities.

The first sub-project connected Excel report templates to two existing data sources, the ATS Data Repository database and the Test Director database. These connections allow for the pre-population of Investment Proposal (IP), project, defect, budget, and schedule information. The goal of this sub-project was to reduce the time intensive nature of preparing weekly status and monthly dashboard reports by automatically pre-populating them with data that has already been entered once into either Niku Workbench or Test Director Software.

The second sub-project utilized a web interface and new data tables to store information currently held in the ATS and BASD "PRAM" Excel log, and "Acceptance" Excel log. The goal of phase two was to replace these Excel logs with tables in the ATS Data Repository. This step helped ensure data integrity as well as allowed for the further pre-populating of weekly status and monthly dashboard reports.

User testing following the completion of these sub-projects showed that the updated and technology-enhanced reporting process brought significant value to Allmerica Financial.

Specifically, the solution is expected to aid Allmerica Project Managers and the Project Management Office by reducing the time necessary to complete reports and providing a centralized data entry point for project management information. If our system saves each Project Manager 10 minutes per report with 100 ongoing projects across both ATS and BASD, 1100 hours will be saved per year.

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1. Introduction

In today's business world, it is the organizations that understand the importance of change that survive, while less agile companies are left behind. Regardless of the size of a company, operational changes take place through the execution of projects. The larger the company, the more complex its projects tend to become. High levels of project complexity create a need for well defined processes that detail how a project is to be managed.

The Allmerica Technology Services (ATS) division has made Allmerica Financial stand out from other insurance firms through its devotion to best practice project management and its innovative approaches to technical solutions. This is exemplified by the existence of its Enterprise Excellence group which saw to ATS's Capability Maturity Model (CMM) Level Three certification in the fourth quarter of 2003 (Ellsworth, McGee, Ross, & Shaikh, 2004). ATS also possesses a unique architecture which allows project suggestions to formulate on the IT side, making it unnecessary to wait for business needs to emerge before a solution is available (O'Donnell, 2003-A). It is this autonomy which has inspired the motto, "fueling Allmerica's competitive advantage through technology".

Assisting ATS in its endeavor to supply critical IT software development solutions is Allmerica's Business Automation Strategy and Delivery division (BASD). This team of IT-centric Business Analysts works on projects jointly with ATS, procuring project requirements and assisting in Quality Assurance (QA) and testing. BASD serves as a link between Allmerica's business needs and the technical design and implementation of a project. Project ideas formulated on the business side are handed to BASD for analysis and translation into technical requirements that are in turn used by ATS when creating an IT solution. Both BASD and ATS track the project during the course of its life and generate a

number of weekly and monthly status reports. Following the implementation phase BASD performs product QA in preparation for final deployment.

It is the opinion of Allmerica's Program Management Office (PMO) that Project Managers from both ATS and BASD are utilizing unnecessarily time-intensive status reporting procedures that leave them over-worked and under-informed. Additionally, processes common to both ATS and BASD are reported on in different manners depending on a particular division's policies.

Our MQP sought to address these problems by analyzing the workflow of projects managed by both BASD and ATS, streamlining problem processes through the manipulation and creation of project reporting tools, and recommending procedural changes necessary for the efficient management of future projects. Our analysis was completed through interviews with some of ATS and BASD's 70 Project Managers as well as a review of industry literature and best practices. Our work has served as part of a larger initiative to blur the boundaries between the business, BASD, and ATS divisions while providing them with a means for a more flexible and seamless exchange of information.

2. Background

2.1 Allmerica Financial

Incorporated in 1995, Allmerica Financial is composed of a group of financial service companies that market two different types of products and services: asset accumulation management, and property and casualty risk management. Allmerica's Opus Investment Management Inc. is in charge of the asset management division, offering various investment management services to pension funds, institutions, and other organizations (Annual Report, 2003). Property and casualty products and services are offered through the Hanover Insurance Company and Citizens Insurance Company of America. These companies offer regional personal and commercial insurance lines through independent agents and brokers (Annual Report, 2000).

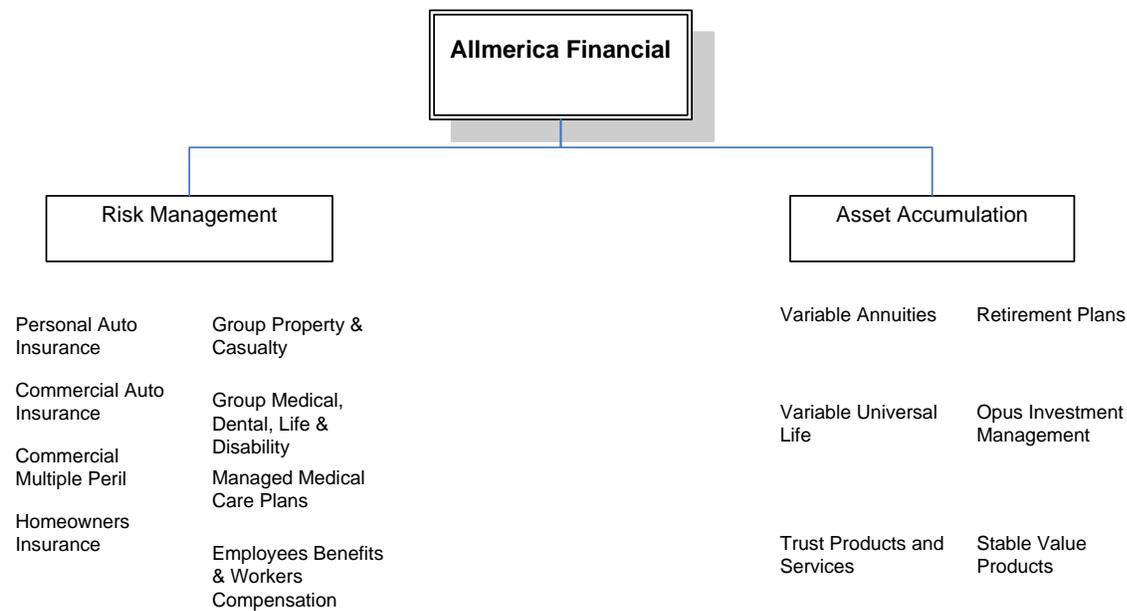
Within the last two years, Allmerica has seen significant changes resulting from financial difficulties faced by the company in 2002. (Louise Eichman, personal communication, 2004). This problem demanded that Allmerica reduce the size of its assets division, prompting a decision to cease the manufacture and sale of new life insurance and annuity products. (Annual Report, 2002).

Following the resignation of the CEO in October of 2002, and the appointment of Frederick H. Eppinger as CEO in August of 2003, Allmerica has seen a great improvement in the handling of company resources. The new company focus is on the property and casualty market where it is now experiencing revenue growth. Allmerica's financial strength rating was restored from "Good" to "Excellent" in January of 2003 by Best Company (Annual Report, 2003).

2.1.1 Organization

Allmerica Financial markets products and services that enable their clients to accumulate assets and manage risks. The company's two main lines of business, asset accumulation and risk management, are shown in Figure 2.1 along with business ventures specific to each division.

Figure 2-1 Allmerica Organizational Structure



Source: About Allmerica, 2004

2.1.1.1 Risk Management

The risk management business is handled by The Hanover Insurance Company and Citizens Insurance Company of America, Allmerica Financial's property and casualty insurance subsidiaries. These two companies underwrite and market property and casualty coverage for both personal and business use. This includes personal and commercial auto

insurance, homeowners insurance, commercial multiple peril, and employee and workers benefits and compensation. Licensed in all 50 states, Hanover Insurance has a particularly strong presence in the Northeast. Citizens Insurance on the other hand, through independent agents, is the largest writer of property and casualty insurance in Michigan and neighboring states (About Allmerica, 2004).

2.1.1.2 Asset Accumulation

Allmerica's Asset Accumulation business is comprised of Allmerica Financial Services and Allmerica Asset Management. Through the subsidiaries that comprise Allmerica Financial Services, clients are able to accumulate assets with help from the organizations wide range of insurance and investment products. All products are available through career agents, independent broker dealers, financial institutions and investment management companies. This includes variable insurance products and both qualified and non-qualified retirement plans. (Allmerica Financial Enterprise-Wide Technology Strategy, 2001)

Larger organizations are managed through Allmerica's subsidiary, Opus Investment Management. This organization plays an important role in provides fixed income money management services to third parties such as insurance companies, pension funds and mutual funds. (Annual Report, 2003).

2.1.2 Information Technology Project Delivery

When any of Allmerica's businesses require an information technology (IT) solution, they turn to the in-house Allmerica Technology Services (ATS) and the Business Automation, Strategy, and Delivery (BASD) divisions.

2.1.2.1 Allmerica Technology Services

Greg Trantor, CIO of Allmerica Technology Services (ATS), describes ATS's vision as "fueling Allmerica's competitive advantage through technology." (O'Donnell, 2003-B) Prior to July 2000, when Trantor was named CIO of the organization, ATS was suffering from a "lack of focus on process and on what IT was doing to benefit the business." (O'Donnell, 2003-B) With the new leadership, however, ATS was restructured into four separate units. The first unit, Service Delivery, which is divided into application and utilities, delivers production support and supports users through the various types of businesses. The second unit, Project delivery, concentrates on managing all project planning and execution. The third unit, Enterprise IT, oversees all architecture, data management and vendor management. Finally, there is the Enterprise Excellence group whose task is creating and fostering best practices for all services delivered to the business. This unit has been the driving force behind ATS becoming Capability Maturity Model (CMM) Level Three certified in late 2003 (O'Donnell, 2003-B). An overview of the Capability Maturity Model is given in Appendix B.

Meanwhile, outsourcing basic maintenance work to third parties has allowed ATS employees to work together to focus on new development initiatives. ATS's chief partner in

this initiative is Keane, Inc. Currently, ATS outsources the support and maintenance of some systems to Keane's Halifax, Nova Scotia, and Indian facilities, resulting in almost a fifty percent reduction in labor costs (O'Donnell, 2003-C).

2.1.2.2 Business Automation Strategy and Delivery

The Business Automation Strategy and Delivery Division at Allmerica Financial, is made up of Business Analysts who are intermediaries between the software architects of ATS and Allmerica's business personnel. In December of 2003, BASD joined ATS under the leadership of Allmerica's CIO, Greg Trantor. Together under a designated program manager, BASD and ATS personnel collaborate to define and develop software solutions for the organization and its customers.

2.2 Project Management

Projects are activities that result in new or modified products, services, or processes, and are critical to the success of any organization. Built around a defined set of objectives which can differ in size from small and simple to large and complex, projects can increase sales, improve customer satisfaction, reduce costs, improve the work environment, and result in other benefits. Projects are temporary activities with specific starting and completion dates. Thus an ongoing function such as running a sales department cannot be considered a project. On the other hand, improving reporting within the marketing division is a specific task which can be classified as a project.

Project management is considered by the American Society for Quality as “the application of knowledge, skills, tools and techniques to a broad range of activities to meet the requirements of [a] particular project” (2004). The project management process involves controlling time, costs, risk, scope, and overall quality in order to improve the probability of project success as well as meeting the established objectives on time and on budget. The project management discipline has become a focal point of improvement efforts within many organizations as the recognition of its value increases. Project management offices, training centers and organization change programs are becoming common parts of corporate plans to improve on the project management process and organizational effectiveness (International Institute for Learning, 2004).

The Project Management Institute (PMI) defines five major process groups used within projects: initiation, planning, execution, controlling, and closing (Perkins, Peterson, Smith, 2003). These processes are sequences of activities that are meant to accomplish specific functions that are necessary for the overall completion of a project. The initiation process involves formally validating and authorizing the project at hand. A feasibility study is often included as is a preliminary requirements study, followed by a preliminary plan or a concept of operations. The planning process aims at establishing the scope and boundaries of the project, and defines the expectation baseline. On a more detailed level, the planning process includes activities such as determining task durations, estimating a schedule, conducting risk management and communications and staff planning, looking at resource planning, estimating costs, and developing a project plan. The executing process involves actions that direct or otherwise enable the actual work to be done. The project plan is executed, quality assurance is performed, procurement activities take place, and

communication between team members and project stakeholders occurs. The controlling processes are typically ongoing throughout the length of the project. Controlling processes include verifying that the project is proceeding according to plan, and determining any deviations. In addition, this process looks at monitoring, measuring, and reporting on project activities, as well as maintaining or controlling scope. Finally, the closing process aims to resolve any open issues, complete final paperwork, as well as gather relevant information for evaluating project performance. Together these activities include the contract closeout and the administrative closure.

Overall project success is typically measured by the meeting of cost, schedule, and quality objectives within scope while also addressing the expectations of customers. (Perkins, Peterson, Smith, 2003) The process of reaching these goals is a challenging one, and requires a skilled Project Manager to be mindful of following best practices while being agile enough to accommodate naturally occurring changes.

2.2.1 PMI Project Management Knowledge Areas

The five process groups discussed previously are central to the management of any given project. The Project Management Institute also describes a number of additional knowledge areas in its book, “A Guide to the Project Management Body of Knowledge” which has heavily influenced the procedures created by Allmerica’s project management office. The nine knowledge areas described in the section below need to be considered and applied when working through the five phases. Table 2.1 displays the relationship between the phases and the knowledge areas including which project processes intersect both.

Table 2-1 PMI Project Management Knowledge Areas

Knowledge Areas \ Process Groups	Initiating	Planning	Executing	Controlling	Closing
1.) Project Integration Management		1.1 Project Plan Development	1.2 Project Plan Execution	1.3 Integrated Change Control	
2.) Project Scope Management	2.1 Initiation	2.2 Scope Planning 2.3 Scope Definition		2.4 Scope Verification 2.5 Scope Change Control	
3.) Project Time Management		3.1 Activity Definition 3.2 Activity Sequencing 3.3 Activity Duration Estimation 3.4 Schedule Development		3.5 Schedule Control	
4.) Project Cost Management		4.1 Resource Planning 4.2 Cost Estimating 4.3 Cost Budgeting		4.4 Cost Control	
5.) Project Quality Management		5.1 Quality Planning	5.2 Quality Assurance	5.3 Quality Control	
6.) Project Human Resource Management		6.1 Organizational Planning 6.2 Staff Acquisition	6.3 Team Development		
7.) Project Communications Management		7.1 Communications Planning	7.2 Information Distribution	10.3 Performance Reporting	10.4 Administrative Closure
8.) Project Risk Management		8.1 Risk Management Planning 8.2 Risk Identification 8.3 Qualitative Risk Analysis 8.4 Quantitative Risk Analysis 8.5 Risk Resource Planning		8.6 Risk Monitoring and Control	
9.) Project Procurement Management		9.1 Procurement Planning 9.2 Solicitation Planning	9.3 Solicitation Selection 9.5 Contract Administration		9.6 Contract Closeout

Source: Project Management Institute, 2000

2.2.1.1 Project Integration Management

Project Integration Management consists of a variety of processes dedicated to ensuring that all elements of the project are properly coordinated. It also contains strategies for identifying and executing tradeoffs among competing objectives and alternatives in order to satisfy or exceed the goals and demands of the project. Project Integration Management is broken up into three major processes: Project Plan Development, Project Plan Execution and Integrated Change Control.

Project plan development is the concept of creating one comprehensive document from all other planning processes in an attempt to provide a guide to project execution and control. By utilizing inputs such as historical information, organizational policies, constraints, and assumptions from other processes, an intuitive and distinct project plan with relevant supporting details can be output and referenced as a project outline.

Project plan execution is the main process responsible for executing the project plan, and usually accounts for most of the project budget. To effectively employ the project plan, a project plan execution process should involve such elements as a work authorization system, a project management information system and status review meetings. As a result, work output and change requests can be analyzed for continuous improvement of the project plan.

Integrated change control is a set of procedures established to manage the advent and impact of changes to a project as they are encountered. By analyzing inputs from performance reports and change requests as they are delivered from the project plan execution process, tools such as change control systems and configuration management systems are able to produce project plan updates and corrective action to the project plan. Integrated Change Control is also concerned with ensuring that all changes made to the scope

are properly reflected and that all changes are coordinated across all affected knowledge areas (e.g. cost, risk, quality, etc.). Allmerica can benefit from Integrated Change Control, as well as integrated Project Plan Development and Project Plan Execution, since BASD and ATS work together on a majority of their company's discretionary projects but have been using different processes.

2.2.1.2 Project Scope Management

Project Scope Management includes the processes which ensure that the project consists of all the work required, and only the work required, to successfully complete the project. It is primarily concerned with establishing and governing what is or is not part of the project, and includes the following processes: Initiation, Scope Planning, Scope Definition, Scope Verification, and Scope Change Control.

Initiation is the process which formally authorizes a project. In order to receive a green light, a project needs to meet certain credentials such as a market demand, business need, customer request, etc. Utilizing expert judgment and other project selection methods upon the proposed product description and strategic plan produces a project charter, with accompanying constraints and assumptions, which formally authorizes the project.

Scope planning is concerned with continuously elaborating and documenting all project work that is responsible for producing the requirements of the project. This process, guided by the project charter, employs product analysis, benefit/cost analysis, and alternatives identification as a means of producing a scope statement and scope management plan. These products state how to manage project scope, as well as how to make future decisions concerning project scope.

Scope definition provides processes to help subdivide major project deliverables into smaller and more manageable components. By employing one of the many work breakdown structure (WBS) templates available for project management, and applying it to the overall scope statement, a definitive work breakdown structure technique is chosen and applied to the project.

Scope verification processes are simply concerned with gaining acceptance of the project scope by the project stakeholders. After reviewing the tentative WBS and project scope plans, stakeholders decide whether or not to accept the implementation of the project.

Scope change control is concerned with managing and influencing the factors of change in scope. By analyzing performance reports and change request through a scope change control system or other performance measurement tools, scope change control is responsible for allowing scope changes, adjusting the baseline, or administering corrective actions.

One way to facilitate Project Scope Management at Allmerica is to increase the efficiency of scope planning. For example by automating reports and improving information collection, documentation of project plan information will be made easier and more accurate.

2.2.1.3 Project Time Management

Project Time Management contains the following processes needed to ensure timely completion of the project: Activity Definition, Activity Sequencing, Activity Duration Estimating, Schedule Development, and Schedule Control.

Activity definition is the process of identifying and documenting all specific activities which must be performed in order to produce all deliverables and sub-deliverables

acknowledged in the WBS. Using task decomposition techniques, an activity list is created and used as a guideline for required deliverable activities.

Activity Sequencing is responsible for identifying and documenting interactivity dependent relationships, and sequencing them in a manner that supports later development of an achievable schedule. Employing such tools as Precedence Diagramming Models (PDM), Arrow Diagramming Methods (ADM), or Conditional Diagramming Methods (CDM), an activity list can be transformed into a project network diagram: an intuitive and graphical representation of all project tasks in the order they must be completed.

Activity Duration Estimation involves the careful estimation of resources and information needed to complete a process task, and identifying its development duration.

Schedule development is responsible for predicting accurate start and finish dates for all project activities. Through analyzing components such as the network diagram and resource requirements, techniques such as mathematical analysis and critical path method (CPM) are employed in order to produce a realistic project schedule.

Schedule change control is concerned with managing and influencing the factors of change in the schedule. By analyzing performance reports and change request through a schedule change control system or other performance measurement tools, schedule change control is responsible for allowing schedule updates or administering corrective actions (Project Management Institute, 2000).

Any solution that reduces the amount of time project managers spend creating reports will affect project time management over all Allmerica.

2.2.1.4 Project Cost Management

Project Cost Management contains the following processes which are used to ensure that the project is completed within the approved budget: Resource Planning, Cost Estimating, Cost Budgeting, and Cost Control.

Resource planning helps to determine which physical resources need to be allocated to perform certain project activities. It involves a broad analysis of major project components such as the WBS, scope statement, and resource pool description. By use of sophisticated project management software and expert managerial judgment, realistic and financially effective resource requirements are developed.

Cost estimating involves the development of approximate costs of all resources needed for project activities. Through analysis of the resource requirements and WBS, certain cost estimating strategies such as analogous estimating, parametric modeling, and bottom-up estimating, a realistic cost estimate and cost management plan can be produced.

Cost budgeting is responsible for allocating the overall cost estimates to specific project activities. Using information from the cost estimates and WBS, a variety of cost budgeting tools and techniques are used to create a cost baseline which will allow financial performance to be evaluated.

Cost control is concerned with managing the influencing factors that create change to the cost baseline, determining when the cost baseline has changed, and managing these changes. By analyzing performance reports and change requests through use of cost change control systems, performance measurement, or even earned value management, this process can produce revised cost estimates and budget updates.

2.2.1.5 Project Quality Management

The following Project Quality Management processes are concerned with the satisfaction of all needs for which the project was undertaken: Quality planning, quality assurance, and quality control.

Quality planning is meant to identify which standards of quality are relevant to the project, as well as how to satisfy them. Through analysis of the scope statement and company quality policy, tools such as benefit/cost analysis, benchmarking, and flowcharting help for the creation of a quality management plan with operational definitions. This product defines how the project management team will implement its quality policy.

Quality assurance includes the activities which are to ensure that all quality standards relevant to the project are satisfied. Using the quality management plan as a guideline, quality planning tools and techniques such as quality audits are used to provide quality improvement to the project.

Quality control involves analyzing certain project results and deciding whether or not they comply with quality standards, as well as identifying causes and eliminating them. Analyzing work results in conjunction with the quality management plan with quality control tools such as pareto diagrams, flowcharting, trend analysis, etc., quality control can improve quality through process adjustments and rework.

Quality can be improved through increased automation. By automatically retrieving data and placing it where it belongs rather than depending on manual data entry, there is a reduced chance of inputting incorrect data which will produce low-quality reports.

2.2.1.6 Project Human Resources Management

Project Human Resources Management entails the following processes which help to ensure the most effective use of personnel involved with a project: Organizational Planning, Staff Acquisition, and Team Development.

Organizational planning is a process that deals with identifying, documenting and assigning project roles, responsibilities, as well as reporting relationships. By analyzing project characteristics such as project interfaces and staffing requirements, techniques such as human resource practices, organizational theory, and stakeholder analysis, outputs such as role and responsibility assignments, staffing management plans, and organizational charts can be produced.

The staff acquisition process is focused on getting the required human resources assigned to project tasks. This process examines the staffing management plan, as well as recruitment practices, and then employs techniques such as negotiations, pre-assignment, and procurement in order to develop a project staff assignment and team directory.

Team Development processes are geared towards fostering communication and development between stakeholder and project teams, as well as the individuals within the project team itself. By means of a broad analysis of the project plan, project staff, and performance reports, team development methods such as reward systems, team-building, collocation, and training help to result in team performance improvements.

2.2.1.7 Project Communications Management

Project Communications Management consists of the following processes whose intentions are to facilitate proper generation, dissemination, and storage of project information: Communications Planning, Information Distribution, Performance Reporting, and Administrative Closure.

The communications planning process involves determining the communication and information needs of project stakeholders. Through a simple stakeholder analysis, a communications plan is produced which then becomes responsible for the details of information manipulation.

Information distribution is concerned with the process of having needed information available to stakeholders on demand. Through analysis of the communications plan, as well as work results, tools such as information retrieval systems and information distribution methods are utilized in order to produce project records, reports, and presentations.

Performance reporting is intended to keep stakeholder aware of how project resources are being used to achieve project objectives. By mean of status reporting, forecasting, trend analysis, earned value analysis, etc., performance reports are delivered to the stakeholder in order to keep them informed.

Administrative closure consists of documenting all project results in a formal manner in order to receive acceptance of the final product by the sponsor or customer. Utilizing previous project documentations and records, performance reporting tools and techniques are utilized to create project archives which will hopefully result in project closure. Creating standard procedures for collection, dissemination, and storing information will improve information distribution and performance reporting as well as administrative closure.

2.2.1.8 Project Risk Management

Project Risk Management is concerned with the continuous process of recognizing, analyzing, and responding to project risks, as well as maximizing the occurrence of positive events, and minimizing the occurrence of negative ones. The processes of Project Risk Management are as follows: Risk Management Planning, Risk Identification, Qualitative Risk Analysis, Quantitative Risk Analysis, Risk Response Planning, and Risk Monitoring and Control.

Risk management planning is a general process of deciding how to approach risk management activities for a project. It consists of a broad analysis of project constituents, such as the WBS, roles and responsibilities, project charter, and the organizations current risk management policies. Through team meeting, project teams are meant to develop a risk management plan which will serve as a guideline for all future risk management during the project.

Risk identification is concerned only with identifying particular risks and how they may affect the project. Using the risk management plan as a guideline, project teams use information gathering techniques, such as brainstorming, the Delphi technique, interviewing, and SWOT analysis to determine particular risks and triggers to risks.

Qualitative risk analysis is the process of determining the possibility of identified risks. Employing tools such as probability/impact risk rating matrices and techniques such as project assumptions testing, project teams are able to turn out an overall prioritized list of risk ranking for a project.

Quantitative risk analysis aims to numerically analyze the probability of risks, as well as their consequences to project objectives. Utilizing the list of prioritized risks as a guideline, techniques such as interviewing, sensitivity analysis, decision tree analysis, and simulation are used to produce a prioritized list of quantified risks, as well as a problematic analysis of the project.

Risk response planning is responsible for developing options and actions to be executed when a risk occurs. By means of a broad analysis of project constituents such as the risk management plan, trends in qualitative and quantitative risk analysis results, and problematic analysis of the project, techniques such as avoidance, transference, mitigation, and acceptance are employed in order to develop a comprehensive risk response plan, complete with contractual agreements.

Risk monitoring and control is the process of supervising all types of risks: identified, residual, and potential. It is an ongoing process that involves periodic project risk response audits, project risk reviews, earned value analysis. As a result, a variety of outputs, such as workaround plans, corrective action, project plan updates, risk databases, and risk list updates are produced. In general improved project reporting can improve risk management. More specifically, improved tracking of identified risks will be helpful.

2.2.1.9 Project Procurement Management

Project Procurement Management is concerned with the following processes which are involved with acquiring goods and services needed for the project from outside of the operating organization: Procurement Planning, Solicitation Planning, Solicitation, Source Selection, Contract Administration, and Contract Closeout.

Procurement planning details the activity of identifying which specific project needs can be met by procuring goods and services outside of the project organization. Through a general overview of the scope statement, product description, and relevant market conditions, techniques like make-or-buy analysis are employed in order to create a project procurement plan.

The purpose of solicitation planning is to prepare the documents required to perform solicitation. By means of a simple analysis of the project procurement plan, standard contractual forms are utilized to create procurement documents for solicitation.

Solicitation is the process of acquiring bids from potential sellers for project product needs. By providing procurements documents to suppliers of interest, the project team undergoes bidder conferencing, as well as marketing and advertising ventures, in order to obtain seller proposals.

Source selection involves the activity of evaluating the proposals from sellers. By means of contract negotiation, weighting systems, and screening systems, the project team created a contract with their most favored seller.

Contract administration is meant to ensure the quality and performance of the seller in regards to the contractual requirements. Through evaluation of the contract, as well as work results and change requests, the project team works with contract change request systems and performance reporting tools in order to produce contract changes and maintain effective correspondences with the seller.

Contract closeout is comprised of procedures which verify whether or not the seller completed all work correctly, as well as ones that create contract documents for archiving purposes. It consists of performing procurement audits, using the contract documentation as a

guideline, which produce a contract file, as well as formal acceptance and closure of the contract.

The Project Management Institute strongly recommends that attention be paid to the nine aforementioned project management areas of practice. Effective project management is not an easy process for an organization to master, however the application of techniques within these areas, combined with strong leadership and effective software tools are considered to be industry best practices for developing effective project management processes.

2.3 ATS and BASD Projects

Allmerica IT projects fall within one of two different categories: baseline and discretionary. Baseline projects deal with the daily operation of the organization such as changes to insurance rates that are sent out to brokers. These projects are handled between business, BASD, and sub-contracted firms. Discretionary projects, however, involve business, BASD, and ATS, and are focused on making changes to how Allmerica runs as a company. An example of a discretionary project would be one that implements a new file sharing server for departmental use. These projects are allotted resources through their acceptance into an investment proposal.

Investment Proposals (IP's) are funding requests for technology solutions that address organizational problems (Investment Proposals Process – 2005, 2004). The IP process starts with submissions from any area of the company that can identify and justify a need for change. The submissions are then compiled and prioritized by an operating committee that includes the CIO of Allmerica. Approved IP's will obtain funding in the next financial year

that will be used towards the instantiation of multiple projects. This group of projects is called a program and is managed by a Program Manager. The Program Manager collects reports from each project's Project Manager (PM) and prepares reports to the Project Management Office (PMO) that are later delivered to the CIO. A Program Manager's responsibilities also include ensuring that services promised to the customer are delivered, managing program resources, issues, and risks, and supervising communication and coordination among PM's.

Roughly 85% of discretionary projects require cooperation between BASD and ATS. This is because of a difference in core competencies. BASD uses its Business Analysts (BA's) in order to communicate effectively with the business side of Allmerica and gather business requirements that can be translated into functional requirements for a technology solution. BASD also employs a number of Quality Assurance (QA) personnel in order to perform system audits and defect tracking. ATS, on the other hand, focuses its Data Architects exclusively on system design and development. In addition to Business Analysts from BASD, and Software Developers from ATS, each cooperative project is supervised by PM's from both the ATS and BASD groups. Despite the fact that the PM's work on different sets of procedures, they must work together to present one comprehensive solution that meets the needs of the business.

2.3.1 ATS and BASD Project Management Procedures

A diagram of the tasks, artifacts, and flows of combined ATS and BASD projects is provided in Appendix C.

Every new discretionary project begins with a project charter which is created by BASD Project Management and reviewed by ATS Project Management. This charter lists the project ground rules and is presented at a “kick off” meeting which is initiated by BASD and includes all major project stakeholders. The BASD Project Manager is then able to create a Niku project plan based on the project charter in order to facilitate project control. This plan establishes the work break down structure (WBS), baseline hours, and allots general resources and tasks. The number of hours the PM originally assigns each task becomes very important later on when evaluating project progress. By later comparing this “baseline” set of hours against how many hours each task actually took, a PM can effectively map project performance.

Once the project plan is completed, it is the responsibility of the Business Analysts (BA) in BASD to develop and implement a “BA Strategy”. This means gathering detailed user requirements using a variety of techniques so that they can ensure that the resulting system has the proper functionality and is practical for the targeted users. Gathering detailed requirements is an iterative process that involves the BASD personnel prioritizing the requirements to assure that the most critical issues are addressed in the project solution. This requires frequent interaction between a team of Business Analysts from BASD and Software Developers from ATS.

On the ATS end, the development team starts by creating a Statement of Work (SOW), which defines the expectation of the customer, ATS, and BASD (ATS Procedures Manual, 2003). It is the SOW that is referred to whenever an issue, such as project change, emerges. This document and others are stored in the project’s work product repositories. These repositories can take the form of a physical project notebook or a digital project

control book (PCB), also referred to as a Work Product Database (WPDB). Each ATS project and BASD project is assigned a WPDB in both the BASD repository and ATS repository. These WPDB's, which are used to store and organize electronic documents, are not databases in the traditional sense, but rather Novell file shares that can be accessed by anyone within the BASD or ATS department. Documents contained in the WPDB include risk logs, issue logs, change logs, reports, and other relevant files.

Once project initiation has ended, the Business System Analysis Phase is initiated. During this phase, ATS and Business Analysts work closely together to further develop a joint understanding of the work that will be necessary. Both groups assemble detailed user requirements into a "Business Process Model" so that the resulting requirement specification contains enough functional data and performance requirements to guide the system design into the next phase. It is these specifications which will eventually be translated into the technical specifications that will guide ATS architects. The specifications describe what the system does; remaining as free as possible from the physical characteristics of how the system works.

The ATS designee and other involved parties will then assemble a feasibility assessment to present to all required business representatives. It is possible that project management may cut the scope and objectives down to something less ambitious in order to develop a more favorable balance of costs and benefits. In that case, documentation is updated to reflect changes in scope. For this reason, it is important that the project is monitored throughout the entire development life cycle. This is done through project reporting in the form of individual status reports, weekly status reports, and monthly project dashboards. These reports are presented to project stakeholders and summarize varying

amounts of information obtained from a variety of sources depending on the type of report. See section 2.3.2 for a more detailed description on project reporting procedures.

During project reporting, if an issue is reported or can be foreseen, project leadership must follow issue management procedures in order to make better decisions as to where to focus attention. Many times, there is only one issue log for both ATS and BASD, with only one of the managers having the primary responsibility for managing the log. This person is designated as Issue Coordinator, and must assign an issue manager to resolve the issue.

A similar procedure is followed for situations that do not follow the original business specifications. A BASD PM or designee is responsible for identifying the change and filling out a Change Request Form, which must be approved before executing the change.

The next two phases, which are test planning and construction, bring ATS and BASD together for deliverable review. The deliverables include the technical design documentation as well as any changes that have been proposed. The design documentation analyzes how the Functional Specification will be implemented in the production environment. This is crucial in that a good design will eventually reduce the amount of code needed and simplify the next phase, the construction phase, which covers the development and testing of the software specified by the ATS Technical Specification. The software includes the application system as well as code needed for transition and testing. Documentation produced in this phase may include User and Operation Manuals, training materials, and system technical documentation needed for maintenance during the final two phases, testing and implementation.

In addition, peer reviews are conducted to identify defects early in the development life cycle. Peer reviews include a walk-through or inspection of a work product by one or

more knowledgeable people for the purpose of identifying defects or opportunities for improvement before the work product is turned over to the next phase. If completed early enough, these activities can significantly reduce the number of post-production errors.

The Testing phase calls for the BASD Business Analysts to define and execute any necessary quality assurance tests in cooperation with a Quality Assurance (QA) Team. The QA Team will consist of a test coordinator, test architect, test designer, test lead, and test analyst. There are various phases for testing, from integration testing to regression testing to user acceptance testing. User Acceptance Testing is the primary responsibility of the BASD group, however, ATS Project Team Members may need to be involved to run test cycles, parallel and regression tests, and perform other technical support tasks. The BASD team members are responsible for identifying three types of issues when executing test cases. The first type is defects that are attributable to requirements, design, or construction of the system. Defects are then recorded in a defect tracking system. The second type of issue is problems or items that need to be researched to determine if there is a defect, an enhancement, or just an explanation. The last type of issue BASD deals with is enhancements, which are desired changes that were not part of the original specifications. Once the leadership assesses the standardized processes involved in the project, they are able to identify the strengths and weaknesses and adjust the organization process as necessary.

The final phase in the system development life cycle is the implementation phase, during which ATS transfers the new system from the testing environment and installs it into the production environment. As the system goes live, an ATS PM works with the BASD PM to establish dual system executions, as well as dual executions of other related procedures in the case that there are parallel production runs of the old and new systems. Once the parallel

results are signed-off by an authorized BASD representative, the ATS PM oversees the shut down of the old system and the transition to the new system. Once this is complete, a BASD team member can collect project-end metrics and verify that all project documentation is organized in both the online PCB, and the WPDB.

2.3.2 Project Reporting Procedures

Project reporting is carried out throughout the life of all ATS and BASD projects and is crucial to effective project management. These reports are presented to project stakeholders and summarize varying amounts of information obtained from a variety of sources depending on the type of report. Reports common to both ATS and BASD project teams include individual status reports, weekly status reports, and monthly project dashboards.

Individual status reports are Microsoft Word documents completed by each project team member on a day of the week set forth by the project manager during project initiation. The key information provided by this report includes accomplishments this week, planned accomplishments for next week, issues, risks, and lost time. Risks are defined by Allmerica as possible needs for change and issues are defined as realized risks.

Once each individual project team member has submitted an individual status report, their Project Manager is able to complete the weekly project status report. This report, which is a Word document for ATS PM's and takes the form of an Excel spreadsheet for BASD PM's, is delivered to all project stakeholders including the customer, the project's Program Manager, and the Project Management Office. The information held by this report is much more extensive than the individual status reports and is drawn from a variety of sources.

First, a table must be filled out listing each major project milestone against the milestone's baseline start date, actual start date, baseline end date, and actual end date. Most of the information for these tables is pulled manually from the Niku project plan and can be modified if the PM feels additional milestones should be listed. Next, the period's accomplishments, planned activities, and on-going activities must be listed. The sources for this information can be any relevant documents that explain future, past, or on-going accomplishments such as emails, faxes, meeting minutes, and the project plan. The next section details any risks, issues, changes, or deliverable acceptances that have come about in the last week. These come from a separate Excel log file that is located within the project's WPDB. Each log file lists every change, issue, risk, or deliverable acceptance chronologically and is maintained by the Project Manager. BASD Project Managers must fill out one final section on the weekly status report that includes progress on system defects, peer reviews, and QA.

The monthly project dashboard is an Excel file sent by a Project Manager to the Project Management Office for review. The main difference between the ATS and BASD version of this report is the amount of automation it involves. The ATS template uses no automation and must be filled out manually from the PM's source documents. The BASD version however uses the weekly status report sheet within the same Excel file to populate much of the information. Aside from this difference, the data fields required by each report are the same. The first section of the dashboard holds identifying information about the project such as its name, phase, and which IP it falls under. The second section displays a set of colored dashboard indicators that give the reviewer a quick idea of how the project is progressing. The third section lists project milestones mapped to their baseline and actual

starting and ending dates. The next section contains a table of resource hours that map the baseline values against the number actually recorded by project team members. This information will only be accurate if the Project Manager has been actively using the project plan. The next section is a text box that allows the PM's to discuss any risks or issues that have developed. The following section lists information relevant to the testing phase of the project. The number of changes to the project that have been accepted, rejected, deferred, or set to pending are then listed. The last section shows the comparison between forecasted and actual staffing resources. This report, along with its data sources for both BASD and ATS, is shown in Figure 2.1. As shown in Figures 2.1 and 2.2., information for the Weekly Status Report and information for the Monthly Dashboard came from a variety of different data sources, which is what caused the inconsistency in report data.

Figure 2-2 As-Is BASD and ATS Dashboard Reporting Sources

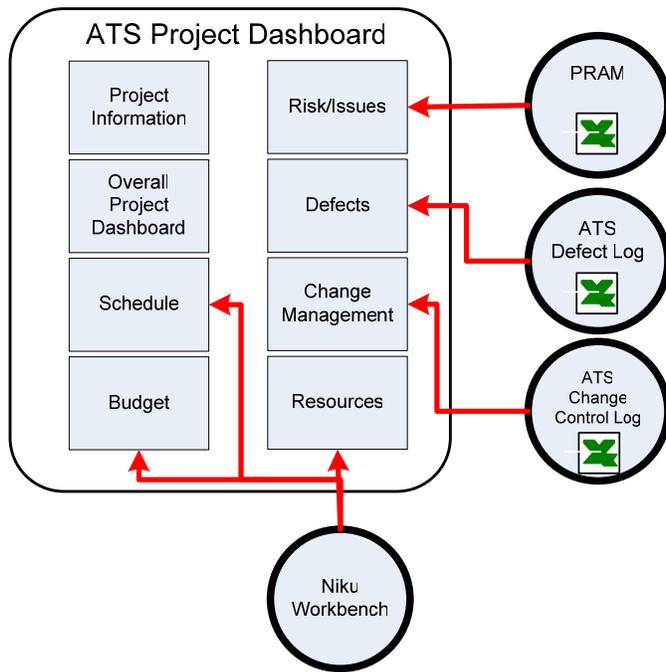
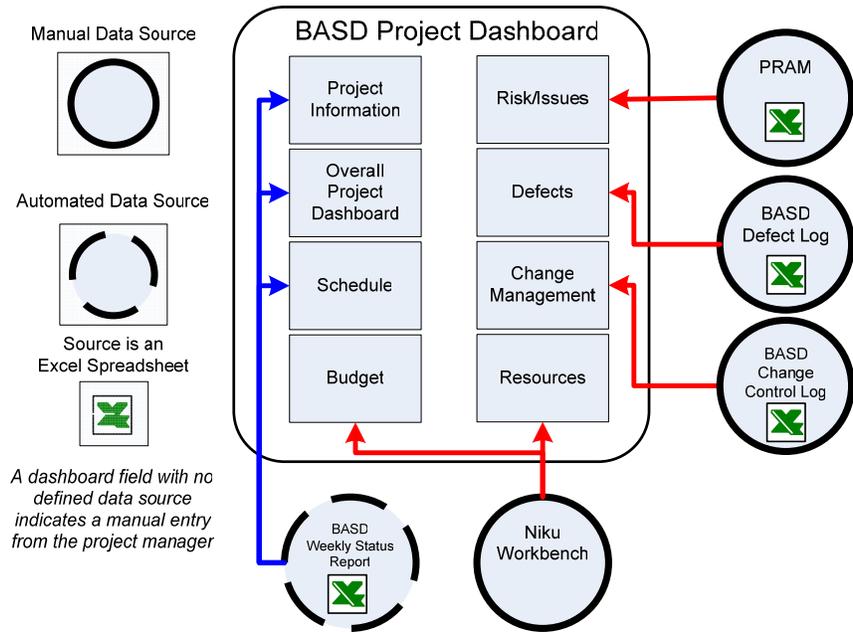
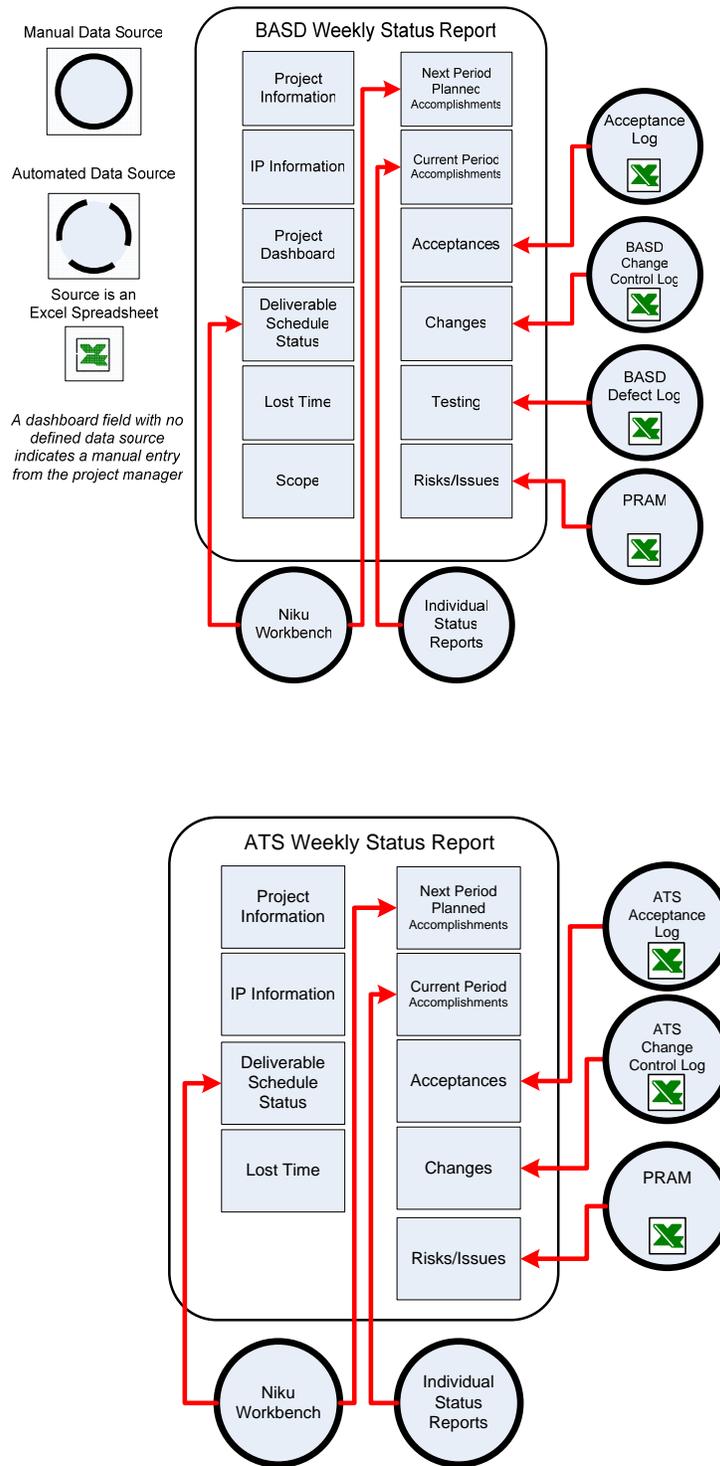


Figure 2-3 As-Is BASD and ATS Weekly Status Reporting Sources



2.4 Review of Related Software used by Allmerica

Allmerica operates a large number of desktop computers running a suite of applications on the Microsoft Windows XP platform. Key software such as Microsoft Office and Novell NetWare are deployed enterprise wide. Oracle has been chosen as the preferred database development platform. A number of different applications contributing to the management of projects are also used within the organization. A review of those directly related to our work can be found below.

2.4.1 Niku Workbench

Niku Workbench is the primary desktop project management software application used at Allmerica Financial. As of July 12, 2004, Niku opened the source code of the application, renaming it to “Open Workbench” and releasing it for free use and modification on the internet. The software is advertised as a free alternative to Microsoft Project, (Open Workbench, 2004) but some analysts report that Workbench is a somewhat different piece of software.

The product is advertised as allowing Project Managers to create sophisticated work breakdown structures (WBS) with tasks and milestones, to assign resources to tasks, set dependencies, conduct earned value analysis and so forth. Workbench also features a powerful “Auto Schedule” feature which uses an internal set of rules to create a schedule that takes into account a number of constraints, dependencies, and priorities to automatically generate the best method for project completion. Allmerica does not take advantage of the scheduling features of Workbench at the present time due to the fact that resources are not

tracked across different projects; that is, it is possible for two Project Managers to assign a single individual to two tasks in the same time span without being aware of a conflict.

Allmerica was looking to implement resource planning in late Q4 2004, however has not met that goal as of the completion of this report. (Kathy Massad, Personal Communication, 2004).

Workbench is not considered to be as friendly to beginner users as Microsoft Project and has not had any major revisions in several years. Niku believes that the push to open source can bring about new development activity and better serve customers. In addition, the company has made Workbench interoperable with Niku 6 as well as its successor, Clarity, a server-side solution which offers a number of features including coordination of activities between desktop installations of Workbench.

Allmerica standards mandate that Workbench be used by PM's for the building of project plans and state that Microsoft Excel is not a valid substitute product. (AGPM, 2003) In addition, all Project Managers are given a three day training course on the use of Workbench upon their initial assignment to the Project Manager position. Features of workbench beyond simple phase definitions and project plan templates are not widely used within the organization at this stage.

2.4.2 Niku 6

Niku 6 is a large-scale web-based application that claims to give large organizations real-time entrepreneurial agility. The program integrates a series of core modules including knowledge management, portfolio planning, resource and project planning, financial management, and dashboard reporting. The program offers features to address enterprise-

wide collaboration and work delivery, as well as visibility into corporate operations. (Niku, 2004)

The project management aspect of Niku 6 relies on its close integration with Workbench. The latter software can be used by Project Managers as a thick-client desktop application, thus leveraging the power of such an operating environment. In addition, the project data is seamlessly transferred to Niku 6 for occasional web-based viewing or modification.

Niku 6 is built upon a foundation of a single Oracle database with a web-based front-end in the form of portal pages which include small “portlet” windows that present a defined functionality or view to the user. Niku claims that these portal pages can be easily personalized by users.

Allmerica has rolled out the Niku 6 package very recently and does not currently utilize much of the functionality that is offered. The time-tracking features are used as a replacement for the stand-alone Niku Time application, and some project managers view project plans using the web-based interface, but there is no wide scale use of the core feature set at present.

2.4.3 Microsoft Excel

Microsoft Excel is used widely within Allmerica for project management purposes. Excel is the format utilized for PM reports such as the BASD weekly status report and dashboard, and is also used for keeping track of issue and risk logs.

Excel is part of the Microsoft Office productivity suite and is distributed as part of Office XP to all Allmerica desktop computers. The software was originally introduced by

Microsoft in 1985 and became the dominant spreadsheet program for personal computers in 1993. Excel has been utilized by many businesses for purposes outside of the software's spreadsheet/accounting core feature set. Allmerica utilizes the Excel format for reporting and log tracking because the software provides users with a great deal of flexibility for formatting and modifying data. Excel is likewise built upon a click-and-drag interface which is familiar and easy to use.

Allmerica has created a number of Excel templates which serve to aid project teams in creating reports or updating logs. Team members and Project Managers regularly open templated spreadsheets and enter in data relevant to their particular project. Reports and logs are saved as .xls files within ATS and BASD WPD file shares. Printed versions of these reports are likewise routinely used.

Microsoft Excel integrates the Visual Basic for Applications (VBA) scripting environment. This scripting environment allows for user-defined code to be executed within a spreadsheet. Common tasks accomplished using VBA include pulling in data from a variety of sources or processing information contained within a spreadsheet.

2.4.4 Oracle

Oracle Corporation's flagship product is Oracle Database, an advanced relational database platform. Oracle is routinely used for product as well as internet-based applications across a number of different environments. Oracle is generally considered to be an industrial-strength database able to effectively store and retrieve large amounts of data and serve a considerable number of concurrent users.

Niku has developed its Niku 6 web-application upon an Oracle database structure which includes a considerable number of tables with defined relationships. Niku supports interfacing with this back-end via XML, though direct access to the Oracle tables is also possible. This can be accomplished using the Oracle-provided command-based SQL*Plus tool or via more sophisticated graphical third-party programs such as Toad from Quest Software. The latter package is commonly used by Allmerica developers who work with Oracle.

2.4.5 IBM WebSphere Studio Application Developer

IBM WebSphere Studio Application Developer (WSAD), or simply WebSphere, is a visual development environment for designing and deploying web applications based on Java 2 Enterprise Edition (J2EE). WebSphere is a feature-enhanced version of the free and open source Eclipse development environment. WebSphere provides much of the functionality expected in a modern IDE such as code completion and highlighting, syntax checking, and advanced debugging. A full java web server is also integrated into the software package, allowing developers to develop and test deployment on their local machines.

WebSphere is the preferred web application development platform at Allmerica Financial. Several internal WebSphere-based web servers power the applications on the Allmerica intranet. Typical WebSphere development practice includes local development, followed by deployments in the user testing and integration environment, and finally on the production servers.

2.5 Needs for Process Improvement

Through a comparison of Allmerica’s documented procedures and our observations concerning how project activities are actually carried out and researching guidelines in project management best practices, we have identified three procedural areas that require improvement: ATS and BASD cooperation, project control, and project reporting. Each of these three areas affects one or more of the nine project management knowledge areas established by the PMI. These knowledge areas in turn affect one or more of the PMI’s five major process groups as shown previously in Table 2.1.

In the following sections, we treat all deviations from documented procedures as possible issues even if they have proven to benefit the projects with which they were used. It is important for Allmerica to align its procedures as closely as possible to realistic best practices so that documentation of what is actually occurring in the organization exists for both execution and review.

2.5.1 ATS and BASD Cooperation

After a discretionary project has been accepted into a program, one project manager is assigned from ATS and one from BASD. These peer project managers must communicate with each other throughout the life of the project in order to ensure that the final product meets the needs of the requesting customer. This customer may be any organizational unit within Allmerica that has had a requested project approved.

The first documented occurrence of ATS and BASD interacting is through the BASD sponsored “project kickoff meeting” which involves all project leaders as well as the

customer. Despite the fact that this meeting's proceedings are well explained in the BASD training manual (New Hire Training Packet, 2004), it bears no mention in any ATS documents. This theme is common throughout both the ATS procedures manual and the ATS Guide to Project Management (AGPM) as neither document references BASD at any point during a project's life. Procedures that would seemingly require the presence of BASD personnel are said to involve "the customer". However, "the customer" is also misleadingly referenced as a representative from business in other parts of the manual. This means that the term "customer" can refer to either a BASD representative or the final owner of the system depending on the context. This discrepancy can be explained by the fact that ATS's procedures were created before BASD was shifted under the same CIO as ATS.

Although BASD's training documents describe the actual project management situation more accurately, discrepancies still exist. For instance, BASD's procedures make no mention of how often a project manager should meet with his or her ATS counterpart. This results in a wide variance between project managers concerning the frequency of peer project manager interaction with some in daily contact and others in monthly communication. These meetings are not specially documented, making it impossible for a Program Manager to gauge the amount of cooperation between BASD and ATS that took place on a particular project.

These issues fall under the knowledge area of Project Communications Management; more specifically, communications planning and information distribution. Under this knowledge area, project managers are expected to identify project stakeholders and distribute information accordingly. Currently there are no procedures that define when and how frequently information should be shared between ATS and BASD.

2.5.2 Project Control

Allmerica could benefit from the improvement of several processes and practices which deal with the creation, execution, and revision of project plans.

A number of project managers have mentioned that they have encountered a number of difficulties while using Niku Workbench. One BASD Project Manager stated that Workbench is too complicated to make it worthwhile to enter the day-to-day tasks changes that occur during a project's life. Another BASD Project Manager explained that his three-day Workbench training course left him wanting more skills if he was to properly and effectively use what he considers an unintuitive program. This same Project Manager also mentioned that Microsoft Project is used at times as a replacement to Niku Workbench when PM's find its functionality more appropriate. It was also discovered that some Project Managers were using their own custom made task tracking spreadsheets in the place of Workbench for daily updates to project activities.

These Workbench associated concerns hinder the adherence to PMI best practices, specifically with regard to the first knowledge area; Project Integration Management. This segment of the PMI best practices deals with ensuring that all elements of a project are properly coordinated and includes the "project plan development," "project plan execution," and "integrated change control" process groups. The current state of Workbench usage does not appear to allow for the development of accurate and detailed project plans, which as a result hinders effective execution of the plan, and leads to difficulties when changes or adaptations must be made.

2.5.3 Project Reporting

Appendix D shows that a number of different applications and data sources are used during the project reporting process. These data sources include Niku Workbench, Retain, ABC Financial Reports, PRAM logs, TestDirector, Lotus Notes, acceptance logs and others. Furthermore, Appendix D also shows that the reports themselves are created in a number of different formats including Lotus Notes, Microsoft Word, and Microsoft Excel files.

One of the primary concerns expressed by Allmerica Project Managers has been that the current reporting process requires too much coordination of various data sources. On top of the already mentioned software applications, project managers must also reference additional sources such as emails, phone and personal conversations in their status reporting. One project manager told us that it feels like 25% of his time is devoted exclusively towards reporting activities.

Microsoft Office products, particularly Word and Excel, are used extensively in the reporting process. The creation of reports in Microsoft Word in particular demands a large number of manual copy/paste type operations. For example, when ATS project managers receive weekly Microsoft Word status reports from each individual member of a project team they must incorporate information from these reports into an overall project-accurate weekly status report by copying/pasting data. Likewise, monthly status reports require a lot of manual operation such as the copy-and-pasting of project objectives from the existing project plan.

The Project Managers we interviewed have noted that the automation of these tasks would allow them to focus more on the actual work of project management and less on the generation of reports. There are several underlying factors which lead up to this concern,

namely that there is no centralized project management system and that the existing data sources are often logically separated between BASD and ATS repositories.

The use of a large number of software applications throughout the project management cycle as opposed to a single integrated solution increases the complexity of synchronizing and linking data. The only existing link between data sources today is one between Niku Workbench and Retain Resource with regard to the resources assigned to a project. All other data sources require some sort of manual operation if information contained there is needed for a report.

In addition, ATS and BASD have their own separate repositories for project data, which often contain redundant data. Such a situation could lead to project status reports that either have either conflicting or incomplete data.

Reporting covers a range of project management activities and deals with nearly every knowledge area. ATS and BASD generate performance reports which fall under the “Project Communications Management” knowledge area. Specifically, the lack of an integrated system and links in existing data repositories hinder Allmerica’s ability to accurately distribute information across the organization.

2.6 Scope Definition

Out of these needs for process change, we have identified a business problem that our project will address. This problem consists of four areas within the project reporting system which could benefit from improvement:

- a. **Reporting is a time intensive process** - some project managers feel they spend as much as a quarter of their time on reporting alone.

- b. **The generation of reports is not automated** – copying/pasting data is the standard workflow for generating the required reports.
- c. **A great deal of redundancy exists within the reporting system** – the same data is stored in multiple locations. This decreases overall data integrity.
- d. **Existing project management tools such as Niku Workbench are not used to their full potential** – this is due to a lack of knowledge and/or training or due to lack of perceived benefit.

Due to the significant complexity of the project reporting system, our team acknowledged the need to define a pragmatic scope for our project:

In Scope

- Ability to automatically pre-populate weekly status reports and monthly project dashboards with data stored in existing data sources.
- Ability to extend the existing data sources to store additional information including risks, issues, and acceptances.
- Ability to maintain full editing capabilities within weekly status and monthly project dashboards.

Out of Scope

- Automation of any reports outside of ATS & BASD weekly status reports and monthly project dashboards.
- Replacement or modification of any Excel Logs outside of the Risk, Issue and Acceptance Logs.
- Ability to pull data from any sources not based in Oracle.

- Modification of the format (Microsoft Excel) of ATS & BASD weekly status reports and monthly project dashboards.

2.6.1 In-Scope Applications: Excel, IBM Websphere

The scope definition relies on the use of the Microsoft Excel reporting format, and IBM Websphere. These software solutions are all currently deployed within Allmerica and are described in section 2.4, “Review of Related Software used by Allmerica.” The scope is limited to the use of these applications for a number of reasons.

Microsoft Excel provides project managers with a high degree of flexibility and power in preparing Weekly Status and Monthly Dashboard reports. Excel has successfully allowed for the seamless modification of any and all data present in a report, real-time feedback as data modifications are made, and the easy formatting of any reports that are to be printed. Although the tool remains a “spreadsheet application,” the flexibility offered by Microsoft Excel is difficult to match with other environments such as a web-based reporting front end. The current deployment and successful use of Excel for reporting within the organization also minimizes the amount of change management, financial, and development investments needed.

We chose the IBM JAVA development environment, WebSphere Studio Application Developer, to construct the web based system in the scope of our work. Allmerica has made substantial investments in this software and utilizes it significantly for in-house development. In addition, there were a number of pre-defined classes and modules that we could use in the creation of our solution. We also determined that creating a system that takes advantages of Allmerica’s investment is in line with the company’s objectives.

3. Proposed System

The defined business problem identified the need for a central project management portal, herein called the PM Portal, that could store and output necessary project information. Fortunately, Allmerica had already made investments in software and tools that made the creation of such a system possible.

The Niku 6 system is an existing Allmerica project data store that holds project identifiers, budget estimates, and task schedules that have been entered in Niku Workbench. Information from this database is pushed on a weekly basis to an “ATS Data Repository” database which includes additional ATS & BASD data such as IP identifiers and financials. This repository provides ATS Data Architects with a storage environment that does not have to meet any Niku 6 standards and is more tailored towards the needs of Allmerica. Beneath both Niku 6 and the ATS Data Repository are robust Oracle databases with the capacity to hold additional project information.

We proposed a system to tie these existing data-stores together and introduce integration with Allmerica’s primary reporting tool, Excel. Herein this system of Excel and web integration will be referred to as the Project Reporting System, or PRS. Our goal in creating the PRS was to leverage Allmerica’s existing investments to provide maximum functionality and benefit to ATS and BASD Project Managers.

3.1 Functional Requirements

The following functional requirements were identified for the creation of the PRS.

Web-based entry and modification of Issues, Risks, and Acceptances

- Project Managers and team members should have access to a single point of entry to input, modify, and view issues, risks, and acceptances.

Population of Weekly ATS & BASD Status Reports

- After a PM opens the weekly status report template, the option should be available to populate the report's general project information and "Project / Deliverable Schedule Status" sections from information currently stored in the ATS Data Repository.
- The option should be available to populate the "Testing" section from information stored in the Test Director database.
- The option should be available to populate the "Issues/Risks" and "Acceptance" sections from information not currently stored in the ATS Data Repository database.
- Project Managers should have the ability to update or manually change any information contained in the report after the pre-fill.

Population of Monthly ATS & BASD Dashboard Reports

- After a PM opens a new monthly project dashboard, the option should be available to populate the "Project Information", "Overall Project Dashboard", and "Schedule" sections from information contained in the weekly status report.

- The option should be available to populate the “Budget” section from information currently stored in the ATS Data Repository database.
- The option should be available to populate the “Risks/Issues” section from information not currently stored in the ATS Data Repository.
- Project Managers should have the ability to update or manually change any information contained in the report after the population.

3.2 Nonfunctional Requirements

The following nonfunctional requirements were identified for the creation of the PRS.

Operational Requirements

- The system should be able to integrate with existing project management systems and tools including Niku 6, Niku Workbench, and Microsoft Excel.
- The system should be accessible to all Allmerica PMs.
- The system should be accessible to project team members as required.
- ATS should convert to a BASD-like excel weekly status report template.

Look and Feel

- The system has to comply with existing Allmerica user interface guidelines.

Usability

- The system needs to be intuitive and easy to use for both new and experienced Project Managers and team members.

Security

- Access to viewing and modification of project logs should be given only to those who require it.
- Users who enter information should also have privileges necessary to edit that information.
- Administrators should have the ability to access system data.

These functional and non-functional requirements lent themselves towards a phased development approach that offered the benefit an implemented phase one solution while the development effort for phase two was in progress. The following sections describe phases one and two in detail as well as the proposed functionality to be realized with each stage.

3.3 Phase One – Automation of Workbook

3.3.1 Proposed Functionality

We proposed that the first phase use existing data repositories in order to automatically populate parts of the combined ATS and BASD status and dashboard report, herein referred to as the Workbook. This was to be done by writing macros in Excel which would be executed by a Project Manager when a report template had been opened. These macros would access the ATS Data Repository and populate fields in the excel report that correspond to the information stored in the database.

The completion of this phase would allow for a number of benefits. Rather than starting with a blank template for each weekly status report and monthly dashboard, a Project

Manager would have the ability to populate fields with information that they have already entered into different systems. This information would include general project identifiers such as name and IP number, project milestones and schedule, budget information, and testing data.

The proposed results of phase one automation on the workbook are diagramed in Figures 3.1 and 3.2 respectively.

Figure 3-1 Phase One “To-Be” ATS and BASD Weekly Status Reports

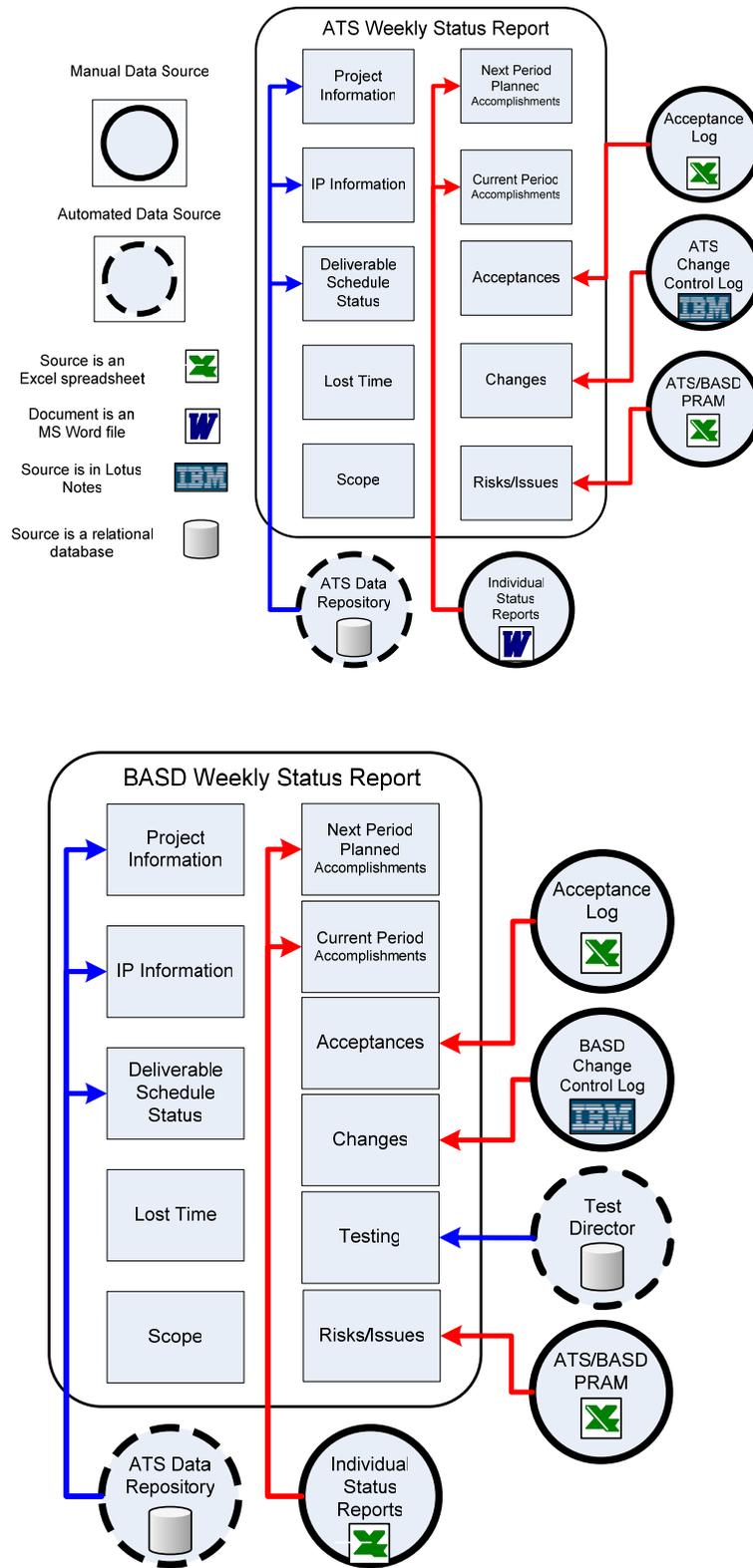
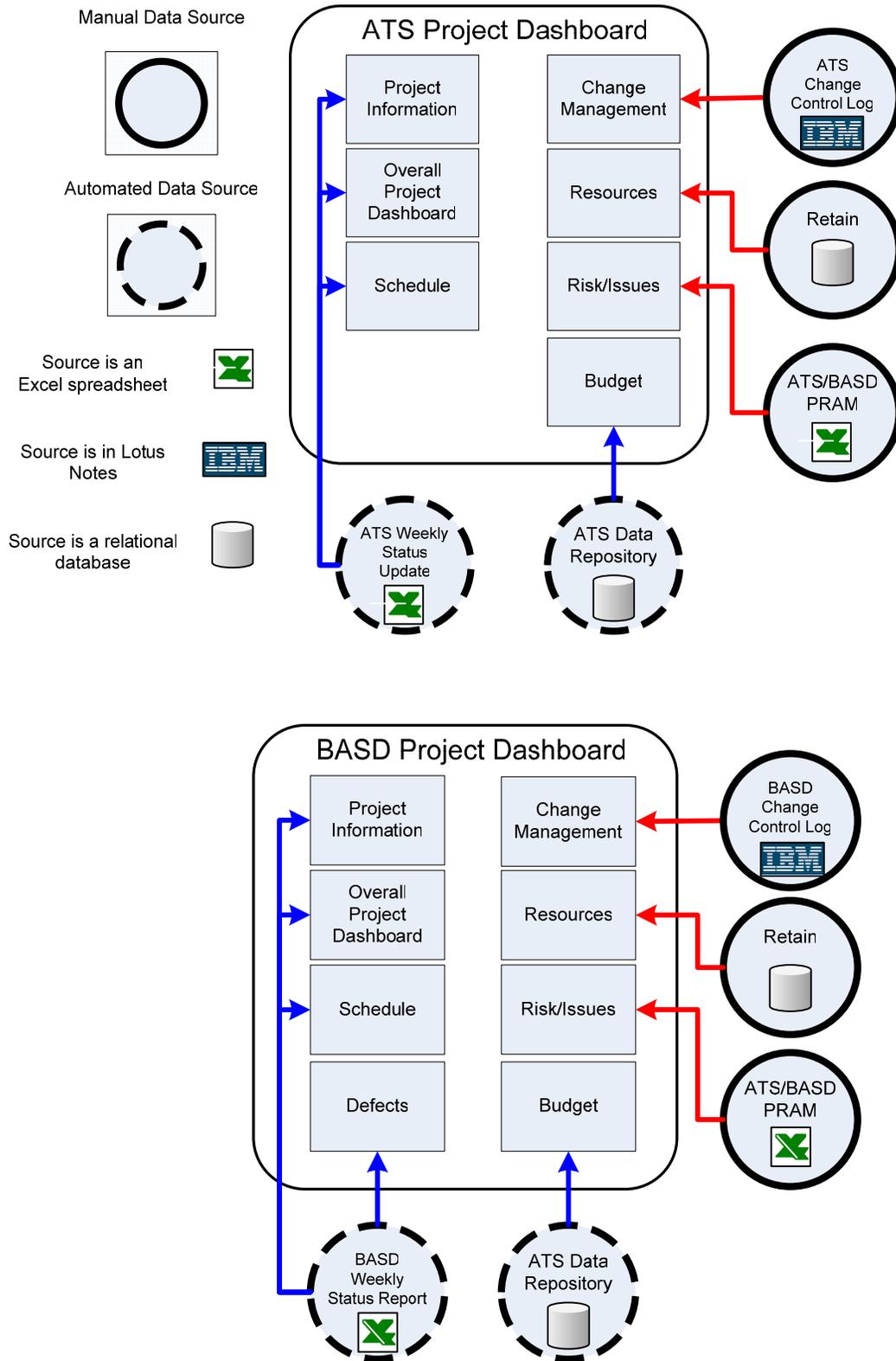


Figure 3-2 Phase One “To-Be” ATS and BASD Dashboard Reports



3.3.2 Use Cases

The following use cases describe how the proposed system responds to the most common activities. The use cases reflect functionality that was to be implemented in the first phase.

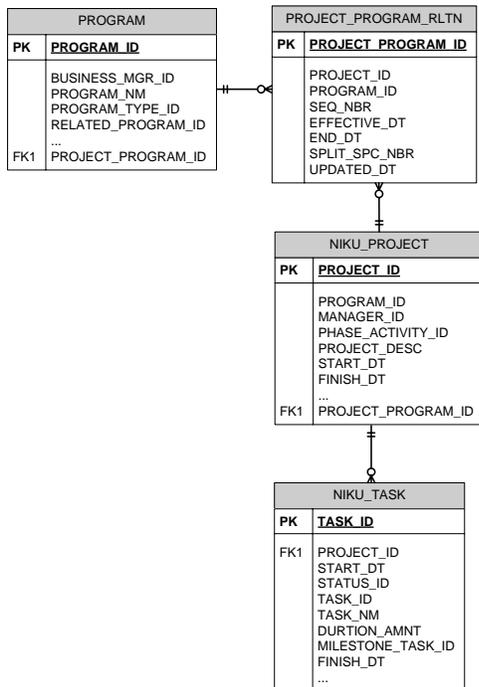
Scenario Name: Project Manager Creates Weekly Status Report		ID Number: 1	
Short Description: This describes how a project manager creates a weekly ATS or BASD status report utilizing the system post phase one.			
Trigger: The time to create a weekly status report has come.			
Type: External / Temporal			
Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
Project Information	ATS Data Repository	Weekly Status Report	WPDB
Project Dashboard	PM, Individual Status Reports, PRAM		
Project/Deliverable Schedule Status	ATS Data Repository		
Current Accomplishments	Individual Status Reports		
Planned Accomplishments	ATS Data Repository		
Acceptance and Change Management	Acceptance Log, Change Log		
Lost Time	PM		
Testing/Defects	Test Director		
Major Steps Performed:		Information for Steps:	
<ol style="list-style-type: none"> 1. Project Manager opens a weekly status report template 2. Project manager enters in his or her Niku project identifying number and clicks on the “populate” button which populates report fields with information. 3. Project Manager makes modifications to pre-populated data such as selecting appropriate planned accomplishments to be reported for the current week. 4. Project Manager fills out information which has not been pre-filled; current accomplishments, change management, lost time, and some project dashboard data from various logs. 		<p>I: Project Information Project Dashboard Project/Deliverable Schedule Status Current Accomplishments Planned Accomplishments Acceptance and Change Management Lost Time Testing/Defects</p> <p>O: Weekly Status Report</p>	

Scenario Name: Project Manager Creates Monthly Dashboard Report		ID Number: 2																						
<p>Short Description: This describes how a project manager creates a monthly ATS or BASD dashboard report utilizing the system post phase one.</p>																								
<p>Trigger: The time to create a monthly dashboard report has come. Type: External / Temporal</p>																								
<p>Major Inputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Project Information</td> <td>Last Weekly Status Report (LWSR)</td> </tr> <tr> <td>Project Dashboard</td> <td>LWSR</td> </tr> <tr> <td>Schedule</td> <td>LWSR</td> </tr> <tr> <td>Budget</td> <td>PM</td> </tr> <tr> <td>Risks/Issues</td> <td>LWSR, PRAM</td> </tr> <tr> <td>Testing/Defects</td> <td>LWSR, Test Director</td> </tr> <tr> <td>Scope/Requirements</td> <td>Change Control Log</td> </tr> <tr> <td>Resources</td> <td>PM (Retain Resource)</td> </tr> </tbody> </table>		Description	Source	Project Information	Last Weekly Status Report (LWSR)	Project Dashboard	LWSR	Schedule	LWSR	Budget	PM	Risks/Issues	LWSR, PRAM	Testing/Defects	LWSR, Test Director	Scope/Requirements	Change Control Log	Resources	PM (Retain Resource)	<p>Major Outputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td>Monthly Dashboard Report</td> <td>WPDB</td> </tr> </tbody> </table>	Description	Destination	Monthly Dashboard Report	WPDB
Description	Source																							
Project Information	Last Weekly Status Report (LWSR)																							
Project Dashboard	LWSR																							
Schedule	LWSR																							
Budget	PM																							
Risks/Issues	LWSR, PRAM																							
Testing/Defects	LWSR, Test Director																							
Scope/Requirements	Change Control Log																							
Resources	PM (Retain Resource)																							
Description	Destination																							
Monthly Dashboard Report	WPDB																							
<p>Major Steps Performed:</p> <ol style="list-style-type: none"> 1. Project Manager opens a monthly dashboard report template 2. Project manager enters in his or her Niku project identifying number and clicks on the “populate” button which populates report fields with information. 3. Project Manager makes modifications to pre-populated data such as selecting appropriate issues/risks to be reported for the current month. 4. Project Manager fills out information which has not been pre-filled; scope requirements, and resources from various logs. 		<p>Information for Steps:</p> <p>I: Project Information Project Dashboard Schedule Budget Risks/Issues Testing/Defects Scope/Requirements Resources</p> <p>O: Monthly Dashboard Report</p>																						

3.3.3 Entity Relationship Diagram

The entity relationship diagram below illustrates the “as is” structure of the tables that were to be accessed during phase one. The PROGRAM table contains information specific to investment proposals. A relational table, PROJECT_PROGRAM_RLTN links the PROGRAM table with the NIKU_PROJECT table, creating a many-to-many relationship between the tables. This allows multiple projects to be assigned to one program and multiple programs to be assigned to one project. Although it is rare that multiple programs are assigned to one project, there is currently one instance at Allmerica. The NIKU_TASK table contains information regarding specific tasks and milestones within the project.

Figure 3-3 Phase 1 Entity Relationship Diagram



3.4 Phase Two – Web-Portal

The changes to be implemented in phase one were not meant to be taken as a complete long-term solution as they did not account for the automation of other project management data sources such as the PRAM and acceptance logs stored as separate Excel files located in various directories in the ATS/BASD WPDB. A true central storage repository for project data would be necessary to provide reliable and centralized sources for automated reports to draw upon. This created a need for the introduction of a second phase that focused on extending the functionality of the ATS Data repository and replacing Excel as a data source.

3.4.1 Functionality

This phase was designed to re-engineer the processes and technologies surrounding project reporting in order to expand the possibilities for automation. The second phase was to leverage the functionality of the ATS Data Repository and allow for the replacement of certain Excel-based logs within the project management process and the further automation of the workbook.

In phase two we proposed to build web portal pages, jointly called the PM Portal, that would allow project managers and team members to input data currently stored in the PRAM and acceptance logs via a web-based interface. Each page within this interface would be displayed as a tab, making it easy for project managers to navigate to various stores of valuable project information. Project Managers and project team members would log in to the web-based application via the existing Lightweight Directory Access Protocol (LDAP)

authentication process and would be presented with web pages that allow for the entry, viewing, and modification of this data.

Data input through this system would be entered into the ATS Data Repository via JAVA servlets. The automated population system introduced in phase one would then be leveraged to populate other sections of the workbook from these new data sources. These sections include “Issues,” “Risks” and “Acceptances.” The results of proposed phase two automation capabilities added to weekly status reports and monthly dashboards are shown in Figures 3.4 and 3.5 respectively.

Figure 3-4 Phase Two “To-Be” BASD and ATS Weekly Status Reports

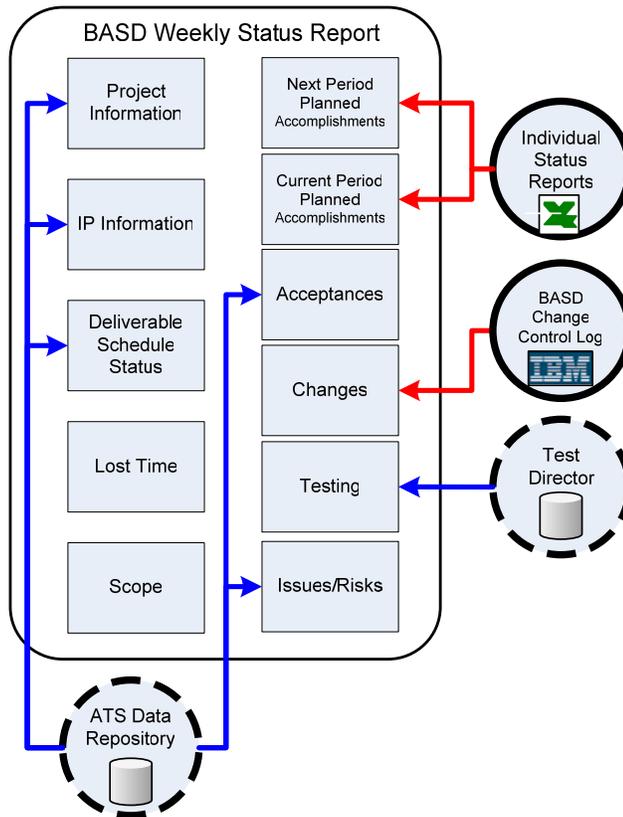
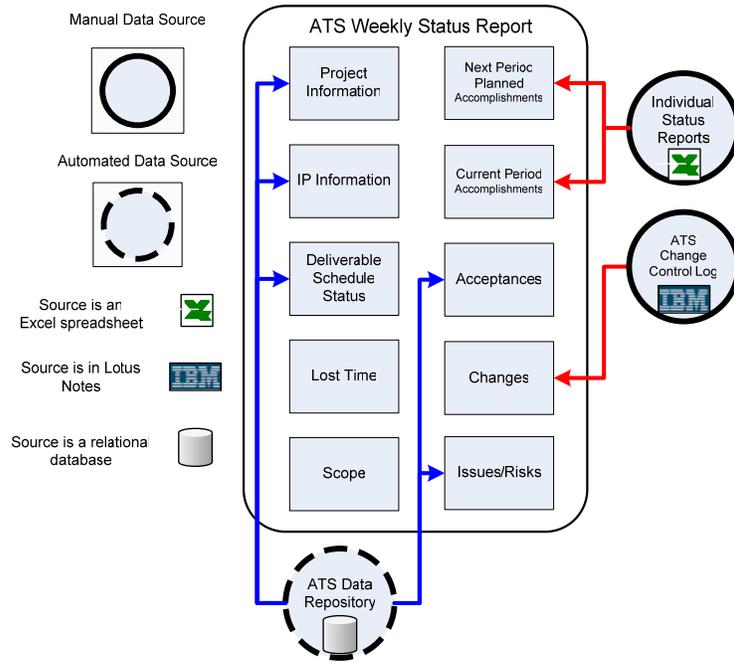
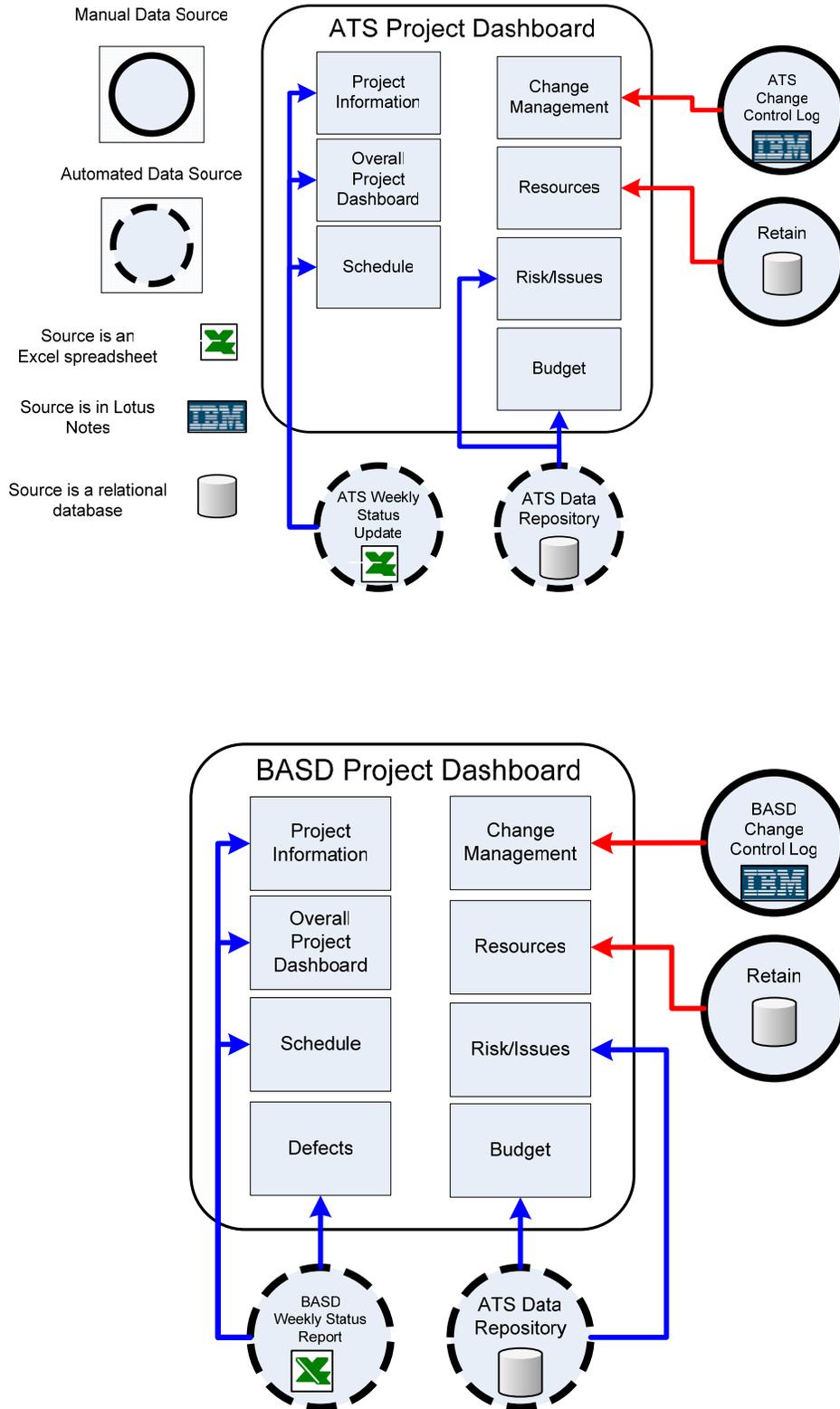


Figure 3-5 Phase Two “To-Be” BASD and ATS Monthly Dashboard Reports



3.4.2 Use Cases

The following use cases describe how the proposed system responds to the most common activities. The use cases reflect functionality proposed for the second phase.

Scenario Name: Project Manager Creates Weekly Status Report		ID Number: 1
Short Description: This describes how a project manager creates a weekly ATS or BASD status report utilizing the system post phase two.		
Trigger: The time to create a weekly status report has come.		
Type: External / Temporal		
Major Inputs:		Major Outputs:
Description	Source	Description
Project Information	ATS Data Repository	Weekly Status Report
Project Dashboard	PM, Individual Status Reports, ATS Data Repository	WPD
Project/Deliverable Schedule Status	ATS Data Repository	
Current Accomplishments	PM	
Planned Accomplishments	ATS Data Repository	
Acceptance and Change Management	ATS Data Repository	
Lost Time	PM	
Testing/Defects	ATS Data Repository	
Major Steps Performed:		Information for Steps:
<ol style="list-style-type: none"> 1. Project Manager opens a weekly status report which has been pre-populated with project information, project dashboard, schedule status, planned accomplishments, acceptance and change management information and testing/defects data. 2. Project Manager makes modifications to pre-populated data such as selecting appropriate issues/risks to be reported for the current week. 3. Project Manager fills out information which has not been pre-filled; current accomplishments, lost time, and some project dashboard data. 		I: Project Information Project Dashboard Project/Deliverable Schedule Status Current Accomplishments Planned Accomplishments Acceptance and Change Management Lost Time Testing/Defects O: Weekly Status Report

Scenario Name: Project Manager Creates Monthly Dashboard Report		ID Number: 2																						
<p>Short Description: This describes how a project manager creates a monthly ATS or BASD dashboard report utilizing the system post phase two.</p>																								
<p>Trigger: The time to create a monthly dashboard report has come. Type: External / Temporal</p>																								
<p>Major Inputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Project Information</td> <td>Last Weekly Status Report (LWSR)</td> </tr> <tr> <td>Project Dashboard</td> <td>LWSR</td> </tr> <tr> <td>Schedule</td> <td>LWSR</td> </tr> <tr> <td>Budget</td> <td>ATS Data Repository</td> </tr> <tr> <td>Risks/Issues</td> <td>ATS Data Repository</td> </tr> <tr> <td>Testing/Defects</td> <td>ATS Data Repository</td> </tr> <tr> <td>Scope/Requirements</td> <td>ATS Data Repository</td> </tr> <tr> <td>Resources</td> <td>PM (Retain Resource)</td> </tr> </tbody> </table>		Description	Source	Project Information	Last Weekly Status Report (LWSR)	Project Dashboard	LWSR	Schedule	LWSR	Budget	ATS Data Repository	Risks/Issues	ATS Data Repository	Testing/Defects	ATS Data Repository	Scope/Requirements	ATS Data Repository	Resources	PM (Retain Resource)	<p>Major Outputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td>Monthly Dashboard Report</td> <td>WPD</td> </tr> </tbody> </table>	Description	Destination	Monthly Dashboard Report	WPD
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Project Dashboard	LWSR																							
Schedule	LWSR																							
Budget	ATS Data Repository																							
Risks/Issues	ATS Data Repository																							
Testing/Defects	ATS Data Repository																							
Scope/Requirements	ATS Data Repository																							
Resources	PM (Retain Resource)																							
Description	Destination																							
Monthly Dashboard Report	WPD																							
<p>Major Steps Performed:</p> <ol style="list-style-type: none"> 1. Project Manager opens a monthly dashboard report which has been pre-populated with project information, dashboard, budget, risks/issues, testing/defects, and scope/requirements. 2. Project Manager makes modifications to pre-populated data such as selecting appropriate issues/risks to be reported for the current month. 3. Project Manager fills out information which has not been pre-filled, specifically the resources section which is based on reports generated from Retain Resource. 		<p>Information for Steps:</p> <p>I: Project Information Project Dashboard Schedule Budget Risks/Issues Testing/Defects Scope/Requirements Resources</p> <p>O: Monthly Dashboard Report</p>																						

Scenario Name: Project-team member enters new “Issues/Risks” or “Acceptance” information		ID Number: 3										
<p>Short Description: This describes how a project-team member can enter in new “Issues/Risks” or “Acceptance” information post phase two.</p>												
<p>Trigger: A new piece of data classified as “Issues/Risks” or “Acceptance” needs to be entered into the system.</p> <p>Type: External / Temporal</p>												
<p>Major Inputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Information to be added</td> <td>Team-Member</td> </tr> <tr> <td>User’s LAN ID</td> <td>Niku 6</td> </tr> </tbody> </table>		Description	Source	Information to be added	Team-Member	User’s LAN ID	Niku 6	<p>Major Outputs:</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td>Added information</td> <td>ATS Data Repository</td> </tr> </tbody> </table>	Description	Destination	Added information	ATS Data Repository
Description	Source											
Information to be added	Team-Member											
User’s LAN ID	Niku 6											
Description	Destination											
Added information	ATS Data Repository											
<p>Major Steps Performed:</p> <ol style="list-style-type: none"> 1. Team-member opens “Issues/Risks” or “Acceptance”, Niku portal page for a particular project. The system checks the user’s LAN ID. 2. Team member enters in new information and submits it. 		<p>Information for Steps:</p> <p>I: User’s LAN ID Information to be added</p> <p>O: Added information</p>										

Scenario Name: Project-team member updates “Issues/Risks” or “Acceptance” information.		ID Number: 4
Short Description: This describes how a project-team member can update “Issues/Risks” or “Acceptance” information post phase two.		
Trigger: A new piece of data classified as “Issues/Risks” or “Acceptances” needs to be entered into the system. Type: External / Temporal		
Major Inputs:		Major Outputs:
Description List of existing “Issues/Risks” or “Acceptance” information Updated information User’s LAN ID	Source ATS Data Repository (presented via Niku 6) Team-Member Niku 6	Description Updated information Destination ATS Data Repository
Major Steps Performed:		Information for Steps:
<ol style="list-style-type: none"> 1. Team-member opens “Issues/Risks” or “Acceptance” Niku portal page for a particular project. The system checks the user’s LAN ID. 2. Team-member views list of existing “Issues/Risks” or “Acceptance” items and selects one to update. 3. Team member updates information and submits it. 		<p>I: List of existing information Information to be updated User’s LAN ID</p> <p>O: Updated information</p>

3.4.3 Entity Relationship Diagram

The entity relationship diagram included as Appendix J shows the Niku Project table in the ATS Data Repository and the three tables that we proposed to add as part of phase two, each of the tables replacing existing Excel logs. These tables have a one-to-many relationship with the NIKU_PROJECT table, signifying that one or more issue, risk, or acceptance can exist per project.

3.5 Feasibility Analysis

3.5.1 Technical Feasibility

We believed the proposed changes to the reporting system were technically feasible. The following discussion details certain areas of risk we identified and how they were addressed by our team.

As individuals external to the company, our team had no prior experience with the current project management reporting process: this posed as our initial risk. Due to the large number of different technologies, processes, and employees that are involved in the reporting system, much research and investigation into the structure and nature of the system was necessary for us to understand it. This was conducted via interviews with experienced users of the system and its related processes as well as through research into related documents.

After identifying the technologies associated with the reporting system, our team was confident that we would be able to handle most technical obstacles that would arise during the time of development. However, some technologies and applications were new to us and therefore posed risks: Niku Workbench, Niku 6, Oracle, TOAD, and WebSphere. Most significantly, no member of our team had had previous experience with Oracle or

WebSphere. We overcame these risks by utilizing our current knowledge base and supplementing it with relevant documentation and the use of the guidance and expertise of resident Allmerica subject matter experts.

The initial scope of this project was overwhelmingly demanding. The project reporting system consisted of many processes which were integral to efficient performance of projects within all of Allmerica; this posed the risk of possibly undertaking a project that was far too large and complex to complete within the contracted time of our stay. Therefore, our project team, consisting of four members, proposed to make the best use of all ATS and BASD resources at our disposal in order to maximize the effectiveness of our efforts in this project. In order to adopt a project of manageable size and scope, our team worked hard in the early stages and identified problem processes within the system which were within our technical expertise and Allmerica's ability to adopt organizational change. These processes were identified through interviews with project stakeholders who were frequent users of the system and understood its strengths and weaknesses.

3.5.2 Organizational Feasibility

Kathy Massad was our project champion representing ATS and Rhett Gibbs was our project champion representing BASD. Having equal representation from the two divisions which perform project status reporting was a great advantage. Our project champions helped us gain access to many vital resources within ATS and BASD. In addition, their support and interest in the success of the project provided us with organizational credibility and recognition.

There was a definite risk associated with how the users were going to react to the change in the system once implemented. Whether or not we would see implementation

firsthand, we wanted to account for how it should be handled to minimize the disruptions in workflow. The primary users of our solution would be ATS and BASD PM's who currently use the existing reporting system. Secondary users would be any other management personnel involved with a project, such as PMO personnel or systems administrators, due to their ability to make decisions and contribute content that could influence the project.

The functionality brought about as a result of the first and second phases of development would change some business processes, such as those for keeping track of issues, risks, and acceptances. The system would also introduce some new users to these tasks, such as those who would not have previously entered issue/risk/acceptance data first hand, but would have passed it off to the project manager. To reduce the potential of problems occurring from these changes, we provided user documentation explaining how to use the new functionality. This documentation is included in Appendix F.

3.5.3 Economic Feasibility

Development Costs

Allmerica agreed to pay \$6,000 to WPI for our team to develop a solution to the project reporting system problem. This cost covered all the necessary WPI overhead. In addition, we also needed to account for the time we spent with ATS and BASD employees, as well as the time they spent on our project. We scheduled hour-long weekly meetings with our liaisons, Kathy Massad and Rhett Gibbs, as well as with the ATS Data Architect, Chris Sullivan, in order to help guide us during our project. Also, during the Planning and Analysis stages of our project, we interviewed several personnel within the organization. Additionally, we needed to consider the time costs of having our solution approved by the Quality Control team, implemented by Allmerica, and finally, the training needed for system users. We

considered the cost of this time to be relevant to development. The following is a breakdown of our cost estimations:

Table 3-1 Project Cost Estimations

Weekly Meetings with Kathy Massad and Rhett Gibbs	\$ 3,410
Weekly Meetings with Chris Sullivan	\$ 1,548
Interviews with Project Managers	\$ 848
Development Licenses	\$ 3,200
Quality Control	\$ 938
Implementation	\$ 589
Training	\$ 3,897
Total	\$ 14,426

These figures were based on average salaries indicated in the Bureau of Labor Statistics' National Compensation Survey for the Boston-Worcester-Lawrence area, which was administered in 2003. They are also based upon interactions that we had with Allmerica employees:

- Meetings with Rhett, Kathy and Chris were scheduled once a week for one hour during our twenty-one week stay.
- We met with other project managers and employees for an average of one hour every other week.
- Quality Control required no more than 2 people for approximately 4 hours for phase 1, and 2 people for approximately 16 hours for phase 2.
- Implementation took approximately two person days.

- Training consisted of an hour long seminar for all project managers, as well as modifications to appropriate process manuals.

Annual Benefits

We anticipated that by decreasing the amount of manual labor necessary for certain project status reporting processes, ATS and BASD PM's would have more time to dedicate to other responsibilities.

Based upon results from a survey administered to Project Managers about the amount of time spent on project reporting, it was found that the average amount of time spent completing a monthly dashboard was approximately thirty-six minutes and the average amount of time spent completing a weekly status report was nineteen minutes.

The monthly dashboard report consists of six sections, which averaged to approximately six minutes per section, four of which we automated. Automation should reduce the time needed to complete a section to about one minute, effectively saving approximately twenty minutes in preparing a monthly dashboard. Furthermore, the weekly status report consisted of twelve sections, which averaged to approximately three minutes per section, four of which we automated. Automation should reduce the time needed to complete a section to about one minute, effectively saving approximately eight minutes in preparing a weekly status report.

Also, we estimated that there are approximately one-hundred projects going on at any one time within Allmerica. Based on average salaries indicated in the Bureau of Labor Statistics' National Compensation Survey for the Boston-Worcester-Lawrence area, which was administered in 2003, yearly savings that Allmerica will experience due to increased project manager efficiency were conservatively estimated as follows:

Benefits from monthly status report	\$ 6,472
Benefits from weekly status report	\$ 10,355
Total	\$ 16,827

Intangible Costs and Benefits

ATS is currently CMM level 3 certified. By providing a solution that helps to maximize the time efficiency of the process reporting system, we would be effectively supporting and strengthening the ideals of CMM within Allmerica. Additionally, the system helps to promote the use of Niku Workbench amongst ATS and BASD PM's, which coincides with the goals of the Project Management Office. Furthermore, the implementation of our proposed solution should result in more productive and effective project managers.

Table 3-2 Summary of Costs and Benefits

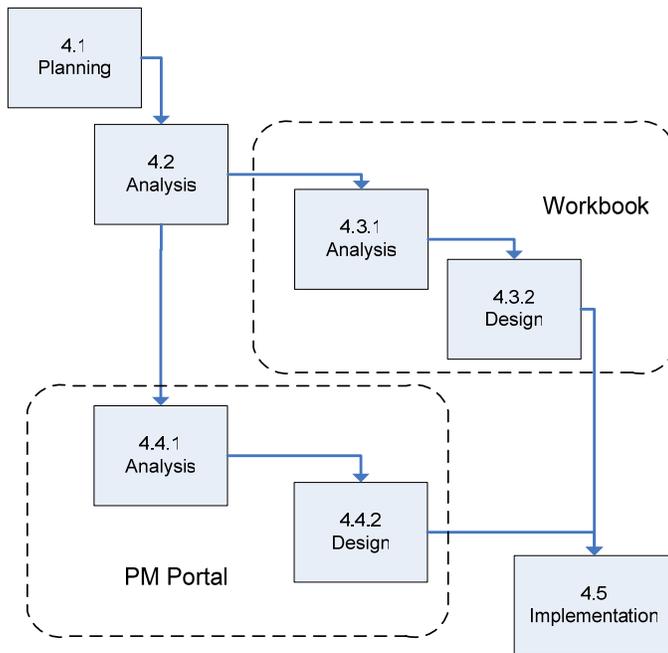
One-time Costs*	
Developments labor	\$6,000
Employee Time	\$5,806
Software Licenses	\$3,200
System Integration	\$5,425
Total	\$20,432
Annual Benefits	
Time saved on weekly reports	\$ 10,355
Time saved on monthly reports	\$ 6,472
Total	\$ 16,827
Return on Investment	82.35%
Break-even Point	1.21 years

*Employees time consists of time spent with the liaisons, the Data Architect, and all other necessary ATS employees. System Integration includes Quality Control, Implementation, and Training.

4. Methodology

It is important for any project team to agree upon a formalized system development methodology in order to ensure that the system to be implemented matches the requirements of the users as closely as possible in an agreeable amount of time. Our system proposal called for a phased development methodology which would implement some functionality through phase one, move to implement that phase, and later add additional functionality with a separate design and implementation of phase two. As we progressed, it became apparent that a parallel system development methodology would make better use of our idle resources. With this methodology, two defined pieces of functionality were worked on simultaneously and brought to implementation at their completion. For our purposes we also restructured the “phase one” and “phase two” terminology, using “phase one” to refer simply to the excel VBA workbook component and “phase two” to refer to the PM Portal development. The parallel methodology approach we used is shown in figure 4.1 on the next page.

Figure 4-1 Parallel System Development Methodology



4.1 Planning

At project inception, our first task was to conduct background research on Allmerica, the ATS and BASD organizations, current project management practices, and Allmerica's technology solutions. This was completed through informal interviews with our project sponsors and through literature review of internal Allmerica documents. The results of these efforts are shown in chapter 2. This research gave us the ability to create an informed definition of Allmerica's business problem within the context of ATS and BASD project management reporting. The business problem was then further defined through additional literature review and interviews with both BASD and ATS project managers who are the main users of the project status reporting system. These PM's had varying amounts of

experience both with project management and at Allmerica and enabled us to make more educated decisions concerning potential business problems. The questions used in these interviews are listed in Appendix E.

Having identified the business problem, it became necessary to limit the scope of our solution in order to deliver a useful product within the time allotted. This was done by first defining our various time, organizational, technological, and economical constraints and then identifying an area of the business problem within these constraints that provided Allmerica with the most value.

Constraint definition was conducted through questions posed to our project sponsors and our project advisor. Review of previous Allmerica MQP work also helped to provide examples of successfully implemented business solutions that had constraints similar to our project. Through these efforts, we were able to gain a realistic understanding of what types of business problems would be feasible for us to solve.

The results of our planning phase provided us with a well-defined business problem with a realistic scope that, once addressed, would add a great deal of value to Allmerica. We also generated a work breakdown structure within a project plan in order to outline the methodology necessary to complete a successful project (See Appendix K).

4.2 Analysis

With the business problem defined, we were able to create functional requirements for a technological solution. This was done by analyzing results from previous interviews, distributing a questionnaire to ATS and BASD project managers (See Appendix K), and conducting additional interviews that helped clarify what steps would be needed to solve the

business problem. These interviews were held with the ATS Director of Information Systems as well as with an ATS Data Architect. They were able to help clarify how existing Allmerica technologies such as Niku 6 and Niku Workbench could be applied towards a software solution to the business problem. Their insight on the low level workings of these systems provided us with information we were able to apply towards a realistic set of functional requirements.

As our functional requirements were being defined, we selected an initial development methodology: Phased Development. This choice was a result of our discovering that the target users' requirements could be divided into two distinct sections that offered different functionality. However, it later became apparent that waiting for the implementation of the first phase before beginning the second phase would be unrealistic. It is for this reason that we ended up using a parallel development methodology.

4.3 Workbook

4.3.1 Analysis

The analysis of our solution to automating the workbook consisted of a number of discussions with an ATS data architect that had an understanding of the as-is system, the functional requirements of the to-be system, as well as the technological and organizational constraints of Allmerica. These discussions gave us the opportunity to propose solutions to the data architect that were then evaluated and modified based on his comments. Eventually, both parties were able to settle upon a solution that met the requirements and stayed within constraints of the project.

Further definition was given to our solution by creating use case diagrams. It was understood that phase one would incorporate business process automation, rendering the corresponding use case diagrams very similar to the processes already in use by Allmerica project managers.

4.3.2 Design

The design of the workbook entailed programming VBA methods to access data stored in the ATS Data Repository as well as modifying the workbook UI. During the course of the design of the workbook, we found that an Allmerica team in Howell, Michigan was working on a similar project which sought to automate the testing section of the Weekly Status Report. After this discovery, we moved to communicate our project requirements to this team so that both of our solutions would be compatible within the same workbook. Through remote conference calls and WebEx session we were able to come to a solution which met both of our needs.

Once development on the workbook had reached a level acceptable for testing, we moved on to user testing. During this period, we displayed our progress to 8 project managers as well as 2 members of the PMO. Once user testing was completed we took user suggestions and either implemented them, added them to our Recommendations section (See chapter 6), or in extreme cases, discarded them. A list of user suggested is provided in Appendix I.

4.4 PM Portal

4.4.1 Analysis

The methods used during our introductory analysis phase (Section 4.2) provided us with business requirements for the PM Portal, but further investigation was necessary to determine how these requirements were to be met. We continued to meet with an ATS data architect, Chris Sullivan, to decide upon a solution that was both useful and pragmatic. The creation of the PM Portal was to introduce added tables to the ATS Data Repository which made it crucial that all necessary field names and types were well thought out in advance before being committed. A high level ERD, shown in Appendix J was created in order to describe the data stores that were created and accessed.

4.4.2 Design

The design of the PM Portal was centered on the UI, java servlet, and JSP programming necessary to allow project managers to input, store, edit, and delete information over the web. In order to accomplish this we focused firstly on the “Issues” pages in order to create a working example. This was done so that if any bugs were found in the system, changes would only have to be made to the programming elements of one portal page as opposed to three. Once the issues portal page was finished and internally tested, we had a map of how to replicate that functionality across the risks and acceptances pages.

User testing for the PM Portal was conducted at the same time as the testing for the workbook with 8 PM’s and 2 PMO members following test scripts and offering suggested

improvements. These suggestions were then compiled and either acted upon or added in chapter 6, Recommendations.

4.5 Implementation

Allmerica's implementation procedures involve moving a system through five different environments: development, testing, integration, user acceptance testing, and production. A system must be tested within its environment before it can be moved to the next. As the system moves through environments, the requirements to move to the next environment become more stringent. The results of our progress through these environments are provided in section 5.5.

5. Results

5.1 Introduction

It was a long road starting from the proposal outlined in chapter three to the implementation of our project reporting system into Allmerica's user acceptance testing environment. First we focused on the automated retrieval of project information into the automated workbook. We then focused on the creation of a Project Manager Portal which would facilitate the online entry of issue, risk, and acceptance data. During this construction, we returned to the workbook to accommodate the retrieval of data entered through the PM Portal. These concurrent tasks came together at the end once user testing was conducted, final changes were made, and the system was implemented. This chapter details the relevant decisions that we made and problems that we encountered throughout this process.

5.2 Weekly Status and Monthly Dashboard Automation

5.2.1 UI Design

The Allmerica Combined Status & Dashboard reports were given visual facelifts as part of our MQP project. The reports were re-designed for visual consistency and given a color scheme which matches the web-based PM Portal and Niku 6 web interface. The effects of the redesign can be viewed on the next two pages. The first page shows the weekly status report prior to re-design, and the second shows the report after the re-design. Similar results were achieved with the monthly dashboard report.

Figure 5-1 Weekly Status Report: Before Redesign

Microsoft Excel - BASD weekly status & dashboard.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF Type a question for help

G202 fx

Go To Dashboard Go Back to Front Page

BASD Project Delivery Weekly Status Report

Comparative Rater Pre-Fill Phase VI - September 2004

To: Karen Andrade **Current Phase:** UserTesting

From: Rick Normandin **Period Ending:** 9/3/2004

IP Name: Comparative Rater Pre-Fill - Phase VI **IP Number:** IRM422 NIKU/RMPO

★ **PROJECT DASHBOARD** (if any of the categories below are yellow or red, complete the Description, Resolution Sections for that category)

COMPOSITE G

SCOPE

Description	Resolution Plan	Target E

RESOURCES

Description	Resolution Plan	Target E

SCHEDULE

Ready NUM

Figure 5-2 Weekly Status Report: After Redesign

The screenshot displays a Microsoft Excel spreadsheet titled "Microsoft Excel - UI - Combined Status & Dashboard 07 BM.xls". The spreadsheet is organized into several sections:

- Header (Rows 1-2):** "ATS/BASD Project Delivery Status Report" and "Comparative Rating Pre-fill". The ATS logo is visible in the top right corner.
- Section 1: PROJECT INFORMATION (Row 4):** A blue header bar. To the right, "Business Partners:" is followed by a blank line.
- Form Fields (Rows 5-13):**
 - Row 6: "NIKU/RMPO Number: 2004BUSRP0282" with a "Populate" button.
 - Row 7: "Current Phase: Project Initiation" (text in a box).
 - Row 8: "Project Name: Comparative Rating Pre-fill" (text in a box).
 - Row 9: "Period Ending: 11/13/04" (text in a box).
 - Row 10: "BASD PM: Andrade, Karen" (text in a box).
 - Row 11: "IP Name: " (text in a box).
 - Row 12: "ATS PM: Normandin, Richard" (text in a box).
 - Row 13: "IP Number: " (text in a box).
- Section 2: PROJECT DASHBOARD (Row 16):** A blue header bar. To the right, "COMPOSITE" is written in a box.
- Text (Row 18):** "(If any of the categories below are Yellow or Red, complete the Description, Resolution Plan and Target Date Sections for the...)"
- Section 3: SCOPE (Row 19):** A blue header bar.
- Table 1 (Rows 21-26):** A table with two columns: "Description" and "Resolution Plan".
- Section 4: RESOURCES (Row 27):** A blue header bar.
- Table 2 (Rows 29-34):** A table with two columns: "Description" and "Resolution Plan".
- Section 5: SCHEDULE (Row 35):** A blue header bar.
- Table 3 (Rows 37-40):** A table with two columns: "Description" and "Resolution Plan".

The bottom of the window shows the Excel status bar with "Ready" on the left and "NUM" on the right. The taskbar at the bottom indicates the active window is "Combined Status Report" within a "Combined Dashboard" environment.

Technical elements of the UI Design are described in Appendix G: System Documentation. In addition to the color and layout changes, the report was also reformatted to adequately fit the 800x600 resolution which we found in use among some project managers.

5.2.2 Programming Design

In order to automate the retrieval of project information from an Oracle database into an Excel spreadsheet we decided upon Oracle Objects for OLE (OO4O) which removed the need for complex applications programming interfaces (API's) or external data drivers. With this technology, we were able to more easily develop Visual Basic (VB) Excel macros which connected to the Oracle ATS Data Repository in order to retrieve project information.

In addition to a data retrieval method, we also required a way to represent the data on the Excel spreadsheet. This required researching how to utilize Excel's built-in controls and how these controls could be manipulated by VB macros. These macros would interact with the Excel worksheet in order to populate cells with project information. Our team then decided to develop macros and assign them to control buttons which would execute the macros when clicked. This enabled us to focus on the task of developing the logic, structure, and algorithms of the macro code using the built-in VBA editor for Excel.

The actual process of deciding how to code the macros for the controls was rather straightforward. Each macro's purpose was to contact the ATS Data Repository, retrieve data from it, and then store that data in an object which would then populate certain cells based on which section of the report the macro was for. Therefore, the only difference between the

macros would be in: 1 - The SQL statement sent to the ATS data repository which designated what information would be stored in the recordset object; and 2 – the logic used to determine which cells the recordset data should be populated in. Particular pieces of logic and functionality that were useful in development were ‘If Then’ statements, ‘Case’ statements, ‘While / Wend’ Loops, Global Variables, Excel ‘Named Ranges’, and Excel worksheet ‘Range’ references.

Using this logic, we could determine if the recordset object contained useful data and, if so, directly populate certain cells by setting their values, by use of the Excel worksheet ‘Range’ references, equal to values of the appropriate fields in the appropriate records of the recordset. In other instances, the macro had to be developed for a section where the amount of data being filled in would be dependent on the amount of data that was available. For example, the ‘Project / Deliverable Schedule Status’ section contains multiple rows of information for different milestones in a project’s development, each with a field for planned start date, estimated start date, planned completion date, etc. However, not all of these milestones pertain to every project; therefore, a recordset with project information on Deliverable Schedule Status may have information for some milestones, and not for others.

To accommodate these possibilities in the code, we used ‘Case’ statements to match the first field of the record in the recordset, which holds the name of the milestone, to the name of the milestone in the cell in Excel. In the event of a match, the appropriate date cells for that milestone are populated. This process is encapsulated in a ‘While / Wend’ loop which goes through every record of the recordset and tries to match its milestone field to a milestone in the ‘Project / Deliverable Schedule Status’ section. In addition, ‘Names Ranges’ were implemented for a number of reasons. First and foremost was for maintainability. Since

we were working with an Excel spreadsheet in conjunction with VBA, much of the code referred to actual cell numbers in order for them to be populated. Knowing that this document undergoes change often, we implemented the use of 'Names Ranges', which allows the developer to assign names to cells which would hold the value of these cell references. In the event of worksheet rearrangement or cell movement, any code that references a given cell would not break because the Named Range will now reference a new cell number.

Global Variables became useful when our group encountered a certain 'bug' in the programming of VBA. Every object provided by VBA has a set of methods that can be triggered based on certain actions. For example, a button can have functions programmed for its 'Click' or 'DoubleClick' methods. In this case, we had a dropdown box that was supposed to be populated with Issue and Risk information when the dropdown arrow was clicked. Upon successfully writing and testing the function to do so, we found that after clicking the selection in the dropdown, which is supposed to trigger the 'Click' method, the 'dropdownbuttonclick' method was invoked again instead of the 'Click' method. This effectively rendered our function useless and cleared the dropdown of the previously populated choices. To fix this, it was necessary to declare a global variable that would be called and altered upon the first running of the function written for the 'dropdownbuttonclick' so that when it gets called again during the 'Click' method, it does not run the function. The drawback to this is that this function can only be run once upon opening the workbook. However, a Project Manager would hypothetically only ever need to do this once upon opening the workbook anyway.

5.2.3 Project Information Section

The following is a screenshot of the ‘PROJECT INFORMATION’ section of the Weekly Status Report after we implemented the ‘populate’ button:

Figure 5-3 Weekly Status Report: Project Information section

The screenshot shows a form titled 'PROJECT INFORMATION' with a 'Populate' button. The form contains the following fields:

- NIKU/RMPO Number: 2005PRJRP0005
- Project Name: _____
- BASD PM: _____
- ATS PM: _____
- Business Partners: _____
- Current Phase: Construction (dropdown menu)
- Period Ending: _____
- IP Name: _____
- IP Number: _____

By providing a NIKU/RMPO Number and pressing the ‘populate’ button the ‘Project Name’, ‘IP Name’, and ‘IP Number’ fields will be filled in if they exist for that project:

5.2.4 Issues / Risks Section (Status Report)

The next section in the Status report to be automated was the ‘Issues / Risks’ section shown below.

Figure 5-4 Weekly Status Report: Issues/Risks section

ISSUES/RISKS		
Description	Resolution Plan	Target Date
3 / OS Compatibility / 01/19/2005 4:20:14 PM		

The section contains the ‘Description’, ‘Resolution Plan’, and ‘Target Date’ for Issues or Risks identified on a weekly basis. It has been fully automated by the implementation of a dropdown box for each of the four ‘Description’ cells. The functionality

developed for the dropdown box allows it to be populated with the week’s current issues and risk when the dropdown arrow is clicked. In addition, upon selecting a provided Issue or Risk the ‘Resolution Plan’ and ‘Target Date’ sections will be automatically filled.

5.2.5 Project Scheduling Section

The third section of the weekly status report that was within scope to automate was the “PROJECT / DELIVERABLE SCHEDULE STATUS” section as shown below.

Figure 5-5 Weekly Status Report: Scheduling section

PROJECT / DELIVERABLE SCHEDULE STATUS		Populate			
(should come from NIKU Workplan)					
Major Deliverable / Milestone*	Planned Start Date	Actual/Est. Start Date	Planned Completion Date	Actual/Est. Completion Date	Status
Project Initiation					
Systems Concept Formation					
Business Systems Analysis					
Technical Design					
Construction					
Test Planning & Preparation					
Testing					
Implementation					
Transition & Warranty					
Post Project Summation					

(Only deliverables/milestones shaded above the bold line will transfer to the dashboard)

This section contains the ‘Planned Start Date’, ‘Actual/Est Start Date’, ‘Planned Completion Date’, ‘Actual/Est Completion Date’, and ‘Status’ fields for a number of project phases. Each of the phases under the “Major Deliverable / Milestone *” column correspond

to a phase in the project's project plan. Our Project Reporting System (PRS) automates the pre-filling of the date columns in this section by accessing the NIKU_TASK table which holds information pertaining to individual phases, activities, and tasks for every project plan. However, the PRS is unable to automate this section when non-standard project plans are used.

Allmerica discretionary project plans are standardized through the use of a project plan template that all PM's are required to fill in at the start of their project. This template contains a work breakdown structure (WBS) of all phases, activities, and tasks common to every discretionary project. The PMO instructs PM's to fill in the provided WBS with planned dates and then add more specific activities and tasks if needed. However, what happens in many cases is that project managers rename and restructure parts of their plan to meet their needs. Because our queries rely on phase names that mirror the phase names provided in the template, the PRS will not retrieve any dates for phases that have been renamed in the project plan.

5.2.6 Test Defects

The last section of the Weekly Status Report is the "TESTING" section which is shown on the next page.

Figure 5-6 Weekly Status Report: Testing section

TESTING		Populate (utilizes TestDirector data)					
TEST REQUIREMENTS (throughout life of project)							
		High	Medium	Low	Unknown	Total	
Test Requirements	11/15/2004						
TEST CASE EXECUTION STATUS							
Execution Status (Executed This Week)							
		Failed	Covered	No Run	Passed	Not Complete	Total
10/19/2004 to 10/26/2004							
Manual							
Automated							
Total							
Execution Status (Executed Upto Week)							
		Failed	Covered	No Run	Passed	Not Complete	Total
Upto 10/26/2004							
Manual							
Automated							
Total							

This section holds testing information pertinent to a project’s current phase including number of test conditions and severity of defects for either the user acceptance testing or integration testing phases.

During the analysis portion of our project, we placed the automated population of the defect section “in-scope” due to evidence that defect information was stored in an MS SQL server database which would be accessible through VB code in the templates. Further research showed that testing data for current projects was stored in multiple locations including Lotus Notes, custom Access databases, and Test Director. It became apparent that programming the report templates to determine where a project’s testing data was stored and

then access that location would introduce a level of complexity beyond the original scope. However, we eventually learned that all future projects are required to store their testing data in Test Director and that there was an existing Allmerica project in Howell Michigan dedicated to the automated retrieval of testing data from Test Director into report templates. It is for these reasons that we chose to focus on integrating the results of this remote project with our own template.

After deciding to work with the other project team we held meetings to ensure that the requirements of both projects converged. There were initial problems because the Howell project's solution required that administrators manually update the template every time a project was added to Test Director. This would make it necessary for project managers to download the latest template every time they wished to fill out a report rather than simply opening the previous week's report and continuing from that point. Our project, on the other hand, required that no manual intervention be needed in order to maintain the solution.

We were able to come to a compromise through a solution whereby a field was created within the Test Director database which holds Niku numbers which serve as a primary key identifying each project in the Niku database. With this field in place, we were able to retrieve Test Director information using the same Niku number project managers use to retrieve project plan information. However, there was a small amount of organizational change required as the employee who inputs projects into Test Director would have to first look up the project's Niku number. We minimized this change by providing the Howell team with an Excel file of all of Allmerica's projects and Niku numbers.

5.2.7 Budgeting Section

The first automated section in the Monthly Dashboard is the “BUDGET” section which is shown below.

Figure 5-7 Monthly Dashboard: Budget Section

BUDGET (IN HOURS)									
(select current month to add budget information)					(select current month to add budget information)				
BASD (Cumulative) <input type="text"/>					ATS (Cumulative) <input type="text"/>				
	Baseline	Usage*	Variance	Actual		Baseline	Usage*	Variance	Actual
January	0	0	0	0	January	0	0	0	0
February			0	613	February			0	276
March	0	0	0	0	March	0	0	0	0
April	0	0	0	0	April	0	0	0	0
May	0	0	0	0	May	0	0	0	0
June	0	0	0	0	June	0	0	0	0
July	0	0	0	0	July	0	0	0	0
August	0	0	0	0	August	0	0	0	0
September	0	0	0	0	September	0	0	0	0
October	0	0	0	0	October	0	0	0	0
November	0	0	0	0	November	0	0	0	0
December	0	0	0	0	December	0	0	0	0

* Usage = Actual + Estimate to Complete (ETC)

This section contains the ‘Baseline’, ‘Usage*’, ‘Variance’, and ‘Actual’ fields for project dashboards. For this section, we queried the ATS Data Repository to find baseline, usage, and actual hours that were assigned to either ATS or BASD resources for a particular month. However, only the current values for baseline and usage hours could be retrieved. This created the need for a month drop down box which allows the user to choose for which month values are input.

5.2.8 Risks / Issues Section (Dashboard Report)

The last automated section in the Monthly Dashboard is the Risks / Issues section shown below.

Figure 5-8 Weekly Status Report: Issues/Risks section

RISKS/ISSUES

BASD 1:test risk 1 (select to add risk / issue)

3:Testing with Adam, Complete by 1:00PM, 2/16/2005
1:test risk 1, test action 1, 2/16/2005

ATS (select to add risk / issue)

* Any section with a yellow or red indicator must be addressed in the above section

Typically, this is the section where a Project Manager would provide detail on previously reported Issues and Risks from earlier Status Reports. To help with this task, we developed functionality for a dropdown box that would, upon clicking the dropdown arrow, be populated with a list of risks and issues associated with the project, including their number, description, and declaration date. When selected, an Issue or Risk will populate the textbox shown along with a following carriage return to allow the PM room to write about

the entered Issue or Risk. As with all other functionality we have provided, the Project Manager retains the option to alter and change these choices as provided.

5.3 Project Management Portal

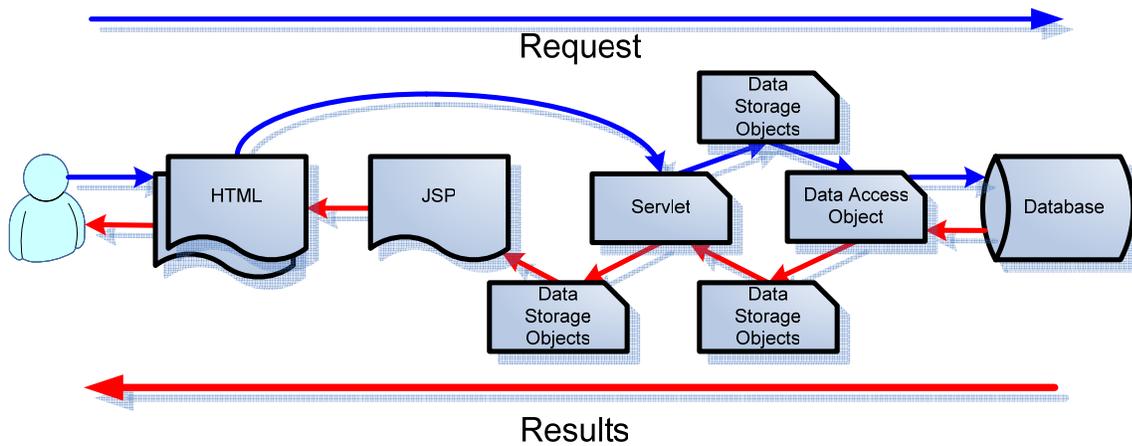
While creating the PM Portal, we made every effort to limit the amount of organizational change required by PM's. By designing the web portal so that it has the same look and feel as the current Niku system, we effectively minimized the amount of training required of our users. Conversely, we also recognized the need to reduce the organization's dependency on their legacy systems in order to allow for more application development efforts. For this reason, we designed the web portal to be independent of the Niku system so that Allmerica will have the ability make substantial changes to their processes if they are so inclined.

5.3.1 Portal Back End

Behind the interface of the Project Management Portal are a number of java classes, servlets, and JSP pages that allow for dynamic content. These components were designed in the Websphere Development Studio 5.1 environment. Using this program allowed for a faster implementation time because it so closely mirrors Allmerica's production environment.

Figure 5.12 shown below gives a high level picture of how the different components worked together to produce an interactive web portal that allowed for data retrieval and storage.

Figure 5-9 Explanation of PM Portal design



5.3.2 Database

In order to allow for the storing of issues, risks, and acceptances on the web, we first had to create tables within the ATS Data Repository to hold this data. The tables that were created to accommodate this function are shown in Appendix J.

The WPDB_ACCEPTANCE, WPDB_ISSUE, and WPDB_RISK tables were created to replicate and build upon the functionality of the current Excel-based acceptance, issue, and risk logs. By storing these logs in a database, results can be easily sorted and searched through and history logs can be kept of which users create and update which WPDB logs.

Additionally, the existing Niku_project, Niku_resource, and Program tables are accessed in order to retrieve information relevant to projects. This information includes a project's project manager, program, Niku number, and project id.

5.3.3 Data Storage Classes

In following with object oriented design, the Issue, Risk, and Acceptance classes were developed in order to represent instances of issue, risk, and acceptance records held in the database. These classes retain the same names and fields as used within the WPDB_RISK, WPDB_ISSUE, and WPDB_ACCEPTANCE tables. Getters and Setters were also set for these three classes in order to facilitate the retrieval and creation of report data. For example, in order to retrieve the due date from an Issue object, the method `issue_name.getDue_dt()` is called. In order to set the information for this field, the method `issue_name.setDue_dt("data goes here")` would be called.

The Project class is very similar in that it represents a single project record in the Niku_project table with the slight difference in that it holds only the attributes that are relevant to the PM Portal while additional fields exist within Niku_project.

5.3.4 Data Access Classes

In order to fill the data storage classes with relevant information, a modification of Allmerica's OracleDataAccess (ODA) class was used. This class is responsible for querying the Oracle database and returning information concerning certain projects, issues, risks, and acceptances. In order to do this, the ODA class relies upon an OracleDataConnection class which manages the connection to the database so that queries can be made.

The OracleDataAccess class consists of 4 groupings of functions that provide similar functionality across the four data storage classes. The ODA's functions allow the returning of a particular issue, risk, acceptance, or project as well as the returning of an array of one of

these report types. For example, another class can call the ODA's `project_getProjectList()` method which returns an `ArrayList` of `Project` classes filled with project information pulled from `Niku_project`. Another function, `issue_getIssue(String Issue_id)`, will return one `Issue` object filled with information from the `WPDB_ISSUE` table referring to the issue record that has a particular `issue_id`.

5.3.5 Servlets

Handling the four main functions of the PM Portal are four Java servlets that accept incoming connections, retrieve information from the ODA, and pass it along to JSP pages for display. These four servlets are named `Issues`, `Risks`, `Acceptances`, and `PMPortal`.

Because each servlet is designed to handle more than one type of request from the user, a variable called "action" is used throughout each servlet in order to determine what type of request is being made. A series of `if/else` statements then call the corresponding function based on the action to be taken. For example, if a user is looking at the list of projects and clicks on the "Issues" link for a particular project, a `get` request is sent to the "Issues" servlet with the parameter: "action=get_project_log" and "project_id=500043". The `Issues` servlet then understands that a request is being made to view the issue logs for a particular project. Once this is understood, the correct function can be called.

Another example would be if someone wanted to sort by the `due_dt` field by clicking on a field label while looking at a list of issues. Here a `get` request would be sent to the `Issues` servlet with "action=sort" and "order_by=due_dt" parameters which would then handle the request by calling the `sort` function.

5.3.6 JSP Pages

The requests that are sent to the servlets are processed and dispatched to one of four JSP files which in turn create readable HTML from varying java objects. For example, after a user has clicked on a specific issue so that it may be edited, the request goes to the servlet which calls upon the ODA to retrieve the issue information. The issue's information is then passed back up from the ODA to the servlet, and finally dispatched to the JSP. The JSP then takes this Issue object and places the varying attributes throughout the "edit" section of the issues page using code similar to this:

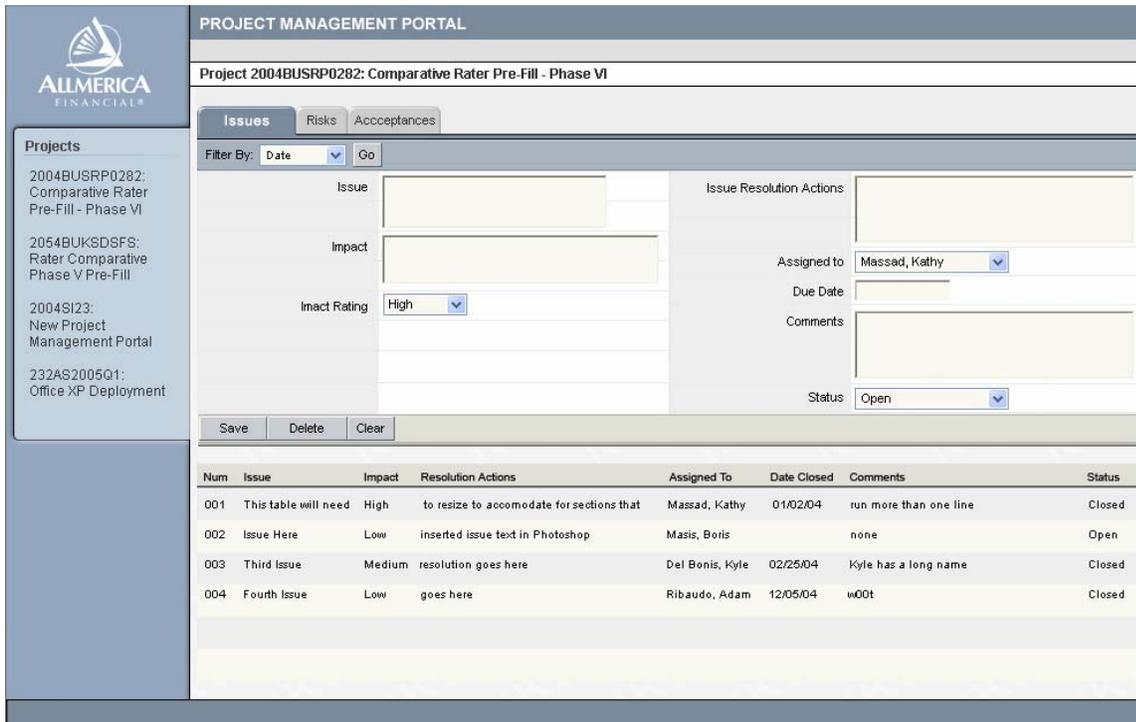
```
<%=issue_edit.getIssue_nbr()%>
```

This code is then rendered by the web server to read as the number of the issue.

5.3.7 Graphic Design

While developing our web interface, we needed a program that provided us with the flexibility of laying out the page regardless of any constraints. For this reason, we chose to use Adobe Photoshop to develop a mockup of our web portal. While taking into account existing company guidelines and the current Niku layout, we made use of layers and various design elements provided by Photoshop, and presented our project stakeholders with a mockup (shown below). Once our design was complete and approved, we sliced the image into pieces that could be easily exported from Photoshop into HTML tables that formed the beginnings of our web-interface.

Figure 5-10 Project Log Portal Mockup



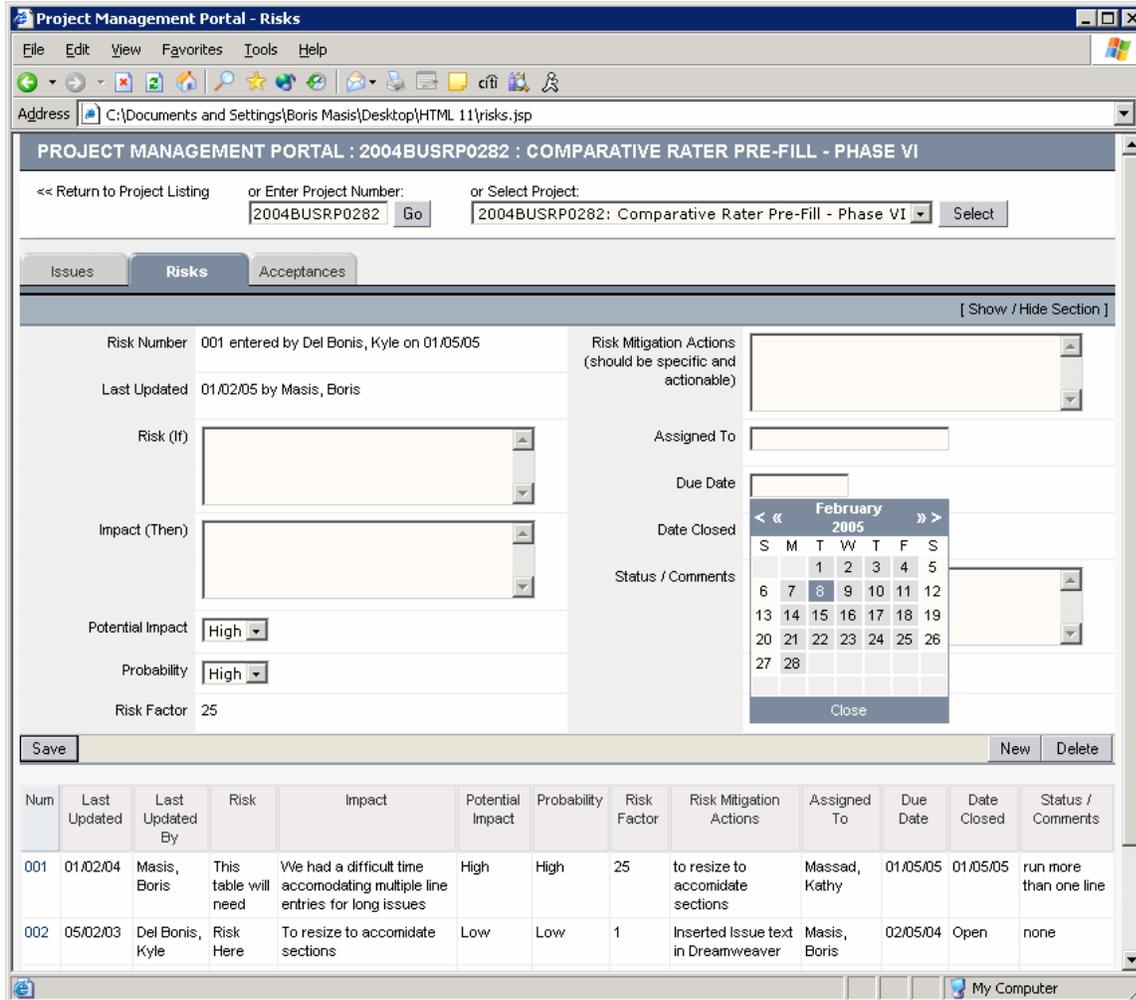
5.3.8 HTML Layout

Macromedia DreamWeaver was used to complete the HTML layout of the PM Portal. DreamWeaver is an industry-standard HTML editor and proved to be an indispensable tool. The “Issues,” “Risks,” and “Acceptances” content pages are composed of three primary tables, a top table containing navigation, a middle table which allows for data manipulation, and a bottom data grid. All styles and colors on the pages are handled to an external CSS style sheet, and the only images used on the page are those for the active and inactive tabs.

We believe the achieved design to be both attractive and functional. A base page size of about 13kb means that the pages can be loaded very quickly. Even users connecting though VPN connections over dial-up modems should be able to download the page content

in a matter of seconds. The finalized portal design pictured below is very similar to the original mockup with a few notable differences.

Figure 5-11 Final Project Log Portal “Risks” page

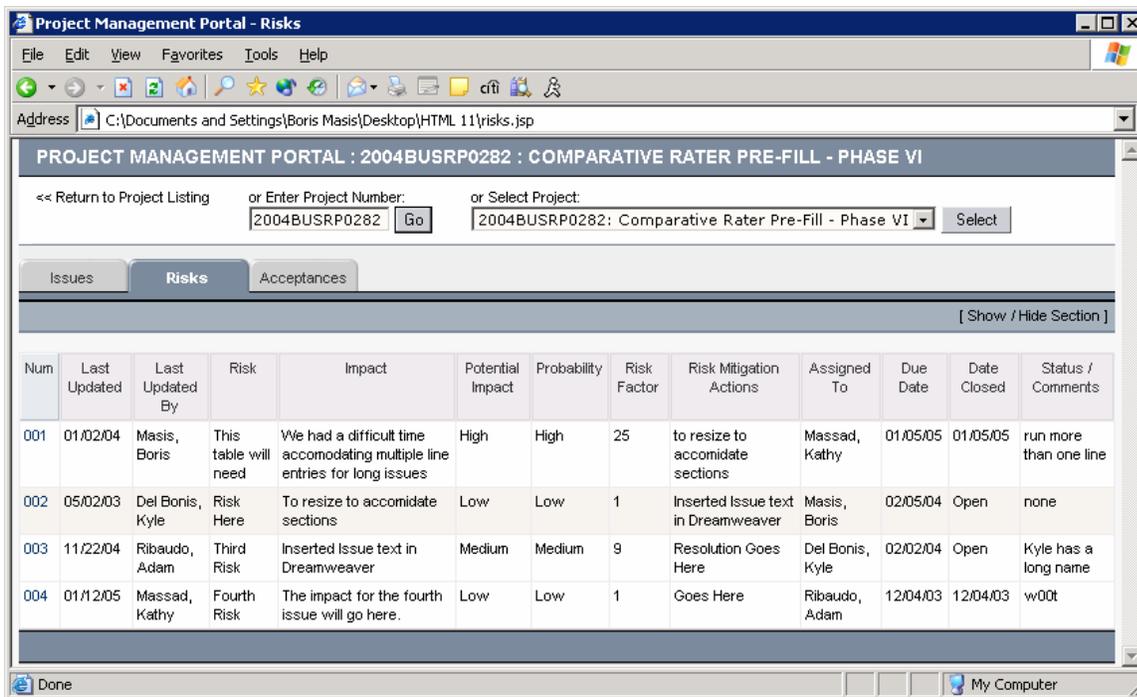


Most noticeably, the left navigation panel shown in the Photoshop mockup has been removed. A top table, which allows for quick project selection has been added in its place. In addition, an index page allowing for initial project selection has been added. This page will be discussed further on.

Several user convenience features have been added to the pages. A calendar popup (shown in previous screenshot) appears whenever a user clicks on a field where date entry is required. This calendar allows for a visual way to select appropriate dates and ensures for proper date formatting. Additional JavaScript error checking was also implemented to ensure that the date field is properly formatted.

A “[Show / Hide Section]” link was added to the top right of the page. This link allows a user to collapse the middle data entry table and receive a grid view for convenient printing as shown below.

Figure 5-12 “Risks” page after clicking the “[Show / Hide Section]” link



A JavaScript confirmation prompt was also built into the pages. Specifically, a user clicking on the “Delete” button is asked “Are you sure you want to delete the selected

entry?” These convenience features ensure that a Project Manager has a smooth and pleasurable experience utilizing the PM Portal.

5.4 User Testing

Testing was conducted throughout the last three weeks of the project in order to leave time for changes to the system and for implementation delays. Testing involved members of the MQP group working together in pairs with various project managers to test the functionality of the system. The test scenarios used for both the Weekly and Monthly Status Worksheet and the Project Log Web Portal are shown in Appendix H.

Once testing was completed, we gathered feedback from project managers and made the most valuable and feasible changes to the system. The system testing, along with feedback from project managers, is what allowed us to design an optimal project reporting system. This testing was conducted with six project managers and two representatives from the Project Management Office. It was these project managers that were able to help us identify both functionality flaws and areas for improvement. During the time of the testing, the portal had some dead links, and the wrong cells were being populated in the Scheduling section of the workbook. We also encountered some issues with a few of the test subjects in running the PRS, because the oracle client was not deployed on all of our user’s systems. We were able to correct the flaws, and obtain some feedback on the functionality as well. One project manager suggested that “Change management would be a great thing to automate”, which we see as a possible recommendation for the future of this system. Some other suggestions for the workbook included the addition of a drop down box for selecting Niku Numbers, and the separation of BASD and ATS hours in combined projects in the

Dashboard. For the portal, the concept of validation was raised as a concern among users. Users also expressed concern regarding the need for tangible proof of approval, which we have added as part of our recommendations. The project managers also gave us a few suggestions regarding the portal layout, particularly that of the JavaScript calendar for selecting dates. Most PM's encountered some difficulties in closing the popup calendar when they accidentally activated it. Their first instinct was to click on the white space in on the webpage, however the only method to close the calendar is to click a "close" link, which turned out not to be visible to most PM's. In some cases, the "close" link was only visible when the PM scrolled down the webpage, and in other cases, it blended in with the bottom of the Internet Explorer bar, making it hard to find. For the calendar, one PM recommended making it appear higher if possible, to solve the issue of making the "close" link more visible, and another PM actually stated that he preferred a manual data entry method.

Many suggestions for field name changes in the portal, such as changing "Project Number" to "Niku Number", and "Status/Comments" to "Comments" were also taken into consideration, and incorporated into the final version of our Project Management System. All suggestions are documented in Appendix I, with an asterisk (*) to denote suggestions that led to changes. Other suggestions are included in our recommendations.

5.5 Implementation

We discovered during the final weeks of our project that the PMO did not expect to fully implement our system but rather to move it to Allmerica's User Acceptance Testing (UAT) environment. This was decided for a number of reasons including the time requirements necessary to move a set of webpages from UAT to production and the PMO's

need to finalize the contents of the Weekly Status Report and Monthly Dashboard report. We were however able to move the tables we created for the PM Portal into a production environment. The changes that we recommend to complete the implementation of the PRS are noted in section 6.3.

6. Recommendations

It is our belief that the Project Reporting System will add value to Allmerica's business processes by reducing the amount of time project managers are required to spend completing monthly and weekly reports and by creating structured data repositories for project information. However, the PRS is a complex system that has much room to grow. Below are our recommendations concerning actions that could be taken to ensure a successful implementation of the PRS and to augment its existing functionality. More technical recommendations and maintenance topics are provided in our system administration documentation (Appendix G).

6.1 Workbook

In analyzing the functionality of the reporting workbook before, during, and after our automation of it, our team has realized much of the potential of such a source of reporting and what types of functionality it has the capacity to provide. Based on what we have learned in this development process there are a number of recommendation we can make about the future use and enhancement of this tool.

First, we recommend the movement of the current SQL commands used for buttons and dropdowns into Oracle views in the ATS Data Repository database. Storing SQL queries as views will ensure that if any SQL code needs to be changed, a change can be done on the server, as opposed to on all the client workbooks. In addition, the file size of the individual reports will decrease, and the speed of query execution will increase as queries stored in views are compiled and optimized.

Next, we recommend looking into automation of other sections in the workbook. The sections which we have automated were chosen after careful analysis, and we believe they will bring a lot of benefit to the organization. However, a number of other workbook sections can also stand to be automated. Now that the groundwork for an expandable and tested system has been laid, we encourage Allmerica to consider the migration of other data into systems that can be automated by utilizing the approach developed in this MQP. Finally, we also recommend the consideration of a complete re-engineering of the reporting platform. Excel, albeit a suitable reporting tool, is not as reliable and capable as other options. Excel is able to offer database connectivity and interactive functionality, but not without flaws and imperfections, especially regarding maintenance and accessibility. We suggest that Allmerica consider utilizing a commercial reporting platform, possibly one that is web based and similar to the PM Portal. This would provide a solution which is much more robust, competent, scalable, and maintainable.

6.2 PM Portal

The creation of the PM Portal has introduced a new medium for project information entry for Allmerica's Project Managers. Entering Issues, Risks, and Acceptances via the web was something that our testing pool of project managers seemed willing to accept with enthusiasm; however, improvements can still be made.

Most importantly is the issue of security. Currently, the PM Portal allows any Allmerica employee to alter the contents of a project's issues, risks, and acceptances without any explicit authorization. This level of security was requested by the PMO, however, to

increase security and data integrity we recommend the development of a system to authorize certain users for certain projects only.

Lastly, some test users were concerned about the need for tangible approval of items such as acceptances. Users wanted to be able to consult some sort of record that proves an item was changed or issued correctly and appropriately to complement what they see on the PM Portal. This could be addressed by a number of possible solutions, such as an automated email system, or some other sort of electronic validation records which can be documented and referenced.

The ability to print the information on the portal pages has also been noted as important by our test pool of users. Current functionality allows the user to collapse all input fields to show only the list of entered items and then print them. Additional features could be developed that reorganize the information into a more printer friendly format, via as a 'print view' button. Other functionality, such as a button that will allow these items to be exported to Excel or sent to a colleague may also be included.

Lastly, some users were concerned with the PM Portal's inability to elevate risks to issues. Current functionality only allows for the addition, editing, and deletion of risks and issues to a project. In the case of a risk becoming an issue, one would have to delete the risk and re-enter it as an issue. The option of developing functionality to 'upgrade' a risk to an issue is something that would enhance the usability and usefulness of the system and should be considered in future versions of the PM Portal.

6.3 Implementation

As mentioned in section 5.5, we were unable to completely implement our system within Allmerica's production environment. However, we do have recommendations concerning the process Allmerica should take to ensure that the project reporting system is successfully incorporated into the company's existing business processes.

At the time of this report's completion, the PM Portal exists within Allmerica's user acceptance testing (UAT) environment, the database tables reside in Allmerica's production environment, the testing section of the automated workbook requires additional debugging from the Howell team, the weekly status report needs revision from the PMO to incorporate their "combined" approach, and the dashboard report requires a decision from the PMO on how to represent the testing section. Assuming that these tasks are completed and thoroughly tested, the automated workbook and PM Portal will be ready for final implementation within Allmerica. What would remain would be the execution of a training plan, the incorporation of the project reporting system into Allmerica process documentation, and the creation of a maintenance plan.

6.4 Training

The PRS was designed from the beginning to minimize the amount of organizational change necessary for its implementation. Its automation of report procedures is in a very intuitive manner and its ability to add issues, risks, and acceptances over the web was built keeping the same field names as the original excel-based logs. Additionally, user manuals

(Appendix F) were provided to the PMO for distribution to relevant PM's. It is for these reasons that training PM's on the use of the PRS should be minimal.

Up to 75 PM's could be affected by the implementation of the PRS. What we recommend would be for the PMO to conduct hour long sessions with 20 PM's at a time where an instructor would go over the basics of the PRS including the insertion of new issues, risks, and acceptances along with their retrieval from within the automated workbook. During these sessions, user manuals could be distributed in order to provide a reference for future interactions with the PRS. Lastly, instructors could offer half-hour one-on-one sessions if any users still experience problems.

It would be important for instructors to note during these sessions that the PRS relies on information provided by the user to the Niku system. This means that if a user is not using Niku correctly, then the PRS will not retrieve project information correctly. An example of incorrect use that would result in erroneous data would be the renaming of project plan phases from the template supplied to them by the PMO. Once these phases are renamed, the PRS will not recognize them and will not be able to automate their retrieval.

7. Conclusions

Our project set out to save the valuable time of project managers by automating certain business processes. We believe that we have done exactly that and much more. We provided more than the capability to pull data into reports without pulling from multiple documents; we created incentive for project managers to strictly follow Allmerica's project plan standards. We created more than just a web interface to allow the storage of project logs; we provided an opportunity for project managers to see the advantages of storing information in structured formats, making them more receptive to organizational changes in that direction. Lastly, we changed more than the structure and consolidation of a report through communications with a remote team; we changed the functional requirements of another team's project to better suit the needs of Allmerica's project managers.

We believe that the system we have provided to Allmerica is a useful one and hope that its implementation is carried through. Regardless of the status of our system, we have found the information and experiences gained through this project to be invaluable. Throughout the life of this project we have learned new VB and Java programming techniques, designed and implemented database elements, managed communications with multiple people holding multiple roles, conducted interviews and user tests, developed and administered surveys, and documented relevant decisions and results for both WPI and Allmerica.

WPI's 2004-2005 Undergraduate Catalog defines the MQP as a project which applies the "skills, methods, and knowledge of the discipline to the solution of a problem that would be representative of the type to be encountered in one's career." Respectively, we feel that this project has not only fulfilled, but surpassed these criteria. By providing us with an

opportunity to develop solutions to real-life business problems, not only have we become more competent and capable in our field but we have also gained the experience and confidence necessary to carry ourselves forward into the professional workforce.

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Appendix A Glossary

ATS	Allmerica Technology Services
BASD	Business Automation Strategy & Delivery
CMM	Capability Maturity Model
CPI	Continuous Process Improvement
ERD	Entity Relationship Diagram
HTML	HyperText Markup Language
IP	Investment Proposal
JSP	Java Server Pages
MQP	Major Qualifying Project
ODA	Oracle Data Access
OLE	Microsoft Object Linking and Embedding
OO4O	Oracle Objects for OLE
PAL	Process Asset Library
PM	Project Manager
PMO	Program Management Office
PRAM	Project Risk Assessment Method
QA	Quality Assurance
SEPG	Software Engineering Process Group
SME	Subject Matter Expert
SOW	Statement of Work
SQA	Software Quality Assurance
SQL	Structured Query Language
UAT	User Acceptance Testing
VBA	Visual Basic for Applications
WPDB	Work Products Database
WPI	Worcester Polytechnic Institute

Appendix B Capability Maturity Model

The Capability Maturity Model (CMM), developed by the Software Engineering Institute of Carnegie Mellon in 1986, has been used by many organizations to identify best practices which would help them increase the effectiveness and maturity of the processes. It serves as a framework that describes the key elements of a successful process, as well as providing a foundation for continual improvement. The CMM describes the maturing movements from ad-hoc processes, to incredibly detailed, self-maintaining processes.

Applicable to areas such as planning, engineering, and managing development and maintenance activities, when followed closely, CMM practices enhance an organizations ability to meet goals for cost, schedule, functionality and product quality. Ultimately, CMM is responsible for improving efficiency, return on investment, and overall effectiveness.

The CMM is currently regarded as an index by which organizations can measure their process efficiency and also compare it to the state of the art practices in their industry. In addition, it allows organizations to identify flaws within their current processes as well as a means to prioritize, improve, and evaluate them. This is made possible by the separation of 5 distinct levels of maturity detailed in table C.1.

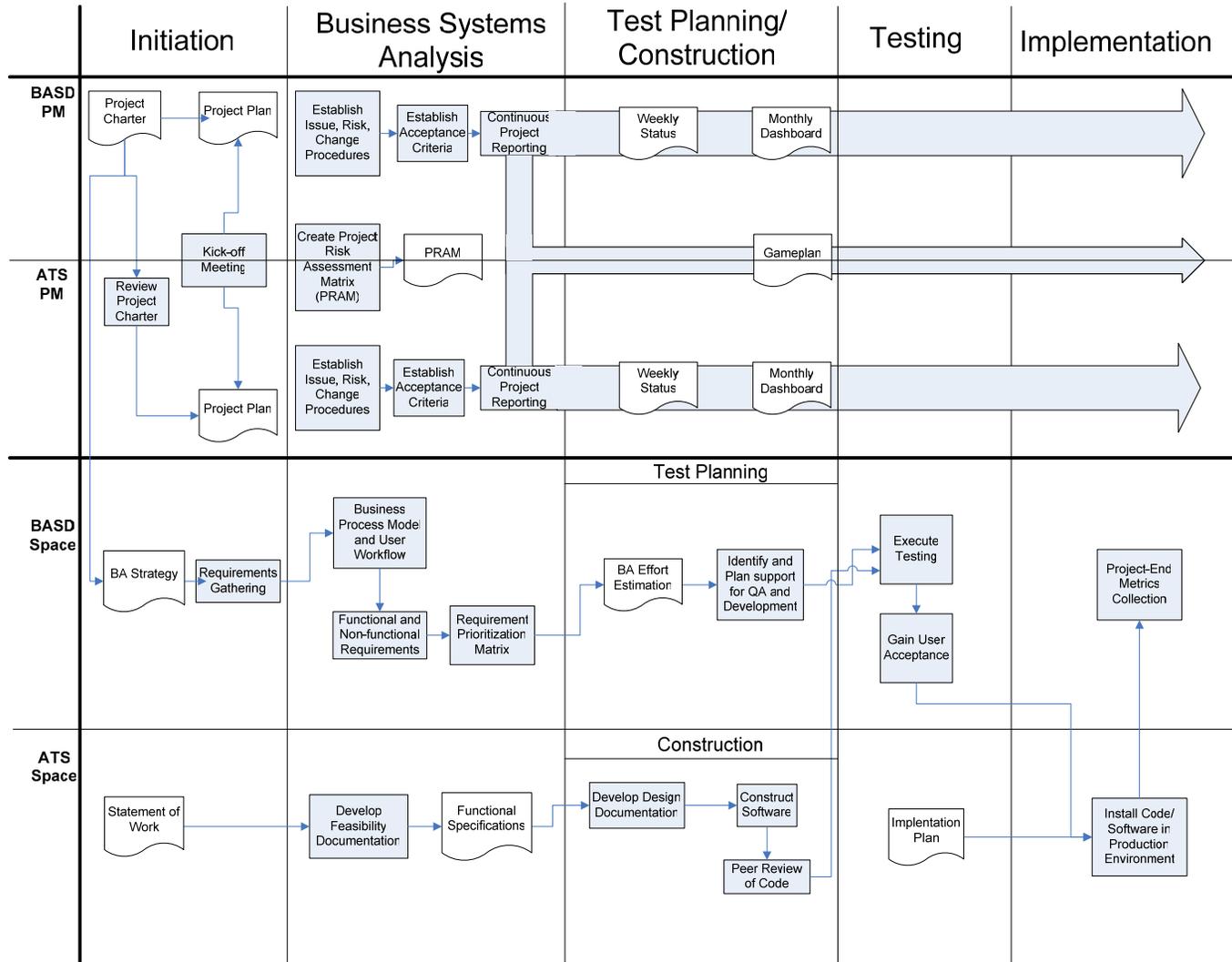
Table B-1 – Process Areas by Maturity Level

<p>Level 1-2 (Repeatable)</p> <ul style="list-style-type: none"> - Configuration Management - Quality Assurance - Subcontract Management - Project Tracking and Oversight - Subcontract Management - Project Planning - Requirements Management
<p>Level 3 (Defined)</p> <ul style="list-style-type: none"> - Peer Reviews - Intergroup Coordination - Product Engineering - Integrated Software Management - Training Program - Organization Process Definition - Organizational Process Focus
<p>Level 4 (Managed)</p> <ul style="list-style-type: none"> - Quality Management - Process Measurement and Analysis
<p>Level 5 (Optimizing)</p> <ul style="list-style-type: none"> - Process Change Management - Technology Change Management - Defect Prevention

Levels 1-2 are considered a disciplines process; levels 2-3 are considered the standard consistent process; levels 3-4 are considered the predictable process; and level 4-5 are considered the continuously improving process.

CMM has since become the de-facto industry standard for analyzing and improving business practices worldwide. It is the only model that effectively measures the maturity of processes that is adaptable horizontally throughout almost any industry. Currently, the CMM has been adopted and used by the US Government, commercial and business industry, and academia.

Appendix C ATS and BASD Project Workflow



Appendix D Project Reporting Sources

Primary Data Sources	ID	Format	Notes
Niku Project Plan	1		Time scale param / workbench component
Niku Time Recording	2		Time scale param / workbench component
ABC Reports (Fin.)	3	Excel	Time scale param
Retain (Resource Plans)	4	Excel	
PRAM (Proj. Risk Asses. Matrix)	5	Excel	located in WPDB / same wkbk as issue logs / leverage across ATS & BASD
Issue Logs	6	Excel	located in WPDB / same wkbk as PRAM / leverage across ATS & BASD
Acceptance Logs	7	Excel	located in WPDB / leverage across ATS & BASD
Test Director	8		Part of Mercury Suite
test statistics	8a		
test defects	8b		
peer review	8c		
Lotus Notes (RMPO)	9		

Secondary Data Sources	ID	Format	Notes
Project Status Report	10	report	weekly status report / discretionary
Baseline Status Report	11	report	weekly status report / baseline
Gameplan	12	report	monthly status report / discretionary
Project Dashboard	13	report	monthly project revisions

Report	Frequency	Origin	ATS		BASD		Combined	
			Data Sources	Format	Data Sources	Format	Data Sources	Format
Weekly Status Report	Weekly	PM	1, 5, 6, 7, 8	Word	1, 5, 6, 7, 8a, 8c	Excel	1, 5, 6, 7, 8a, 8c	Excel
Project Dashboard	Monthly	PM	1, 2, 4, 5, 6, 8a-c	Excel	1, 2, 4, 5, 6, 8a-c	Excel		
Baseline Status Report	Weekly	PM			2, 3, 5, 6, 12	Excel		
Gameplan (IP)	Monthly	PM					3, 5, 6	Lotus Notes
Baseline Dashboard	Monthly	PM			2, 3, 12, 13	Excel		
Focus Goal #5 (IP)	Monthly	PM						Lotus Notes
Watchlist	Monthly	PMO					11	

Appendix E WPI-Allmerica Project Survey

Dear ATS/BASD Project Manager,

I am part of a group of WPI students working on a project in conjunction with the Allmerica PMO. We are looking at ATS and BASD project management reporting procedures and have a few questions that will help us define the state of Allmerica PM reporting today. These questions should take only 5-10 minutes of your time and will be of tremendous help to our project. The answers will be kept anonymous when used in our presentations and papers. Please follow the instructions below and submit your answers by October 13th.

1. Press "reply"
2. Delete the contents of the "to:" field above and add aribaudo@allmerica.com
3. Scroll down and enter your answers next to arrows at the end of each question.
4. Click "send"

Thank you for your cooperation,
WPI-Allmerica '04 project team

Questions

1. How many projects do you currently manage? ->
2. What is the maximum number of projects you have ever managed at one time? ->
3. How many minutes, on average, does it take you to complete each of the following reports...
 - a. Weekly status report ->
 - b. Monthly dashboard report- >
 - c. Gameplan ->
4. How many minutes, on average, does it take you to complete each of the following sections on the Monthly Dashboard report?
 - a. Schedule ->
 - b. Budget ->
 - c. Risks/Issues ->
 - d. Defects ->
 - e. Scope/Requirements ->
 - f. Resources ->
5. Please provide any comments you may have concerning the state of ATS/BASD project management reporting today. ->

Appendix F Project Reporting System User Manual

1. Introduction

Welcome to the user manual for the Project Reporting System. In the following pages you will find instructions for utilizing the web based PM Portal, as well as the automated BASD/ATS Weekly Status and Dashboard reports.

1.1 Purpose

This Users Manual describes how project managers within ATS and BASD can utilize the automated Combined Weekly Status Report and Combined Monthly Dashboard along with the PM Portal to track progress on open projects.

This manual provides guidance as to the how to navigate the system effectively from a project managers perspective using a question and answer format.

2. The Project Log Web Portal

2.1 Description

The Project Log Web Portal allows project managers and team members to input data currently stored in the PRAM and acceptance logs via a web-based interface. Project managers and project team members will be able to log into the Project Log Web Portal via the existing LDAP verification process and will have the ability to view, enter, and modify data concerning issues, risks, and acceptances.

2.2 Getting Started

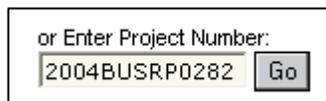
2.2.1 *How do I access the system?*

To access the web portal, you must first navigate to the url printed at the top of this page where you will be prompted to log in. To log in you must enter your LAN ID and password, and click the “Log in” button.

2.2.2 *How do I find my project?*

There are two ways to select a project:

- On the top left of the page, there is a textbox labeled “Enter Project Number.” If you know your project number, type it in and then click the button labeled ‘Go’.



A screenshot of a web form. At the top, it says "or Enter Project Number:". Below this is a text input field containing the project number "2004BUSRP0282". To the right of the input field is a button labeled "Go".

- If you do not know your project number, on the top right of the page, there is a drop down list box of all active projects within the organization. They are listed in order of Project Number, which includes date, Niku number, and the project’s title. To select your project scroll down the list and highlight and click on your project when you see it. Then, click the button to the left labeled ‘Select’.

or Select Project:

2004BUSRP0282: Comparative Rater Pre-Fill - Phase VI

2.2.3 How do I navigate between the Issues, Risks, and Acceptance pages?

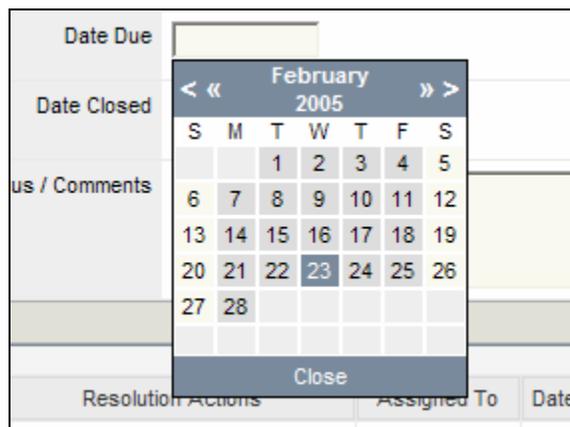
Under the Project Selection drop down box, there are three tabs labeled Issues, Risks, and Acceptances, respectively. To switch from the Issues page to the risks page, click once on the Risks tab. To switch to the Acceptances page, click once on the Acceptances tab. To navigate back to the Issues page, click on the Issues tab.



2.3 The Issues Page

2.3.1 How do I add a new Issue?

To add a new issue, click on the button below the form. Complete the form by typing the issue, impact, resolution action, who the project has been assigned to, its due date, its close date, and comments. To enter the 'Due Date' and the 'Date Closed', simply click on the text field to bring up a calendar in order to select the date.



To rate the impact, click once on the drop down box labeled 'Impact Rating' and select the rating that best describes your issue.

Impact Rating

2.3.4 How do I know my Issue has been saved?

Upon clicking the button, information that has been entered will appear in a table of Issues at the bottom of the page, with a column displaying the name of the creator, and the creation date.

2.3.5 How can I make changes to my issue after it has been submitted?

By clicking on the Issue Number in the table at the bottom of the page, the Issue and all of its data will appear in the form, where it can be modified. After making modifications, simply click the

Save button again, and refer to the 'Last Updated' column in the table at the bottom of the page for confirmation of the save.

2.3.6 How do I delete an old issue that I want removed?

To delete an issue from your records, open the issue by clicking on the Issue Number in the table at the bottom of the page, and then clicking the **Delete** button once. You will then be prompted to either click OK to proceed with the delete, or Cancel to not proceed.

2.3.7 How can I print out a list of all the Issues for my project?

To hide the entry form and display only the Issues, table, click once on the 'Show/Hide Section' which is directly above the form, to the right. You can now print the page in landscape mode.

PROJECT MANAGEMENT PORTAL : 2004BUSRP0282 : COMPARATIVE RATER PRE-FILL - PHASE VI											
<< Return to Project Listing		or Enter Project Number: 2004BUSRP0282 Go			or Select Project: 2004BUSRP0282: Comparative Rater Pre-Fill - Phase VI Select						
Issues											[Show / Hide Section]
Num	Last Updated	Last Updated By	Issue	Impact	Impact Rating	Resolution Actions	Assigned To	Date Due	Date Closed	Status / Comments	
001	01/02/04	Masis, Boris	This table will need	We had a difficult time accomodating multiple line entries for long issues	High	to resize to accomidate sections	Massad, Kathy	01/05/05	02/05/04	run more than one line	
002	05/02/03	Del Bonis, Kyle	Issue Here	To resize to accomidate sections	Low	Inserted Issue text in Dreamweaver	Masis, Boris	02/05/04	02/02/04	none	
003	11/22/04	Ribaudo, Adam	Third Issue	Inserted Issue text in Dreamweaver	Medium	Resolution Goes Here	Del Bonis, Kyle	02/02/04	12/04/03	Kyle has a long name	
004	01/12/05	Massad, Kathy	Fourth Issue	The impact for the fourth issue will go here.	Low	Goes Here	Ribaudo, Adam	12/04/03	01/05/05	w00t	

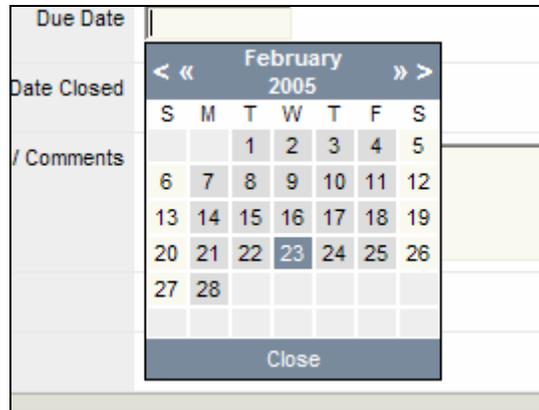
2.3.8 How can I sort the issues by who they are assigned to, or the date they were closed?

To sort by any of the fields in the table of Issues, click on the column header once to sort in ascending order.

2.4 The Risks Page

2.4.1 How do I add a new Risk?

To add a new risk, click on the **Enter New Risk** button below the form. Complete the form by typing the risk, impact, risk mitigation actions, who the project has been assigned to, its due date, close date, and comments. To enter the 'Due Date' and the 'Date Closed', simply click on the text field to bring up a calendar in order to select the date.



To rate the potential impact, and probability, click once on the drop down box labeled 'Impact Rating' and select the rating and probability that best describes your Risk.

The image shows two dropdown menus. The first is labeled 'Potential Impact' and has 'High' selected. The second is labeled 'Probability' and also has 'High' selected.

2.4.2 How do I know my Risk has been saved?

Upon clicking the **Save** button, information that has been entered will appear in a table of Risks at the bottom of the page, with a column displaying the name of the creator, and the creation date.

2.4.3 How can I make changes to my Risk after it has been submitted?

By clicking on the Risk Number in the table at the bottom of the page, the Risk and all of its data will appear in the form, where it can be modified. After making modifications, simply click the **Save** button again, and refer to the 'Last Updated' column in the table at the bottom of the page for confirmation of the save.

2.4.4 How do I delete an old Risk that I want removed?

To delete a Risk from your records, open the Risk by clicking on the Risk Number in the table at the bottom of the page, and then clicking the **Delete** button once. You will then be prompted to either click OK to proceed with the delete, or Cancel to not proceed.

2.4.5 How can I print out a list of all the Risks for my project?

To hide the entry form and display only the Risks, table, click once on the 'Show/Hide Section' which is directly above the form, to the right. You can now print the page in landscape mode.

PROJECT MANAGEMENT PORTAL : 2004BUSRP0282 : COMPARATIVE RATER PRE-FILL - PHASE VI												
<< Return to Project Listing			or Enter Project Number: 2004BUSRP0282 <input type="button" value="Go"/>			or Select Project: 2004BUSRP0282: Comparative Rater Pre-Fill - Phase VI <input type="button" value="Select"/>						
Issues			Risks			Acceptances						
[Show / Hide Section]												
Num	Last Updated	Last Updated By	Risk	Impact	Potential Impact	Probability	Risk Factor	Risk Mitigation Actions	Assigned To	Due Date	Date Closed	Status / Comments
001	01/02/04	Masis, Boris	This table will need	We had a difficult time accomodating multiple line entries for long issues	High	High	25	to resize to accomidate sections	Massad, Kathy	01/05/05	01/05/05	run more than one line
002	05/02/03	Del Bonis, Kyle	Risk Here	To resize to accomidate sections	Low	Low	1	Inserted Issue text in Dreamweaver	Masis, Boris	02/05/04	Open	none
003	11/22/04	Ribaudo, Adam	Third Risk	Inserted Issue text in Dreamweaver	Medium	Medium	9	Resolution Goes Here	Del Bonis, Kyle	02/02/04	Open	Kyle has a long name
004	01/12/05	Massad, Kathy	Fourth Risk	The impact for the fourth issue will go here.	Low	Low	1	Goes Here	Ribaudo, Adam	12/04/03	12/04/03	w00t

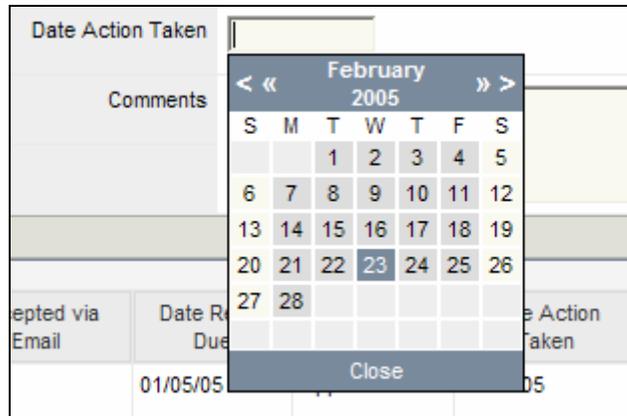
2.4.6 Can I sort the Risks by who they are assigned to, or the date they were closed?

To sort by any of the fields in the table of Risks, click on the column header to sort in ascending order.

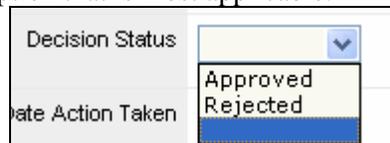
2.5 The Acceptances Page

2.5.1 How do I add a new Acceptance?

To add a new Acceptance, click on the button below the form. Complete the form by typing the Deliverable Name and Description, the Approver's Name, the Date Submitted, the Date Reply Due, the Date Action Taken, and comments. To enter the 'Date Submitted', the 'Date Reply Due', and the 'Date Action Taken', simply click on the text field to bring up a calendar in order to select the date.



To enter the 'Decision Status', and whether it was 'Accepted via Email' click once on the drop down boxes and select the option that is most applicable.



2.5.2 How do I know my Acceptance has been saved?

Upon clicking the **Save** button, information that has been entered will appear in a table of Acceptances at the bottom of the page, with a column displaying the name of the creator, and the creation date.

2.5.3 How can I make changes to my Acceptance after it has been submitted?

By clicking on the Acceptance Number in the table at the bottom of the page, the Acceptance and all of its data will appear in the form, where it can be modified. After making modifications, simply click the **Save** button again, and refer to the 'Last Updated' column in the table at the bottom of the page for confirmation of the save.

2.5.4 How do I delete an old Acceptance that I want removed?

To delete an Acceptance from your records, open the Acceptance by clicking on the Acceptance Number in the table at the bottom of the page, and then clicking the **Delete** button once. You will then be prompted to either click OK to proceed with the delete, or Cancel to not proceed.

2.5.5 How can I print out a list of all the Acceptances for my project?

To hide the entry form and display only the Acceptances, table, click once on the 'Show/Hide Section' which is directly above the form, to the right. You can now print the page in landscape mode.

PROJECT MANAGEMENT PORTAL : 2004BUSRP0282 : COMPARATIVE RATER PRE-FILL - PHASE VI										
<< Return to Project Listing		or Enter Project Number: 2004BUSRP0282 Go		or Select Project: 2004BUSRP0282: Comparative Rater Pre-Fill - Phase VI Select						
Issues		Risks		Acceptances					[Show / Hide Section]	
Num	Last Updated	Last Updated By	Deliverable Name and Description	Approver's Name	Date Submitted	Accepted via Email	Date Reply Due	Decision Status	Date Action Taken	Comments
001	01/02/04	Masis, Boris	Business & Functional Spec	Massad, Kathy	02/05/04	Yes	01/05/05	Approved	01/05/05	run more than one line
002	05/02/03	Del Bonis, Kyle	Functional Spec Checklist	Masis, Boris	02/02/04	No	01/05/05	Rejected	02/05/04	none
003	11/22/04	Ribaudo, Adam	Architectural and Utilities Planning Review	Del Bonis, Kyle	12/04/03		02/05/04	Approved	02/02/04	Kyle has a long name
004	01/12/05	Massad, Kathy	Technical Specs	Ribaudo, Adam	12/04/03	Yes	12/04/03	Rejected	12/04/03	w00t

2.5.6 How can I sort the Acceptances by who they are assigned to, or the date they were closed?

To sort by any of the fields in the table of Acceptances, click on the column header to sort in ascending order.

3. Automated Workbook

The automated Combined Status and Dashboard Workbook allows project managers the opportunity to automatically populate sections of their reports with data that is stored in their NIKU project plans as well as the PM Portal's Issues, Risks, and Acceptance pages.

3.1 Getting Started

3.1.1 How do I use the automated workbook?

The automation of the workbook is facilitated through the gathering of information based on a unique project identifier known as the “NIKU number”. This number can be found when opening your project plans within Niku workbench and is also normally listed on your Weekly Status Report. With this number, you have access to the automation functionality mentioned in the following “Combined Weekly Status Report” and “Combined Dashboard” sections.

In addition, you may be prompted to enable or disable macros upon opening the workbook. In order to make use of the automation functionality you must enable the macros.

NIKU/RMPO Number: <input type="text" value="2003PRJRP0034"/> <input type="button" value="Populate"/>

3.1.2 How do I navigate between reports?

At the bottom of the workbook there are a set of tabs labeled ‘FRONT’, ‘Combined Status Report’, and ‘Combined Dashboard’. Clicking on any of these will bring you to the respective worksheet.

FRONT	Combined Status Report	Combined Dashboard
-------	-------------------------------	--------------------

3.2 Combined Weekly Status Report

3.2.1 What does the ‘Populate’ button in the Project Information Section do?

The populate button for this section will automatically fill in the ‘Project Name’ and the ‘IP Name’ and ‘IP number’ fields if they are stored in the ATS Repository. If any of these items are not filled in after pressing the “populate” button, it is most likely that your project’s information has not been completely entered into the ATS Data Repository.

PROJECT INFORMATION		Business Partners:	
NIKU/RMPO Number:	<input type="text" value="2003PRJRP0034"/> <input type="button" value="Populate"/>	Current Phase:	<input type="text" value="Project Initiation"/>
Project Name:	<input type="text" value="Operations Optimization"/>	Period Ending:	<input type="text" value="10/23/04"/>
BASD PM:	<input type="text" value="Gibbs, Rhett"/>	IP Name:	<input type="text" value="PL Underwriting & POS Efficiencies"/>
ATS PM:	<input type="text" value="Miner, Gretchen"/>	IP Number:	<input type="text"/>

3.2.2 How do I populate issues/risks from information I entered into the PM Portal?

The dropdowns under the ‘Description’ column of the “issues/risks” section become populated with the projects current Issues and Risks when the dropdown arrow is clicked. After an issue or risk is chosen from the list, the corresponding ‘Resolution Plan’ and ‘Target Date’ cells are populated if the data exists in the Risk or Issue page for your project in the PM Portal.

ISSUES/RISKS		
Description	Resolution Plan	Target Date
Unfamiliar with application	User Training	2/2/2005

3.2.3 How do I populate the “Scheduling” section?

The populate button for this section will fill in the ‘Planned Start Date’, ‘Actual/Est Start Date’, ‘Planned Completion Date’, ‘Actual/Est. Completion Date’, and ‘Status’ fields for each ‘Major Deliverable / Milestone’.

If a milestone or deliverable is not populated with dates that are in your project plan it is likely that there is a discrepancy between the naming of the phases in your project plan and the naming of these phases as listed in the status report. Changing the names of the milestones and deliverables in your project plan to match the standardized ones in the status report will fix this problem.

PROJECT / DELIVERABLE SCHEDULE STATUS		Populate			
(should come from NIKU Workplan)					
Major Deliverable / Milestone ^a	Planned Start Date	Actual/Est. Start Date	Planned Completion Date	Actual/Est. Completion Date	Status
Project Initiation					
Systems Concept Formation					
Business Systems Analysis					
Technical Design					
Construction					
Test Planning & Preparation					
Testing					
Implementation					
Transition & Warranty	10/10/03	11/27/03	1/2/04	12/12/03	
Post Project Summation					

(Only deliverables/milestones shaded above the bold line will transfer to the dashboard)

3.2.4 How do I populate the “Testing” section?

The populate button for this section will fill in all information for the ‘Test Requirements’, ‘Test Case Execution’, and ‘Defects’ section provided that the project has this information stored on the Test Director database.

TESTING		Populate				
(utilizes TestDirector data)						
TEST REQUIREMENTS (throughout life of project)						
Test Requirements	11/15/2004	High	Medium	Low	Unknown	Total

3.3 Combined Weekly Status Report

3.3.1 How do I populate the "Budget" section?

The populate button for this section will fill in the 'Baseline', 'Usage', and 'Actual' hours (cumulative) for the month that is chosen in the accompanying dropdown, as well as for ATS and/or BASD depending on which NIKU numbers are entered into the project information fields at the top.

If one BASD NIKU number is entered, it is assumed that the report is for a combined project and the budget hours will be split across BASD and ATS. If there is a BASD NIKU number and an ATS NIKU number filled in, it is assumed that there are two project plans for the project and that the hours should come from these individual project plans.

BUDGET (IN HOURS)									
(select current month to add budget information)					(select current month to add budget information)				
BASD (Cumulative)					ATS (Cumulative)				
	Baseline	Usage*	Variance	Actual		Baseline	Usage*	Variance	Actual
January	0	0	0	0	January	0	0	0	0
February			0	613	February			0	276
March	0	0	0	0	March	0	0	0	0
April	0	0	0	0	April	0	0	0	0
May	0	0	0	0	May	0	0	0	0
June	0	0	0	0	June	0	0	0	0
July	0	0	0	0	July	0	0	0	0
August	0	0	0	0	August	0	0	0	0
September	0	0	0	0	September	0	0	0	0
October	0	0	0	0	October	0	0	0	0
November	0	0	0	0	November	0	0	0	0
December	0	0	0	0	December	0	0	0	0

* Usage = Actual + Estimate to Complete (ETC)

3.3.2 How do I populate the “Risks/Issues” section?

Similar to the functionality provided in the Risks/Issues dropdown in the status report, the dropdown in the section will be populated with the projects issues and risks with the dropdown arrow is clicked. After an issue or risk is selected, that issue or risk is sent to the textbox where you can add more detail as necessary for the report.

RISKS/ISSUES	
BASD	1:test risk 1 (select to add risk / issue)
3:Testing with Adam, Complete by 1:00PM, 2/16/2005 1:test risk 1, test action 1, 2/16/2005	
ATS	(select to add risk / issue)

* Any section with a yellow or red indicator must be addressed in the above section

Appendix G Project Reporting System Administration Documentation

1. Introduction

The purpose of this document is to allow for the maintenance of the automated Combined Weekly Status and Monthly Dashboard as well as the PM Portal.

2. PM Portal

This section serves as a guide to anyone who wishes to debug, modify, or learn from any part of the PM Portal's Oracle tables, Java Servlets, JSP pages, Data objects, or user interface. Understanding parts of this information will require at least a basic understanding of SQL, HTML, and the Java and JSP programming languages. In this documentation, a "report" refers to a specific portal page such as "issues" or "risks"

All programmable sections of the PM Portal are commented within the code using JavaDoc when applicable. The following topics address common issues that may come up within the life of the system.

Brackets ([report]) are used to denote any type of report that may require maintenance. For example, when referencing the function [report]_is[Report] in this document, the function could represent any of the following functions: issues_isIssue, risk_isRisk, and acceptance_isAcceptance.

2.1 Adding/Removing Fields to Portal Pages

If it is found that a field within a portal page needs to be added or removed, a number of components must be modified.

Database changes:

The PM Portal connects to Allmerica's AFSource database, otherwise known as the ATS Data Repository. Within this repository are three tables which are used by the portal: WPDB_ISSUE, WPDB_RISK, and WPDB_ACCEPTANCE. Within each table are fields which denote sections that PM's are expected to complete within an issue, risk, or acceptance report. Additional fields can be added to these tables when needed. Fields may also be removed from these tables assuming that the dependant Java classes and JSP files are modified as well.

Java class and servlet changes:

If a field were to be added or removed, several java classes and servlets would require modification. The java classes which represent issues, risks, and acceptances would have to reflect the field change by either adding or removing an attribute and adding or removing its setters and getters. Next, the java servlet page where the field would be located will have to be updated. More specifically, the save_[report] and update_[report] function would have to

be modified to reflect the changed attributes in the [report] class. Next, the OracleDataAccess class and the SQL queries it contains must be modified. Specifically, every function for the specified report would have to be modified other than the [report]_is[Report] function and the [report]_getMax[Report]Nbr function where [report] corresponds to the type of report in which the field is located.

JSP page changes:

Lastly, the JSP pages which display the reports must be changed to reflect the change in field structure. Changes must be made in two sections, the report editing section and the report listing section. If a field is to be removed, the administrator can simply delete code referring to the field. If a field is to be added, a new input type must be added to the editing section in order to accommodate the editing and adding of the field information. The name of the field must be the same as the name of the field in the database. The value of the field must point to the edit_[report] object's representation of the field. For example, if a deadline_dt field were to be added in the issue report, an input of type "text" would be added with the name "deadline_dt" and the value "edit_issue.getDeadline_dt". Lastly, in the report viewing area at the bottom of the page, another column must be added to the table which shows report information. In this column, a field title must be given with a clickable link that sends the name of the field to be sorted. Next, the field data must be displayed within the table's while loop by accessing the cur_[report] object. For example, if a deadline_dt field were to be added, a column would be created with a clickable link to the label "deadline date" that sends a get request with the action "sort" and an order_by value of "deadline_dt". Under that label, deadline_dt data would be displayed through a while loop which references cur_issue.getDeadline_dt().

2.2 Modifying UI Structure of Portal Pages

The PM Portal Pages are divided into three major sections; a top table containing navigation, a middle table which allows for data manipulation, and a bottom data grid.

The middle table is divided into four columns representing two sets of field labels and two sets of input fields. Any modifications to this table (such as the addition or removal of data entry fields) should be fairly straightforward; however the following cell heights must be applied if any modifications are made:

Height of single line cells (such as text input fields or dropdowns)	30
Height of multi-line cells (such as those with multi-line <textarea> tags)	70

The "tabindex" property of applicable controls will also need to be modified if sections are added or removed from the middle table. The resizing behavior of the table must also be verified after any changes are made. The table is designed to be horizontally resizable to accommodate for browser resizing and a variety of resolutions. The desired resizing behavior is achieved by eliminating all <TD> widths with the exception of the bottom left <TD> whose width is set to 120 and the third <TD> over from the bottom left whose width is likewise set to 120. The table width property is set to 100%. These values must be verified whenever any changes are made.

2.2.1 Creating Additional Buttons

The “Save,” “New,” and “Delete” buttons are coded using `<INPUT TYPE="SUBMIT">` as opposed to the `<button>` tags used in the Niku 6 pages. This design choice was deliberately made due to the problematic implementation of the `<button>` tag in various browsers as well as due to difficulty with handling the post requests from `<button>` tags in our JSP-based back end. We recommend utilizing similar `<INPUT TYPE="SUBMIT">` buttons for any future development efforts.

2.3 Adding Additional PM Portal Pages

Additional pages may be added to the PM Portal by replicating an existing page and making minimal modifications to accommodate the new data stored. This process should not be very labor intensive as most of the work will involve copying functionality from other reports and changing label and variable names.

Concerning the UI, additional tab(s) will need to be added to provide navigation for the new page(s). This process should also be made fairly straightforward by following the example of the existing pages. One point of note is the horizontal black bar is found below the tabs. The black bar accentuates the effect of “active” vs “inactive” tab. Any additional PM Portal Pages will need to properly modify the display of this bar. The effect is achieved by creating `<td height="1">` tags and varying background colors. The active tab should be made to have a `width="90"` and `bgcolor="#798A9C"`. Inactive tabs should have `width="81"` `bgcolor="#000000"`.

Concerning the database, another table will have to be created to store information about the new report. For example, if change logs were to be added to the PM Portal, a table named `WPDB_CHANGES` may be created with fields pertinent to that report.

Concerning the Java servlets, another servlet would have to be created to support the new report. This servlet would most likely mirror the functionality of the other report servlets. Similarly, another data class would have to be created to hold the new reports information with attributes and getters and setters created for each field. Lastly, functions would have to be created within the `OracleDataAccess` object in order to accommodate the new SQL calls that would be required.

2.4 Extending JavaScript Functionality

JavaScript is utilized for several pieces of functionality within the PM Portal. The first is the popup `CalendarControl` found in “`JavaScript/CalendarControl.js`.” Any new releases of this code may be found at <https://engineering.purdue.edu/ECN/Resources/KnowledgeBase/Docs/20040414131404>

JavaScript is also utilized to provide client-side error checking and verification for certain user actions (such as when clicking the delete or new button, or entering a date). These JavaScripts are located in the `/JavaScript/` folder and are processed on button `onClick` events. The `ValidateForm()` function found in `date.js` file can be passed an unlimited number of arguments, so if additional date fields are added, they simply need to be passed `ValidateForm` akin to the method utilized for the existing fields.

2.5 Modifying CSS Styles

An external CSS file located at “css/index.css” is used for the majority of the styles in the Project Management Portal. This CSS file is a customized subset of the main Niku 6 style sheet (DefaultScreen.css). Many of the same style names are carried over to the PM Portal, however some are customized to better match the requirements of the website. Any new styles should be added to this primary style sheet. Defining styles within any specific .JSP page should be avoided.

2.6 Compatibility

The Project Management Portal was designed for use with Internet Explorer 6.0 and higher and resolutions of 800x600 and higher.

Third party browsers including Mozilla and Opera were tested to support the core functionality, however some adjustments will be necessary to preserve visual consistency if these browsers are introduced into the Allmerica Intranet at any point. Microsoft Windows was the only tested operating system.

Niku dependency:

Certain parts of the portal are dependant on an Oracle connection to a database holding niku-specific information. However a majority of the java and JSP code are independent enough to support other project management applications (ex: MS Project).

In order to accept this type of change, a number of files would need to be modified. The “Project” class would need to be modified to hold information relevant to the new PM application. For example, the attribute “external_id_desc” may have to be changed to a new way of defining unique projects.

Next, the OracleDataAccess object’s two functions “project_getProject” and “project_getProjectList” would have to change in order to reflect the new data access methods and sql in order to fill the new “Project” class.

Lastly, the index.JSP file would have to be modified in order to reflect the proper field names that have changed in the “Project” class.

2.7 PM Portal Technical Recommendations

The following table details certain technical recommendations for the PM Portal. These recommendations were created largely as a result of the user testing we conducted towards the conclusion of our project work. Some recommendations from the user testing were implemented into the delivered system (as shown in Appendix I). We were not able to implement the recommendations below due to time and resource constraints, however do recommend their implementation for future versions of the PM Portal. The recommendations are sorted by section and implementation priority.

PM Portal Technical Recommendations			
#	Recommendation	Implementation Suggestions	Priority (1 highest)
General			
1	User documentation should be linked on the PM Portal.		2
2	“New” button should have no prompt if no changes have been made to the current page	Should be possible with JavaScript	2
3	Calendar should disappear when clicking on “white space” in the page	Other calendars allow for this functionality (http://www.dynarch.com/projects/calendar/)	2
4	Names should be validated upon entry (ensure standardized input format and data integrity)	Utilize an “auto-complete” JavaScript similar to Google Suggest (http://www.google.com/webhp?complete=1&hl=en)	3
5	Implement a special “print view.”		4
Risks Page			
6	Risks can develop into issues, so there should be a capability to move one to the other		2
7	Sorting by risk factor should be possible	This is currently not implemented because risk factor is a calculated field	3
Acceptances Page			
8	A list of common deliverables should be available in a dropdown	“Deliverable Acceptance Matrix” document should house list of common deliverables	2
9	Users should have ability to add “physical proof” of acceptance in the form of an attachment		4

3. Automated Workbook

The solution we developed for the workbook automates select sections in both of the reports by giving the Project Manager a choice to populate certain fields with information by clicking a button or choosing a selection from a dropdown. This is meant to make the reporting process easier and more streamlined for Project Managers, which will increase the amount of time they have to focus on more significant issues. However, the accuracy and usefulness of the information provided by this solution is a reflection of how well maintained and documented the project’s related project plan is. Therefore, a poorly managed and inaccurate project plan will result in inaccurate and unusable data being populated into cells of the workbook.

To create our solution, we implemented VBA macros and assigned them to various controls in the workbook. The OO4O database connectivity tool was chosen due to its seamless, optimized performance with Oracle databases in conjunction with Windows applications.

3.1 UI Design

3.1.1 Adding or Removing UI Components

The spreadsheets feature controls including drop down menus and buttons from the “Control Toolbox” toolbar (View -> Toolbars -> Control Toolbox). If any additional controls are required in the future, they are likely to come from this toolbar. One exception is the dropdowns indicating “R,” “Y,” “G.” status, which are created using Excel Conditional formatting (Format -> Conditional Formatting).

3.1.2 Modifying UI Design

The user interface of the combined status and dashboard was fully redesigned as part of the WPI MQP project. Adequate report design was largely achieved by varying row and column sizes and by merging and unmerging cells (Format -> Cells -> Alignment -> Merge Cells).

The new design reflects a color scheme which matches that of the web-based Project Management Portal. The report has also been reformatted to adequately fit resolutions of 800x600. Any future design changes should maintain the established color scheme and ensure continued support for this resolution.

The following color palette has been established for use with current and future Allmerica report designs:



This palette may be accessed by utilizing the “fill color” dropdown in Excel. Excel allows for 56 colors to be used at any one time, however these 56 colors can be defined by the user by accessing the Tools -> Options -> Color tab as described at <http://www.exceluser.com/solutions/anycolor.htm>. Note that not all colors in the established palette are used or should be used with this

report design, they are simply placeholders to reach the 56 color requirement.

Each section of the spreadsheet is separated by specific design elements as witnessed by viewing the spreadsheet. Font families and sizes are specifically selected and should be reused when making modifications to the report.

Heading Font:	Arial
Text Entry Font:	Times New Roman

All row heights are likewise very deliberate.

Report heading:	2 rows, heights 27, 23
Row height above section heading:	26
Row height below section heading:	12
Row height at the end of a section:	25

The ATS/BASD logo found in the top right corner of the reports is a high resolution PNG file with a transparent background that can be reused for other applications if necessary.

3.1.3 Modifying Report Printing Options

Report page breaks have been specifically set and can be viewed and altered by accessing View -> Page Break View. The defined page breaks may need to be adjusted if the length of the report is modified.

3.2 VB Design

For the weekly status report worksheet, this solution offers the option to automate the completion of the “General Info”, “Project / Deliverable Schedule Status”, and “Testing” sections. In addition, it provides a populated combo box of issues and risks for the “Issues / Risks” section. The “Testing” section was worked on largely by an independent Allmerica Team lead by Lee Tambeau (ltambeau@allmerica.com, Worcester) and Ravi Mamidi (Technical Contact, rmamidi@allmerica.com, Howell, Michigan)

For the monthly dashboard worksheet, this solution automatically fills the “Project Information”, “Overall Project Dashboard”, “Schedule” and “Risks / Issues” section from the weekly status report. It also offers the option to automate the completion of the “Budget” section. The following is a description of the functionality provided by each individual element of the solution, accompanied by some highlights on particular maintenance issues if they exist.

3.2.1 Excel Command Button Tools

Excel has the ability to implement tools for use in the spreadsheet due to built in VBA functionality. Among them, we found the command button tool particularly useful. Since most of the functionality involving movement of data from the ATS repository to the

spreadsheet does not require any extraneous input from the user but rather simply the choice to do so, the button was perfectly suited for most applications of our code. The following are pieces of functionality which were implemented with command button tools.

“General Info” Populate Button

The macro assigned to this button retrieves information from the ATS data repository that populates the ‘Project Name’, ‘IP Number’, and ‘IP Name’ fields with the proper information based on the NIKU number provided by the user.

“Project / Deliverable Schedule Status” Populate Button

The macro assigned to this button retrieves information from the ATS data repository that populates the ‘Planned Start Date’, ‘Actual/Est. Start Date’, ‘Planned Completion Date’, ‘Actual/Est. Completion Date’, and ‘Status’ fields of ‘Major Deliverables / Milestones’, for which the resulting recordset has matching records, with the proper information based on the provided NIKU number. If milestones need to be deleted, added, or manipulated in any manner, it would simply require the deletion, addition, or manipulation of a ‘Case’ statement in the section of the sub-procedure shown below.

```
.....  
  
'This loop will move through the recordset and fill  
'in dates for phases that match up with the phases  
'in the Status Report.  
  
While OraSched.EOF = False  
  
    Select Case OraSched.Fields(0).Value  
  
        Case "Project Initiation"  
  
            ThisWorkbook.Names("Proj_Plan_Start").RefersToRange.Value = OraSched.Fields(1).Value  
            ThisWorkbook.Names("Proj_Act_Start").RefersToRange.Value = OraSched.Fields(2).Value  
            ThisWorkbook.Names("Proj_Plan_Comp").RefersToRange.Value = OraSched.Fields(3).Value  
            ThisWorkbook.Names("Proj_Act_Comp").RefersToRange.Value = OraSched.Fields(4).Value  
  
        Case "System Concepts Formation Phase"  
  
            ThisWorkbook.Names("Sys_Plan_Start").RefersToRange.Value = OraSched.Fields(1).Value  
            ThisWorkbook.Names("Sys_Act_Start").RefersToRange.Value = OraSched.Fields(2).Value  
            ThisWorkbook.Names("Sys_Plan_Comp").RefersToRange.Value = OraSched.Fields(3).Value  
            ThisWorkbook.Names("Sys_Act_Comp").RefersToRange.Value = OraSched.Fields(4).Value  
  
.....
```

“Testing” Populate Button

The macro assigned to this button retrieves information from the Test Director repository and populates all areas of the testing section, including ‘Defects’. The sub-

procedure for this function was written by the Test Director team in Howell and was not altered.

3.2.2 Excel ComboBox Tools

“Issues /Risks” Dropdown (Weekly Status Report)

The macro assigned to the four controls in each of the ‘Deliverable Name and Description’ cells in this section retrieves information from the ATS data repository that populates it with a list of acceptances that are pertinent to a project based on the provided NIKU number. Upon selection of an issue or risk, the corresponding ‘Resolution Plan’ and ‘Target Date’ fields are populated.

“Acceptance and Change Management” Dropdown (Weekly Status Report)

The macro assigned to the ten controls in each of the ‘Description’ cells in this section retrieves information from the ATS data repository that populates it with a list of issues and risks options that are pertinent to a project based on the provided NIKU number. Upon selection of an acceptance, the corresponding ‘Approved By and ‘Status’ fields are populated.

“Risk / Issues” Dropdown (Combined Dashboard Report)

The macro assigned to this dropdown retrieves information from the ATS data repository that populates it with a list of issues and risks options that are pertinent to a project based on the provided NIKU number. When an issue or risk is selected it is moved into the ‘Risk/Issues’ textbox and then followed by a manual return. This is so that if there is another selection it will appear on the line below, allowing for the entry of more detail per issue or risk if necessary.

“Budget” Dropdown

The macro assigned to this dropdown populates it with a list of month prefixes that match ones provided in the Excel spreadsheet. The macro runs when the workbook is opened. When a month is selected, information is retrieved from the ATS data repository that populates the ‘Baseline’, ‘Usage’, and ‘Actual’ fields for either BASD or ATS, depending on which dropdown was utilized, for months which the resulting recordset has matching records. The ‘Variance’ field is automatically calculated for any record where ‘Baseline’ and ‘Usage’ is provided.

3.2.3 Other Functionality

The following sub-procedures are invoked in one or more of the preceding sub-procedure and are not specific to either the Status Report or Dashboard Report.

ConnectToOracle

This modular procedure establishes a connection to the Oracle database and is used at the beginning of all sub-procedures that involve database connectivity:

```

Public objSession As Object
Public objDataBase As Object

Sub ConnectToOracle()

    'Create a reference to the OO4O dll
    Set objSession = CreateObject("OracleInProcServer.XOraSession")

    'Create a reference to my database
    Set objDataBase = objSession.OpenDatabase("NFRD.allmerica.com", "NFRPT/NFRPT", 0&)

End Sub

```

SetNikuNum

This modular procedure establishes a global variable and sets its value to the provided Niku Number value so that it may be used in all sub-procedures as it is the key to retrieving all information for the Status Report and Dashboard Report. Due to the possible scenario of one project having more than one Niku Number (one for both ATS and BASD), the logic for this code checks to see which piece of functionality is calling it and assigns a value for the Niku Number accordingly.

```

'This procedure returns the "active" Niku number (be it, Status/Dashboard or ATS/BASD)
Public Niku_Num As String

Function SetNikuNum(ControlObject As String)

SetNikuNum = True

' if ATS Dropdown on Dashboard is selected
If ControlObject = "cboDashRisk2" Or ControlObject = "cboMonthATS" Then
    If ThisWorkbook.Names("Dashboard_ATS_Niku_Num").RefersToRange.Value <> "" Then
        Niku_Num = ThisWorkbook.Names("Dashboard_ATS_Niku_Num").RefersToRange.Value

    ElseIf ThisWorkbook.Names("Dashboard_BASD_Niku_Num").RefersToRange.Value <> "" Then
        Niku_Num = ThisWorkbook.Names("Dashboard_BASD_Niku_Num").RefersToRange.Value
    Else
        SetNikuNum = False
    End If

End If

' if BASD Dropdown on Dashboard is selected
If ControlObject = "cboDashRisk1" Or ControlObject = "cboMonthBASD" Then
    If ThisWorkbook.Names("Dashboard_BASD_Niku_Num").RefersToRange.Value <> "" Then
        Niku_Num = ThisWorkbook.Names("Dashboard_BASD_Niku_Num").RefersToRange.Value
    Else
        SetNikuNum = False
    End If
End If

' if a Dropdown on the Status Report is selected
If ControlObject = "cboStatRisk1" Or ControlObject = "cboStatRisk2" Or ControlObject = "cboStatRisk3"

```

```

Or ControlObject = "cboStatRisk4" Or ControlObject = "cboStatAccept1" Or ControlObject =
"cboStatAccept2" Or ControlObject = "cboStatAccept3" Or ControlObject = "cboStatAccept4" Or
ControlObject = "cboStatAccept5" Or ControlObject = "cboStatAccept6" Or ControlObject =
"cboStatAccept7" Or ControlObject = "cboStatAccept8" Or ControlObject = "cboStatAccept9" Or
ControlObject = "cboStatAccept10" Then

    If ThisWorkbook.Names("Satus_Niku_Number").RefersToRange.Value <> "" Then
        Niku_Num = ThisWorkbook.Names("Satus_Niku_Number").RefersToRange.Value
    Else
        SetNikuNum = False
    End If
End If

' if a Button on the Status Report is selected
If ControlObject = "btnSched" Or ControlObject = "btnTesting" Or ControlObject = "btnProjInfo" Then
    If ThisWorkbook.Names("Satus_Niku_Number").RefersToRange.Value <> "" Then
        Niku_Num = ThisWorkbook.Names("Satus_Niku_Number").RefersToRange.Value
    Else
        SetNikuNum = False
        MsgBox ("Please enter Niku Number in top left.")
    End If
End If

End Function

```

3.3 Maintainability

The macros developed in VBA to retrieve and display project information in the reports are subject to a number of assumptions that could possibly render the solution useless were the format or structure of either the workbook or ATS data repository to change. In particular, the extensive use of cell references in the VBA code is vulnerable to this issue. To display the results of the queries, certain cells and/or ranges must be designated for population. In the event that the structure or design of the weekly status report or monthly dashboard report were to change, the respective cells, and ranges of cells, referred to in the macro of the associated populate button of its section would need to be modified accordingly. To solve this problem, we implemented a piece of Excel functionality called 'Named Ranges'. This allows the developer to assign a name to a cell which will reference the actual cell number when called. If the cell is moved or rearranged in any way, any code that it is utilized in will not break because the name will now refer to a new cell range automatically. Names Ranges have been applied to every cell which is important in the automation process of the workbook.

In addition, this solution utilizes the OO4O database connectivity tool, which is only applicable to Oracle databases. If the database format of the ATS data repository were to change, a different connectivity tool would need to be implemented.

3.4 Compatibility

The workbook was designed and tested in Excel 2003. Older versions of excel should be functional, but have not been tested. The OO4O Oracle data access relies on the availability of the Oracle Client on all end-user machines. This client is currently installed on

some but not all machines at Allmerica. The client is free and is available for distribution though the helpdesk via Zen, or from Oracle’s website.

3.5 Workbook Technical Recommendations

The following table details certain technical recommendations for the Workbook. These recommendations were created largely as a result of the user testing we conducted towards the conclusion of our project work. Some recommendations from the user testing were implemented into the delivered system (as shown in Appendix I). We were not able to implement the recommendations below due to time and resource constraints, however do recommend their implementation for future versions of the Workbook. The recommendations are sorted by section and implementation priority.

Workbook Technical Recommendations			
Number	Recommendation	Implementation Suggestions	Priority (1 highest)
General			
1	All SQL code should be moved to Oracle Views		1
2	Location of user documentation should be specified on the “front” sheet		4
Status Report Sheet			
3	Combined Status report should be re-engineered to account for use by both ATS/BASD	Dashboard should be used as model	1
4	TestDirector VBA code needs to be re-written to use named ranges, and documented.		1
Dashboard Sheet			
5	Testing section should be completed once TestDirector data on Status Report is finalized		1

Appendix H Testing Scripts

Test user:

Date:

Time started:

Time finished:

Test Scenario: Project Manager Portal		
Set Up	Expected Results	Pass/Fail/Notes
<p><i>Provide instructions for every step that the tester can expect to encounter.</i></p> <p><i>(e.g. log in/select option 3/entercustomer id/enter state.)</i></p>	<p><i>Based on the instructions provided details on what the tester can expect to see. If multiple results are expected, a bulleted list of the outcomes should be identified.</i></p>	<p><i>Tester enters either a Pass/Fail as a result of the test conducted. Enter notes based on user comments/actions.</i></p>
Set Up	Expected Results	Pass/Fail/Notes
<p>Navigate to the project manager portal by typing the url:</p> <p>http://h00579:9080/PMPortal/</p> <p>into internet explorer and pressing enter</p>	<ul style="list-style-type: none"> The PM Portal should load with a listing of all active projects 	
<p>Select your own project by typing in the niku number of your project into the text input labeled “enter project number”. (niku numbers can be found by opening your niku project plan)</p>	<ul style="list-style-type: none"> Issues page for your project should load 	
<p>Click the “return to project listings” link in the top left of the page</p>	<ul style="list-style-type: none"> You should return to the project listings page 	
<p>Select the first project on the list by clicking the “issues” link next to the project labeled: 2005SSWIP0035</p>	<ul style="list-style-type: none"> The current page should switch to the “Issues” page for this project All Issues for this project should be displayed in the table at the bottom of the page. 	

<p>Hide the entry form by clicking once on the Show/Hide Section link. Show it once again by clicking the Show/Hide link</p>	<ul style="list-style-type: none"> • If the entry form is visible, the form should disappear when clicked. • If the entry form is not visible, the form should appear when clicked. 	
<p>Enter new Issue description by typing into the text box labeled “Issue”.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Any characters typed should appear in the text box, and the text box may be scrollable if numbers of characters exceed the text box size. 	
<p>Enter new Impact description by typing into the text box labeled “Impact”.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Any characters typed should appear in the text box, and the text box may be scrollable if number of characters exceeds the text box size. 	
<p>Rate Impact by clicking once on the drop down list labeled “Impact Rating”.</p>	<ul style="list-style-type: none"> • A list of ratings of High, High-Medium, Medium, Medium-Low, and Low should appear. • You should not be able to type text in the list box. • The rating that has been selected should appear on the top of the list. 	
<p>Enter new Resolution Action description by typing into the text box labeled “Issue Resolution Actions”.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Any characters typed should appear in the text box, and the text box may be scrollable if number of characters exceed the text box size 	
<p>Enter the name/s of who this issue is assigned to by typing the name in the text box labeled “Assigned to”.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Any characters typed should appear in the text box. 	

<p>Enter the projects due date clicking once in the text box to bring up the calendar. Use the side arrows in the calendar to navigate between years and months, and click on the date to select the date.</p>	<ul style="list-style-type: none"> • The date selected should appear in the text box. 	
<p>Enter the date the project is closed by clicking once in the text box to bring up the calendar. Use the side arrows in the calendar to navigate between years and months, and click on the date to select the date.</p>	<ul style="list-style-type: none"> • The date selected should appear in the text box. 	
<p>Enter any comments by typing into the text box labeled “Status/Comments”.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Any characters typed should appear in the text box, and the text box may be scrollable if number of characters exceed the text box size 	
<p>Save all entries from the previous steps as a new issue by clicking once on the Save button.</p>	<ul style="list-style-type: none"> • Each save will be assigned numbers consecutively as entered. • A confirmation of the save should appear in the last row of the table at the bottom of the page, with the next number in order assigned to it. Everything typed into the form should appear in the last row as well. • The users name and the current date should also appear in the table under the column entitled ‘Created by’. • The current date should also appear in the column entitled ‘Last Updated’, and the creators name should also appear in the column ‘Last Updated By.’ 	

<p>Select the previous project clicking on the entry in the table at the bottom of the page. Modify previous entries by entering a new Issue, and click once on the Save button.</p>	<ul style="list-style-type: none"> • All data from the entry should appear in the appropriate text boxes, and all list box selections should appear at the top of the lists. • The form should be modifiable, and the Issue Number should be displayed at the top of the form next the name of the creator. • The updaters name should appear below this next to the date is had last been updated. • In addition, the changes should appear in the table at the bottom after clicking once on the Save button. • The current date should also appear in the column entitled 'Last Updated', and the updaters name should also appear in the column 'Last Updated By.' 	
<p>Delete the entry that was previously entered by clicking on the entry in the table at the bottom of the page. Then click the button labeled 'Delete.'</p>	<ul style="list-style-type: none"> • All data from the entry should appear in the appropriate text boxes, and all list box selections should appear at the top of the lists. • The form should be modifiable, and when clicked, the Delete button should clear the form, and erase the entry from the table at the bottom of the page. 	
<p>Clear the screen and ready it for a new entry by clicking the New button.</p>	<p>All text boxes should clear, and all drop down boxes should list the default selections at the top.</p>	
<p>To sort all Issues by numerically by Issue Number, click once on the Column header labeled 'Num.' To sort descending, click once again.</p>	<p>Each row should be arranged by Issue Number.</p>	

<p>To sort all Issues by the date of when it was last updated, click once on the Column header labeled 'Last Updated.' To sort descending, click once again.</p>	<p>Each row should be arranged by the date of the last update.</p>	
<p>To sort all Issues alphabetically by the name of person who last updated the entry, click once on the Column header labeled 'Last Updated by.' To sort descending, click once again.</p>	<p>Each row should be arranged by the name of who made the last update.</p>	
<p>To sort all Issues alphabetically by Issue, click once on the Column header labeled 'Issue.' To sort descending, click once again.</p>	<p>Each row should be arranged by Issue.</p>	
<p>To sort all Issues alphabetically by Impact, click once on the Column header labeled 'Impact.' To sort descending, click once again.</p>	<p>Each row should be arranged by Impact.</p>	
<p>To sort all Issues by Impact Rating, click once on the Column header labeled 'Impact Rating.' To sort descending, click once again.</p>	<p>Each row should be arranged by Impact Rating, in order or reverse of High, High-medium, Medium, Medium-Low, and Low.</p>	
<p>To sort all Issues alphabetically by Resolution Actions, click once on the Column header labeled 'Resolution Actions.' To sort descending, click once again.</p>	<p>Each row should be arranged by Resolution Action.</p>	
<p>To sort all Issues alphabetically by the name of who it has been assigned to, click once on the Column header labeled 'Assigned to.' To sort descending, click once again.</p>	<p>Each row should be arranged by the name of the person it has been assigned to.</p>	
<p>To sort all Issues by the date of when it is due, click once on the Column header labeled 'Date Due.' To sort descending, click once again.</p>	<p>Each row should be arranged by the date the issue resolution is due.</p>	

<p>To sort all Issues by the date of when it was close, click once on the Column header labeled 'Date Closed.' To sort descending, click once again.</p>	<p>Each row should be arranged by the date the issue has been closed.</p>	
<p>To sort all Issues alphabetically by the comments, click once on the Column header labeled 'Status/Comments.' To sort descending, click once again.</p>	<p>Each row should be arranged by Comments.</p>	
<p>Navigate to the Risks page by clicking once on the tab labeled "Risks".</p>	<ul style="list-style-type: none"> • The entry form should change from Issues to Risks. • The table at the bottom of the page should change from all issues for the active project to all risks for the project. 	
<p>Navigate to Acceptances by clicking once on the tab labeled "Acceptances".</p>	<ul style="list-style-type: none"> • The entry form should change from Risks to Acceptances. • The table at the bottom of the page should change from all risks for the active project to all acceptances for the project. 	
<p>Did the buttons and drop downs on the page behave as you expected?</p>		
<p>What are your thoughts on page layout and design?</p>		
<p>Were the provided fields adequate?</p>		

Test Scenario: Weekly Status Report		
Set Up	Expected Results	Pass/Fail/Notes
<i>Provide instructions for every step that the tester can expect to encounter. (e.g. log in/select option 3/entercustomer id/enter state.)</i>	<i>Based on the instructions provided details on what the tester can expect to see. If multiple results are expected, a bulleted list of the outcomes should be identified.</i>	<i>Tester enters either a Pass/Fail as a result of the test conducted. Enter notes based on user comments/actions</i>
Set Up	Expected Results	Pass/Fail/Notes
Go to the start menu and click the “run” icon. Type in the address “\\h00579” and press enter. Choose the “WPI Testing Files” folder and copy the “Combined Status & Dashboard 3.0” file to your desktop	<ul style="list-style-type: none"> The weekly status report and monthly dashboard workbook will be copied to the user’s desktop 	
Double click on the file “Combined Status & Dashboard 3.0”	<ul style="list-style-type: none"> Worksheet opens 	
Enter the niku number of your project in the “NIKU/RMPO Number:” field (niku numbers can be found by opening a project’s niku project plan)	<ul style="list-style-type: none"> Niku number will be entered in the cell 	
Populate Project Information by clicking on the POPULATE button once with the mouse.	<ul style="list-style-type: none"> Project name, IP Name, and IP Number are filled with correct data 	
Modify text for the IP Name, IP Number text boxes by double clicking anywhere in the text box and changing the text	<ul style="list-style-type: none"> Cursor should change from arrow to insert bar. Text should be modified 	
Use the drop down provided to enter information into the “issues/risks” section.	<ul style="list-style-type: none"> The drop downs should be populated with issues and risks that were entered for this project on the PM Portal Once an issue or risk has been selected, it’s information should be added to the next line 	

<p>Edit information that was retrieved from the pull-down by clicking on the cell and typing</p>	<ul style="list-style-type: none"> • The text that was added by the pull-down should be replaced with new text 	
<p>Populate Project/ Deliverable Schedule Status by clicking on the POPULATE button once with the mouse.</p>	<ul style="list-style-type: none"> • Planned and actual start and completion dates for all deliverables are filled with data as it is displayed on the corresponding Niku Work Plan. 	
<p>Modify text in Populate Project/ Deliverable Schedule Status cells by double clicking anywhere in the text box.</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar. • Text should be modified 	
<p>Use the drop down provided in the “Acceptance” section to enter information in to the “deliverable name & description” section.</p>	<ul style="list-style-type: none"> • The drop down should be populated with acceptances that were added through the PM portal • Once an acceptance has been selected, its information should be added to the “approved by”, “status”, and “deliverable name & description” fields 	
<p>Modify text that was populated by the drop down by double clicking on the acceptance cell with information and entering new text</p>	<ul style="list-style-type: none"> • Cursor should change from arrow to insert bar • Text should be modified 	

Test Scenario: Complete Monthly Dashboard		
Set Up	Expected Results	Pass/Fail
<i>Provide instructions for every step that the tester can expect to encounter. (e.g. log in/select option 3/entercustomer id/enter state.)</i>	<i>Based on the instructions provided details on what the tester can expect to see. If multiple results are expected, a bulleted list of the outcomes should be identified.</i>	<i>Tester enters either a Pass/Fail as a result of the test conducted. Enter notes based on user comments/actions</i>
Set Up	Expected Results	Pass/Fail
Start Monthly Dashboard by clicking on the “combined dashboard” worksheet tab at the bottom	<ul style="list-style-type: none"> • Worksheet switches to the combined dashboard 	
Type in the niku number for your BASD or ATS project in the fields labeled “BASD Niku Number” or “ATS Niku Number”. If you are working on a combined project, place the niku number in the BASD field	<ul style="list-style-type: none"> • The selected cell should contain the niku number of the project 	
Scroll to the “Budget” section. Choose which drop down is appropriate (ATS or BASD). Click the drop down and select the current month	<ul style="list-style-type: none"> • Baseline, usage, variance, and actual information should be correctly filled in for the selected month 	
Find the “Risks/Issues” section. Choose which text area is appropriate (ATS or BASD). Click the drop down to select an issue or risk to add to the text area	<ul style="list-style-type: none"> • The issue or risk selected in the drop down should be added as the next line of text within the text area 	
Modify the issue or risk that was added to the text area	<ul style="list-style-type: none"> • The issue or risk that was added should be modified 	

Do you feel this system would help you complete your monthly and weekly reports?

Do you have any suggestions or comments?

Appendix I User Testing Results

The user testing results on the following pages show comments and suggestions that we received while conducting user testing for our designed system. Some of these suggestions were implemented into the system delivered by the end of the project. These suggestions are italicized. Other technical suggestions which we did not implement due to resource and/or time constraints may be found in the System Administration Documentation (Appendix G).

User Testing Results – Page 1

(note: implemented changes are *italicized*)

Project Manager	Relevant Problems	Their Suggestions	Our Suggestions/ notes
<p>Brian Fitzgerald</p>	<ul style="list-style-type: none"> • PM Portal <ul style="list-style-type: none"> ○ Risks: <ul style="list-style-type: none"> • * “Back to Project Listing” hyperlink is 404; • Bottom table did not have any shading or separation between rows – possible browser issue. 	<ul style="list-style-type: none"> • Workbook <ul style="list-style-type: none"> ○ The Weekly Status/Dashboard is only for the PMO. It is not useful for the business, and is generally not used for this purpose; ○ Questioned why the report was not put online. 	<ul style="list-style-type: none"> • PM Portal <ul style="list-style-type: none"> ○ Perhaps put a black bar below the tabs. • Workbook <ul style="list-style-type: none"> ○ Budget in the Dashboard needs testing, due to the populating of the wrong fields, and other errors. ○ * Macro Popups should be documented in the User Manual ○ * Make sure Oracle Client is deployed ahead of time.
<p>Terence Miner</p>	<ul style="list-style-type: none"> • PM Portal <ul style="list-style-type: none"> ○ Issues: After a field has been sorted, the page refreshes back to the top, instead of showing the issues listed again. 	<ul style="list-style-type: none"> • PM Portal <ul style="list-style-type: none"> ○ * Index: Change “Project Number” field name to “Niku Number” ○ Issues: Validate the names that are entered ○ * Acceptances: Since there are usually more than approvers, we should give the PM’s room to enter more than one “approver name” ○ Other: Would like to see a “print view” button that formats the page for printing. • Workbook <ul style="list-style-type: none"> ○ Status Report: <ul style="list-style-type: none"> ▪ Would like to see a drop down for the Niku Number; ▪ Also suggested that “Change management would be a great thing to automate.” ○ Other: Would like to see one Niku Number for the combined and status. 	<ul style="list-style-type: none"> • PM Portal <ul style="list-style-type: none"> ○ He liked the structure of the Portal; Thought it was easier to keep the data in a web interface rather than in excel. • Workbook <ul style="list-style-type: none"> ○ * We are considering ordering the items in the issue drop down by their issue_nbr.

User Testing Results – Page 2

(note: implemented changes are *italicized*)

Project Manager	Relevant Problems	Their Suggestions	Our Suggestions/ notes
<p>Rhett Gibbs and Kathy Massad</p>	<p>None</p>	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ Issues <ul style="list-style-type: none"> ▪ * Change “Status/Comments field to “Comments” ▪ * Sort by open issues first, meaning changing the sort for ASC to DESC for the closed date field. ▪ * Sorts should be retained after editing an issue ○ Risks: Sort by Risk Factor ○ Other: Change “Updated By” to “Created by ID and Date” ○ Workbook <ul style="list-style-type: none"> ○ * Budget Section: Should separate BASD AND ATS hours in combined projects. 	<p>None.</p>
<p>Rebecca Spinney</p>	<ul style="list-style-type: none"> ○ Workbook <ul style="list-style-type: none"> ○ * Status Report: Noticed that the dates on the schedule were correct but were not in reference to the correct estimation or completion dates. She provided us with a Niku Project Plan to verify these dates. ○ Dashboard: Not clearing “Project Information” when a new Niku number is added to the Status report and the Populate button isn’t pressed. PM’s should either know about this, or we should safeguard against this. Perhaps make it so it doesn’t carry over. 	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ Would like the calendar to disappear when clicking on the white space in the page. ○ * No need for “Status” 	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ She used to PM Portal Index to look up her own Niku Number ○ Complements on the consistency between pages.

User Testing Results – Page 3

(note: implemented changes are *italicized*)

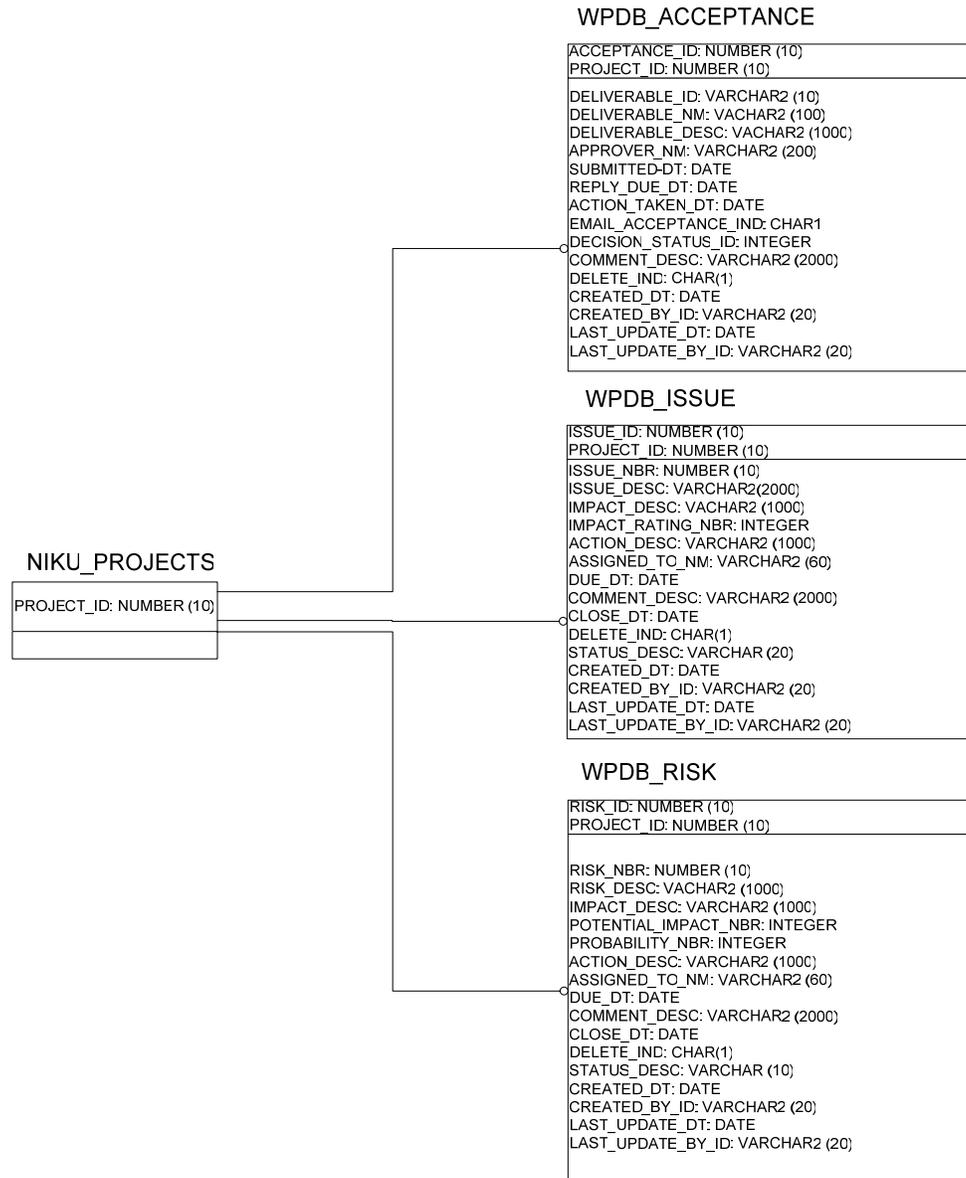
Project Manager	Relevant Problems	Their Suggestions	Our Suggestions/ notes
Eric Bernard	None.	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ Risks: Risks can develop into Issues, so PM’s should have the ability to move them over. ○ Other: <ul style="list-style-type: none"> ▪ Calendar “close” links blends with the blue bar at the bottom of the window. ▪ Issues should never really be deleted, so maybe we should make it an administrative function only. ▪ * “New” button should not have prompt if no changes have been made. ▪ Most projects have about 10 risks, maybe up to 50 max. ▪ Likes “Last Updated” as opposed to “Created by” on all pages. ▪ For examples of common deliverables, search for “deliverable acceptance matrix”. Deliverables can be standardized and perhaps offered in a dropdown. ▪ Would like the calendar to disappear when clicking on the white space in the page. ▪ Value added occurs when people other than him can enter issues/risks/acceptances. ○ Workbook <ul style="list-style-type: none"> ○ General: The whole thing does not add a lot of value. He used to copy and paste data from excel sheets, and now he can click drop downs. Time saving is not significant. 	None.
Kathleen Mills	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ Issues: Kept forgetting to use the (Last Name, First Name) format. 	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ Acceptance: Prefers that the date submitted be a manual field (as it is currently), rather than a JavaScript calendar. 	None.

User Testing Results – Page 4

(note: implemented changes are *italicized*)

Project Manager	Relevant Problems	Their Suggestions	Our Suggestions/ notes
<p>Louise Eichman</p>	<p>None.</p>	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ General <ul style="list-style-type: none"> ▪ Could not see the close link for the calendar, until she scrolled down the webpage. In other cases, it blended with the blue bar at the bottom of the window. ▪ Would like the calendar to disappear when clicking on the white space in the page. ▪ Recommends making the calendar appear higher, if possible, so that the “close” link is very visible. ○ Acceptances <ul style="list-style-type: none"> ▪ There is “no tangible or electronic proof that it was actually approved.” ▪ Some PM’s do not use excel sheets for acceptances, which is not a big deal. ○ Dashboard <ul style="list-style-type: none"> ○ Some of the Project Plan milestones are different, so when clicking populate, it will not transition cleanly, and will need to be overwritten. 	<ul style="list-style-type: none"> ○ PM Portal <ul style="list-style-type: none"> ○ General <ul style="list-style-type: none"> ▪ * 800x600 resolution issue, top table does not fit. ▪ * Concurrency control: issue number should be generated on save, not on page load. ○ Dashboard <ul style="list-style-type: none"> ○ Budget needs testing.

Appendix J System ERD



Appendix K Project Plans

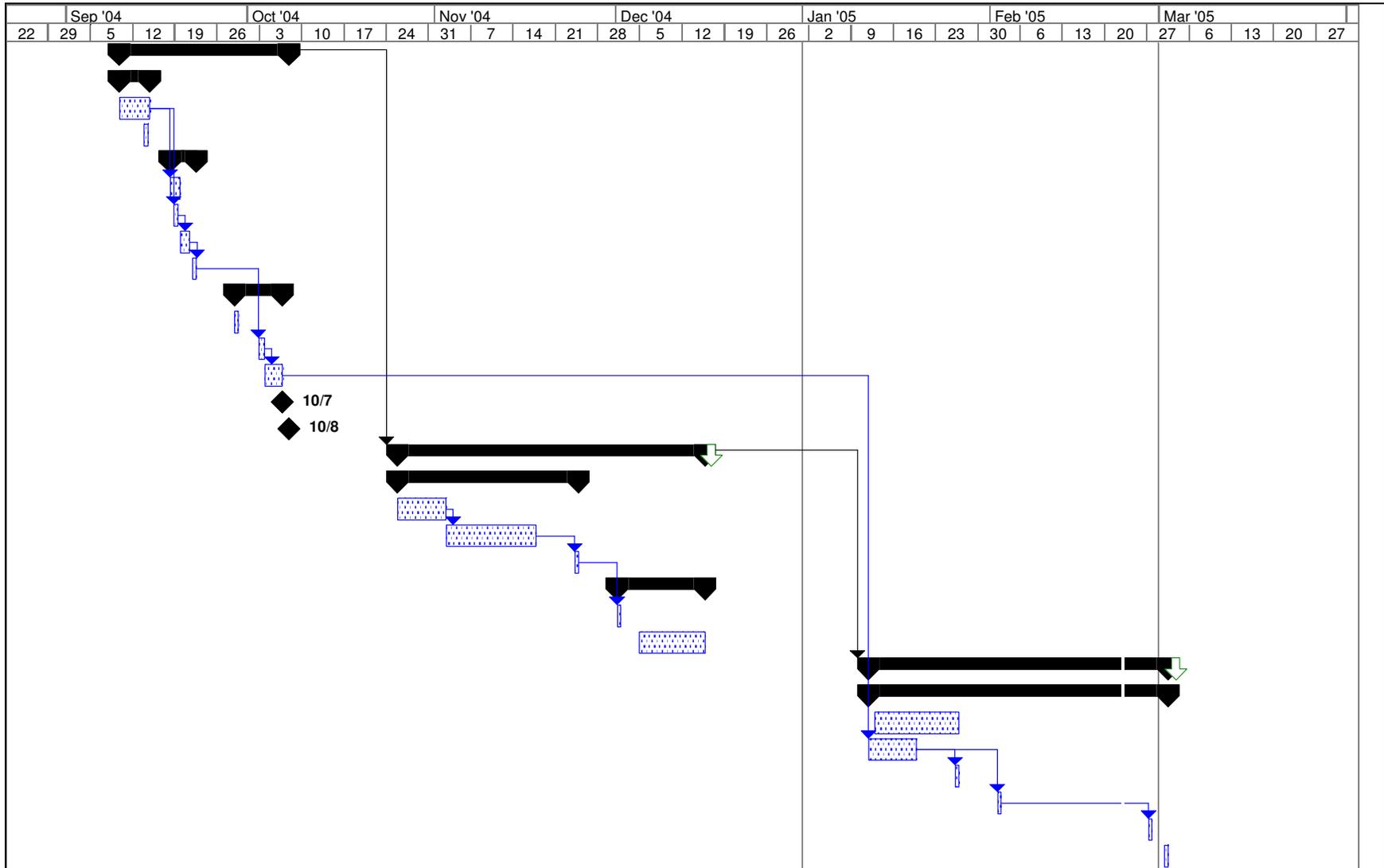
Throughout the course of the project we periodically created project plans in order to plan the future steps of our project. It may be interesting for future MQP groups to note the discrepancies between the first project plan we created and our last which is updated to reflect our actual progress. These two plans are provided on the following pages. The differences between the two project plans show the difficulties inherent in planning out a project of such length and scope. The most noticeable difference is in the almost month long discrepancy in time allocated for programming in the original plan as compared to the last. The steps needed for implementation were also not fully understood at the beginning of the project. These differences show how difficult project management can be, as so many different variables must be taken into account when planning a project.

Original Project Plan

ID	Task Name	Start	Finish	Predecessors	Resource Names
1	A TERM	Fri 9/10/04	Fri 10/8/04		
2	Planning	Fri 9/10/04	Tue 9/14/04		
3	Literature Review (ATS/BASD Procedures, PMI Guidelines, Allmerica Software)	Fri 9/10/04	Tue 9/14/04		
4	Project Plan	Tue 9/14/04	Tue 9/14/04		
5	Analysis	Sat 9/18/04	Wed 9/22/04		
6	Determine Business Requirements	Sat 9/18/04	Sun 9/19/04	3	
7	Create Use Cases	Sun 9/19/04	Sun 9/19/04	3	
8	Cost/Benefit Analysis (Buy vs. Build)	Mon 9/20/04	Tue 9/21/04	7	
9	Feasibility Assessment	Wed 9/22/04	Wed 9/22/04	8	
10	Design	Wed 9/29/04	Wed 10/6/04		
11	Interview ATS Architects	Wed 9/29/04	Wed 9/29/04		
12	Review Chosen Vendor Solutions	Sun 10/3/04	Sun 10/3/04	9	
13	Review Proposed Design with ATS Architects	Mon 10/4/04	Wed 10/6/04	12	
14	MQP Proposal Due	Thu 10/7/04	Thu 10/7/04		
15	Proposal Presentation	Fri 10/8/04	Fri 10/8/04		
16	B TERM	Tue 10/26/04	Wed 12/15/04	1	
17	Design	Tue 10/26/04	Wed 11/24/04		
18	Obtain Vendor Software for Review	Tue 10/26/04	Tue 11/2/04		
19	Evaluate Vendor Solutions	Wed 11/3/04	Wed 11/17/04	18	
20	Determine Technical Requirements for Integration Development	Wed 11/24/04	Wed 11/24/04	19	
21	Implementation	Wed 12/1/04	Wed 12/15/04		
22	Test Plan	Wed 12/1/04	Wed 12/1/04	20	
23	Conversion Plan	Sun 12/5/04	Wed 12/15/04		
24	C TERM	Wed 1/12/05	Wed 3/2/05	16	
25	Implementation	Wed 1/12/05	Wed 3/2/05		
26	Integration Testing	Thu 1/13/05	Wed 1/26/05		
27	User Acceptance Testing	Wed 1/12/05	Wed 1/19/05	13	
28	Training Plan	Wed 1/26/05	Wed 1/26/05	27	
29	Support Plan	Wed 2/2/05	Wed 2/2/05	27	
30	Recommendations	Sun 2/27/05	Sun 2/27/05	29	
31	Final Presentation	Wed 3/2/05	Wed 3/2/05		

	Task 	Milestone 	External Tasks 
	Split 	Summary 	External Milestone 
	Progress 	Project Summary 	Deadline 

Original Project Plan



Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

Final Project Plan

ID	Task Name	Start	Finish	% Complete	September 2004												October 2004			
					22	25	28	31	3	6	9	12	15	18	21	24	27	30	3	6
1	Planning and Analysis	Fri 9/10/04	Wed 10/13/04	100%	[Gantt bar: 100%]															
2	Literature Review (ATS/BASD Procedures, PMI Guidelines, Alln	Fri 9/10/04	Wed 9/22/04	100%	[Gantt bar: 100%]															
3	Define Business Problems	Wed 9/15/04	Wed 9/29/04	100%	[Gantt bar: 100%]															
4	Functional Requirements	Wed 9/22/04	Wed 10/6/04	100%	[Gantt bar: 100%]															
5	Define Scope	Wed 9/22/04	Wed 10/13/04	100%	[Gantt bar: 100%]															
6	Feasibility Assessment	Wed 9/22/04	Wed 10/13/04	100%	[Gantt bar: 100%]															
7	Analysis of Workbook	Sun 9/26/04	Wed 10/6/04	100%	[Gantt bar: 100%]															
8	Create Use Cases	Sun 9/26/04	Thu 9/30/04	100%	[Gantt bar: 100%]															
9	Conduct PM Interviews	Sun 10/3/04	Wed 10/6/04	100%	[Gantt bar: 100%]															
10	Project Proposal	Wed 10/13/04	Wed 10/27/04	100%	[Gantt bar: 100%]															
11	Create Presentation	Wed 10/13/04	Wed 10/27/04	100%	[Gantt bar: 100%]															
12	Project Presentation	Wed 10/27/04	Wed 10/27/04	100%	[Gantt bar: 100%]															
13	Proposal Due	Wed 10/27/04	Wed 10/27/04	100%	[Gantt bar: 100%]															
14	Design Workbook	Wed 10/27/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
15	Study Existing Database Architecture	Wed 10/27/04	Wed 11/3/04	100%	[Gantt bar: 100%]															
16	Testing/Defects and TestDirector Database Integration	Wed 11/10/04	Wed 2/2/05	100%	[Gantt bar: 100%]															
17	Program VB Macros	Sun 10/31/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
18	Formal Architectural Review	Wed 11/10/04	Wed 11/10/04	100%	[Gantt bar: 100%]															
19	Preliminary User Testing	Wed 11/10/04	Wed 11/17/04	100%	[Gantt bar: 100%]															
20	Design PM Portal	Wed 11/10/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
21	Architectural and Utilitary Planning Review	Wed 11/24/04	Wed 11/24/04	100%	[Gantt bar: 100%]															
22	Preliminary Architecture Design	Wed 11/10/04	Wed 12/8/04	100%	[Gantt bar: 100%]															
23	Create User Interface Mockups	Wed 11/17/04	Wed 12/8/04	100%	[Gantt bar: 100%]															
24	Create Tables for PM Portal	Wed 12/1/04	Wed 12/8/04	100%	[Gantt bar: 100%]															
25	Program HTML Interface	Wed 12/15/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
26	Program JSP Pages	Wed 12/8/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
27	Program Java Servlets	Wed 12/8/04	Wed 2/9/05	100%	[Gantt bar: 100%]															
28	User Testing	Mon 2/14/05	Thu 2/24/05	100%	[Gantt bar: 100%]															
29	Conduct user testing	Mon 2/14/05	Fri 2/18/05	100%	[Gantt bar: 100%]															
30	Implement user testing changes	Fri 2/18/05	Thu 2/24/05	100%	[Gantt bar: 100%]															
31	Implementation	Mon 2/21/05	Fri 2/25/05	100%	[Gantt bar: 100%]															
32	Move Portal to UAT	Fri 2/25/05	Fri 2/25/05	100%	[Gantt bar: 100%]															
33	Move database tables to production	Mon 2/21/05	Mon 2/21/05	100%	[Gantt bar: 100%]															
34	Project handover	Wed 3/2/05	Wed 3/2/05	0%	[Gantt bar: 0%]															
35	Final Report Due	Wed 3/2/05	Wed 3/2/05	0%	[Gantt bar: 0%]															
36	Final Presentation	Wed 3/2/05	Wed 3/2/05	0%	[Gantt bar: 0%]															

Final Project Plan

