

# **Velir Web Tracking Proposal**

A Major Qualifying Project Report:

In partial fulfillment of the requirements for the

Degree of Bachelor of Science



Worcester Polytechnic Institute

By

Matthew Dodd

James Ham

Alexzandria Haney

James Post

Date: February 29, 2012

Approved By:

---

Professor Eleanor Loiacono, Major Advisor

# Worcester Polytechnic Institute

## Major Qualifying Project

### Velir Web Tracking

Alexandria Haney, James Post, Matthew Dodd, James Ham

We hereby certify that all of our major business requirements, as well as a comprehensive analysis of our business needs, design, and implementation, have been met by the WPI MQP project team.

---

Tiven Weinstock (Liaison)

Director of Sales and Marketing

---

Dr. Eleanor Loiacono

Project Advisor

---

Dave Valliere (Project Sponsor)

Chief Operating Officer

---

Group Members

(Matthew Dodd, James Ham, Alexandria Haney, James Post)

# Table of Contents

<b>Introduction .....</b>	<b>5</b>
1.1 Velir Background .....	5
1.2 MQP Background.....	6
1.3 Problem Statement .....	6
1.4 Problem Objectives .....	8
<b>Literature Review .....</b>	<b>9</b>
2.1 Harvest Background .....	9
2.2 FogBugz Background .....	9
2.3 Systems Development Life Cycle (SDLC).....	10
2.4 Planning .....	10
2.5 Analysis.....	11
2.6 Design .....	11
2.7 Implementation .....	12
2.8 Methodology Options.....	12
2.9Decision .....	15
<b>Planning .....</b>	<b>16</b>
3.1 Analyzing Feasibility .....	16
3.2 Developing the Work Plan .....	18
3.3 Staffing the Project.....	18
3.4 Risk Assessment .....	18
<b>Analysis .....</b>	<b>20</b>
4.1 Interview Process .....	20
4.2 Key Points Breakdown.....	21
<b>Design .....</b>	<b>24</b>
5.1 Design Requirements Gathering .....	24
5.2 Design Implementation .....	24
5.3 Design Mockup.....	25
5.4 Report Mockup.....	27
5.5 Proposal Presentation .....	29
5.6 Update to Velir .....	29
5.7 Completed templates .....	30
<b>Implementation .....</b>	<b>32</b>
6.1 User Documentation .....	32
6.2 System Documentation .....	33
6.3 Conversion Plan.....	33
6.4 Training Plan .....	34
<b>Conclusion.....</b>	<b>35</b>

7.1 Recommendation .....	36
<b>Appendix A: System Request .....</b>	<b>39</b>
<b>Appendix B: Feasibility Analysis.....</b>	<b>40</b>
<b>Appendix C: Gantt Chart .....</b>	<b>42</b>
<b>Appendix D: Organizational Chart .....</b>	<b>43</b>
<b>Appendix E: Interviews .....</b>	<b>44</b>
Subject 1 .....	44
Subject 2 .....	45
Subject 3 .....	46
Subject 4 .....	46
Subject 5 .....	47
Subject 6 .....	48
Subject 7 .....	49
Subject 8 .....	50
<b>Appendix F: Interview Summaries and Key Points .....</b>	<b>51</b>
Subject 1 .....	51
Subject 2 .....	51
Subject 3 .....	52
Subject 4 .....	53
Subject 5 .....	53
Subject 6 .....	54
Subject 7 .....	55
Subject 8 .....	55
Velir MQP interview questions.....	56
<b>Appendix G: Advisor Meeting Agendas.....</b>	<b>57</b>
September 2 <sup>nd</sup> , 2011 .....	57
September 9 <sup>th</sup> , 2011 .....	57
September 16 <sup>th</sup> , 2011 .....	58
September 23 <sup>rd</sup> , 2011 .....	58
September 30 <sup>th</sup> , 2011 .....	59
October 7 <sup>th</sup> , 2011 .....	60
October 28 <sup>th</sup> , 2011 .....	60
November 5 <sup>th</sup> , 2011.....	61
November 11 <sup>th</sup> , 2011.....	61
November 30 <sup>th</sup> , 2011.....	62
December 7 <sup>th</sup> , 2011 .....	62
January 18 <sup>th</sup> , 2012 .....	63
January 25 <sup>th</sup> , 2012 .....	64

February 1 <sup>st</sup> , 2012 .....	64
February 8 <sup>th</sup> , 2012 .....	65
February 15 <sup>th</sup> , 2012 .....	65
February 22 <sup>nd</sup> , 2012.....	66
<b>Appendix H: Minutes of the Advisor Meeting .....</b>	<b>68</b>
September 2 <sup>nd</sup> , 2011 .....	68
September 9 <sup>th</sup> , 2011 .....	69
September 16 <sup>th</sup> , 2011 .....	71
September 23 <sup>rd</sup> , 2011 .....	72
September 30 <sup>th</sup> , 2011 .....	74
October 7 <sup>th</sup> , 2011 .....	75
October 28 <sup>th</sup> , 2011.....	75
November 5 <sup>th</sup> , 2011.....	76
November 11 <sup>th</sup> , 2011.....	76
November 30 <sup>th</sup> , 2011.....	77
December 7 <sup>th</sup> , 2011 .....	78
January 18 <sup>th</sup> , 2012 .....	79
January 25 <sup>th</sup> , 2012 .....	80
February 1 <sup>st</sup> , 2012 .....	80
February 8 <sup>th</sup> , 2012 .....	80
February 15 <sup>th</sup> , 2012 .....	81
February 22 <sup>nd</sup> , 2012.....	82
<b>Appendix I: Proposal PowerPoint .....</b>	<b>83</b>
<b>Appendix J: Training Manual .....</b>	<b>96</b>
<b>Appendix K: Final PresentationPowerPoint .....</b>	<b>124</b>

## **Acknowledgements**

The project team: Matthew Dodd, James Ham, Alexzandria Haney, and James Post, would like to acknowledge our Project Sponsor Velir for collaborating us and providing us necessary action or complete our project. We would like to thank our liaison Tiven Weinstock and the rest of the Velir management staff. Finally we would like to thank out project advisor Professor Eleanor Loiacono for her support and guidance through our project.

## **Abstract**

This project consisted of the design and development of a business reporting software to be used by Velir Studios. The software tool allows the employees at Velir Studios to quickly and effectively obtain important business information such as employee time cards, project budgets and resource allocation, invoice reporting and project burn-rate trends. By implementing this piece of software, Velir employees will be able to quickly export the data they wish to access into an excel document without having to manually enter each piece of information separately. The addition of the reporting software into the Velir management department will not only expedite the overall reporting process but will save them time and money in the future.

## Authorship

This report represents the combined work of Alexandria Haney, James Ham, James Post, and Matthew Dodd. Our MQP team collaborated to produce the final system for Velir. Most of the tasks required a joint effort from all the members of the team however some tasks were separated in order to complete the project on time. Matthew Dodd and James Ham focused on the system coding and Alexandria and James Post focused on the documentation.

Section #	Section	Author
	Acknowledgements	Alexandria Haney
	Abstract	James Post
	Authorship	Alexandria Haney
	Executive Summary	James Post
1.1	Velir background	James Post
1.2	MQP background	James Post
1.3	Problem Statement	James Post
1.4	Problem Objectives	James Post
2.1	Harvest Background	James Post
2.2	FogBugz Background	James Post
2.3	System Development Life Cycle	James Ham
2.4	Planning	James Ham
2.5	Analysis	James Ham
2.6	Design	James Ham
2.7	Implementation	James Ham
2.8	Methodology Options	James Ham
2.8.1	Waterfall Development	James Ham
2.8.2	Rapid Application Development	James Ham
2.8.3	Agile development	James Ham
2.9	Decisions	James Ham
2.9.1	Waterfall Development	James ham
3.1	Analyzing Feasibility	James Post
3.1.1	Economic Feasibility	James Post
3.1.2	Organizational Feasibility	James Post
3.1.3	Developing the Work Plan	Alexandria Haney
3.2	Staffing the Project	Alexandria Haney
3.3	Risk Assessment	James Post
3.4	Project Scope	James Post
3.4.1	Not Identifying the Problem	James Post
3.4.2	Technical Errors	James Post
3.4.3	Users Unable to Integrate	James Post
4.1	Interview Process	Matthew Dodd
4.2	Key Points Breakdown	Matthew Dodd, James Ham



4.3	Key Points Breakdown Table	Matthew Dodd, James Ham
5.1	Design Requirements gathering	Matthew Dodd
5.2	Design Implementation	Matthew Dodd
5.3	Design Mock-up	Matthew Dodd
5.4	Report Mock-up	Matthew Dodd
5.5	Proposal Presentation	Matthew Dodd
5.5.1	Noted Changed from Proposal Presentation	Matthew Dodd
5.6	Update to Velir	Mathew Dodd
6.1	User Documentation	Matthew Dodd, James Post
6.2	System Documentation	Matthew Dodd, James Post
6.3	Conversion Plan	Alexandria Haney
6.4	Training Plan	Alexandria Haney
	Glossary	Alexandria Haney
	Appendix A	Alexandria Haney
	Appendix B	James Post
	Appendix C	Alexandria Haney
	Appendix D	Alexandria Haney
	Appendix E	Alexandria Haney, James Ham, James Post, Matthew Dodd
	Appendix F	Alexandria Haney, James Ham, James Post, Matthew Dodd
	Appendix G	Alexandria Haney, James Ham, James Post, Matthew Dodd
	Appendix H	Alexandria Haney, James Ham, James Post, Matthew Dodd
	Appendix I	Alexandria Haney, James Ham, James Post, Matthew Dodd
	Appendix J	James Post, Matthew Dodd
	Appendix K	Alexandria Haney, James Ham, James Post, Matthew Dodd

## Executive Summary

This project consisted of the design of a business reporting software for Velir Studios, a renowned web-development company based in Somerville, MA. Prior to this project, employees at Velir found it difficult to create relevant reports using their own reporting software, Harvest. Lack of experience and know-how for the Harvest software made creating these reports repetitive and overall very time-consuming. The goal was to create a multi-functional reporting tool that could be used by the Velir employees to expedite this report generating process.

The project began in August of 2011 and progressed in phases starting with planning followed by design and transitioning into implementation, as per the Software Development Life Cycle (SDLC). The initial project proposal was presented to the Velir team at the conclusion of the design and analysis phase in mid-December. Upon receiving feedback on the proposal, the team began re-designing the software to meet the requirements outlined by the Velir management team. Finally with the designed system in place, documentation was created, and an implementation plan was created for Velir.

In order for the project team to better understand the specific business needs of Velir with the Harvest time tracking and reporting software, interviews were conducted with key employees. Interviews generally took place on-site at Velir's office, but were also conducted via Skype if accommodations were necessary for employee travel. This requirements gathering method assisted the team to learn about existing workflows and determine which reporting features were most important to the employees.



Fig. 1 - An example of a Power Pivot template dashboard

After discussions with Velir employees, the project scope was changed to focus more directly on the manipulation of data once outside of Harvest. This led to PowerPivot, which provides extensive functionality to create powerful reports. Fourteen PowerPivot report templates were generated that help illustrate the power of both what data was already present in Harvest and what PowerPivot is capable of creating, as seen above in Fig 1. An Excel add-in that assists in obtaining data from Harvest was additionally constructed to help automate redundant processes.

Finally with the new Excel workflow in place the team created proper documentation, implementation strategies, a training plan, and a conversion plan. These reports were delivered to Velir along with the final proposal to help assist with integrating the developments into the existing workflow and providing future areas for development.

# Chapter 1

## Introduction

This project is being completed in partial fulfillment of our Bachelor of Science degree requirements at Worcester Polytechnic Institute (WPI). This document outlines the project details and highlights the application of the theoretical material learned in our course work. In the following chapter we describe Velir, our sponsor company, the requirements of the Major Qualifying Project (MQP), and a brief overview of the objectives and background.

### 1.1 Velir Background

Velir Studios is a full service web agency that has established itself as an innovator of highly customized web-based solutions. Velir was founded in the year 2000 at the peak of the dotcom boom with the increasing number of companies wanting to get online. The founder, Mark Gregor, decided to quit his job and pursue web design full time with three other friends. Having developed their own unique methodology for implementing large scale, high profile and complex websites, they have established themselves as a venerated company for quality web design services among major non-profit organizations. With their wide range of expertise including content management and data visualization, they have excelled in launching sites with over thousands items of content and a wide range of custom functionality.

Velir has had the opportunity to work with some of the largest non-profit organizations in the country. One of their recent projects was designing a new blog for the Bill and Melinda Gates Foundation. Impatient Optimists, the name of the blog, provides a wide variety of articles, stories and multimedia on the works of the Bill and Melinda Gates Foundation worldwide (see Fig. 2). The Brookings Institute, another high profile client of Velir, was recognized by the Sitecore Site of The Year as the Best Non-Profit Site for 2008. The quality of work that Velir has consistently produced has caused much of its success to have been a result of word-of-mouth from their satisfied clients.

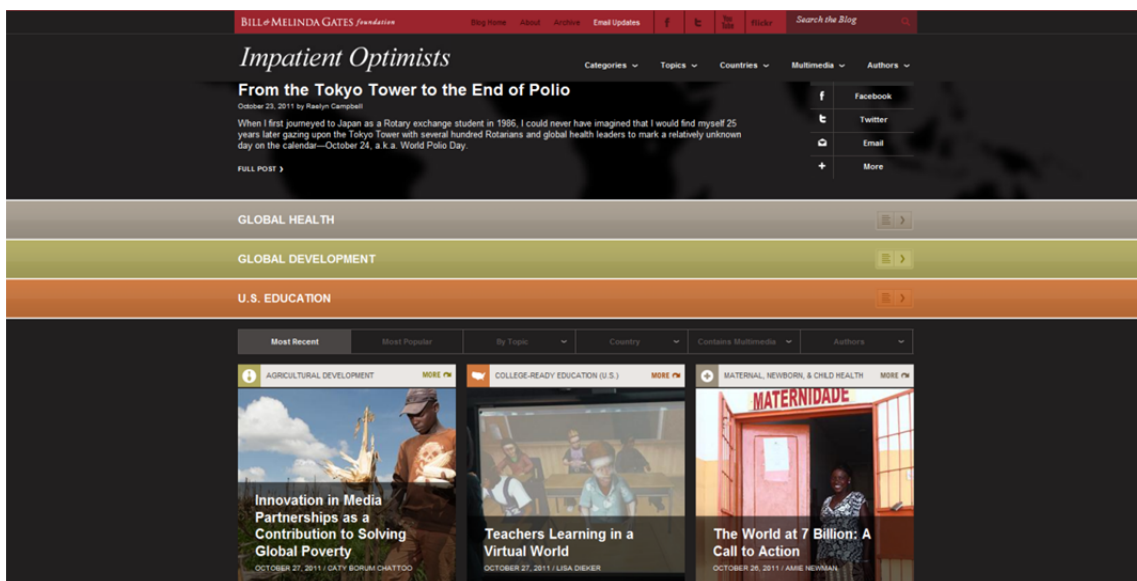


Fig. 2 - Impatient Optimists Website (Bill and Melinda Gates Foundation, 2011)

Velir's business model focuses greatly on meeting client needs and customer satisfaction. During the development process they work closely with their customer to ensure every need is met and their site request is carried out flawlessly. Having utilized this client-based development process, Velir has made its mark in the web development industry and has demonstrated that it is here to stay.

As a medium sized web development company, Velir employs a considerable staff of employees for developing the innovative web solutions for which they are known for. As with any company, Velir must maintain strict records of employee time sheets, current and future projects within the company and client accounts. Generally, these functions that occur within a company are managed through a professionally designed information system. For Velir however, these business operations have not been functioning to their expectations. As a team of students majoring in Management Information Systems, we have been tasked with this MQP to determine the cause of and implement a solution to this business problem.

## **1.2 MQP Background**

The Major Qualifying Project (MQP) is the capstone of every student's academic experience at WPI. Under the guidance of academic advisors, students are presented with a real-world problem relative to their specific major. By utilizing the knowledge and skills developed over the course of their education at WPI, students must develop and implement a plan to solve the problem through extensive research and carry out the solution effectively. Depending on the nature of the problem, the approach each MQP team chooses to determine a solution may vary considerably. Examining similar cases from published documents or conducting interviews with professionals in relative academic fields are common methods for students to develop a better understanding of their project objectives. Once an effective approach is outlined and approved by an academic advisor, the students begin developing the solution utilizing the technical and organizational skills learned in the classroom. The MQP allows students to experience firsthand a real world problem in their particular job field after college.

WPI's motto, "Lehr und Kunst", roughly translated to "Theory and Practice", is a representation of the institute's strong belief of incorporating hands-on practice in conjunction with the theoretical portion of one's education. Depending on the nature of the MQP, the results may go on to be published or utilized by a corporate sponsor. In the case of the Velir project, we foresee the sponsors employing the team's solution to improve the business functions within their company.

## **1.3 Problem Statement**

Velir Studios maintains regularly updated records of employee time sheets, client invoice and budget reports. Employees are required to track of the amount of hours they spend on projects to allow managers to see which particular projects are on or behind schedule. Depending on the number of hours spent on individual projects, managers would be able to determine if additional employees are needed. Additionally, budget reports allow managers to see how effectively resources are being utilized in order to stay within each project's projected budget requirement.

Despite this effective approach to monitoring employee and budgetary records, many factors exist that hamper efficiency and negatively influence the performance of those working at Velir. Creating budget reports and keeping track of employee hours has become an extremely tedious task for managers, forcing them to spend additional time compiling data that should only take a fraction of the time to be carried out. One example of the time-consuming nature of these budget reports is creating them in excel. Managers are forced to copy figures into a spreadsheet one piece of data at a time, rather than have the information transfer over automatically.

Velir Studios utilizes a software called Harvest for its time tracking, online invoicing and project reporting needs. Fig. 3 is an example of the report generating interface of Harvest. The system unfortunately, is underutilized and is not meeting the expectations of the Velir managers and developers. The Velir management team has tasked a team of students from Worcester Polytechnic Institute (WPI) to research and develop a new and improved method for using Harvest for their Major Qualifying Project (MQP). The team will study the current usage and needs of Velir managers in order to enhance the tracking and reporting features available to them within Harvest. This may include building a custom application using the Harvest Application Programming Interface (API), reworking existing reports already built into Harvest or utilizing third-party applications for better report generation.

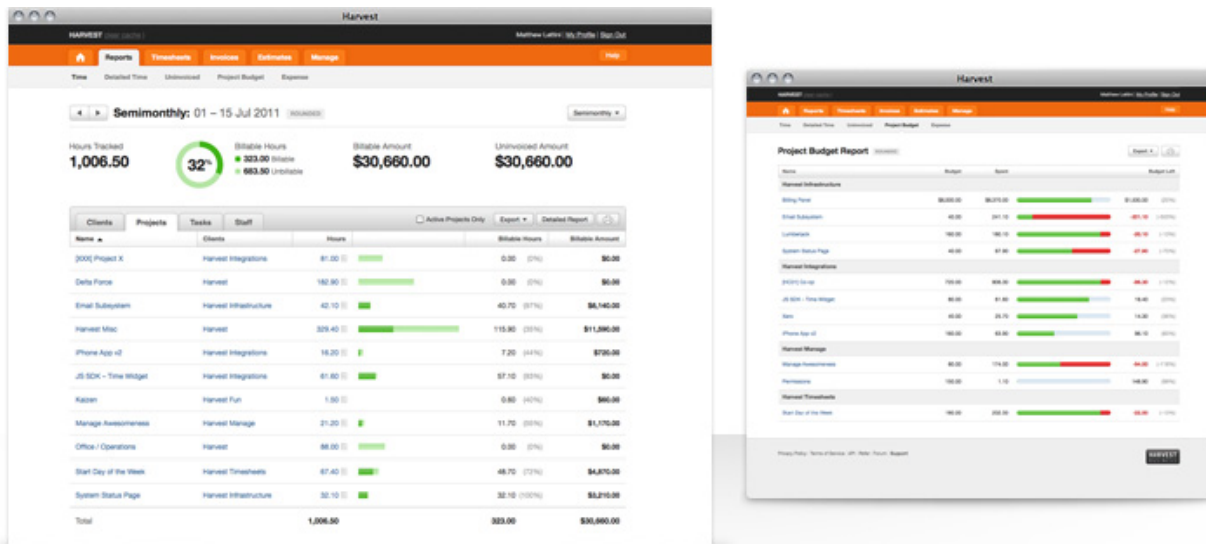


Fig. 3 - Harvest Interface ([www.getharvest.com/features/reports](http://www.getharvest.com/features/reports))

The first step that the project team took to begin producing measurable results at the request of the Velir management team was increasing their knowledge of the current functionality available within Harvest after establishing a basic understanding of the software, the team shifted its focus to further developing their understanding of how accurately Velir utilized Harvest for their data storage and report-generating needs. This hands-on approach to understanding Velir's usage of Harvest was supplemented with personal interviews of key Velir employees to better grasp the variety of issues they have been facing with the software.

## 1.4 Problem Objectives

As initially identified to us by Velir, the following is a preliminary list of desired reports:

- Invoice Report template
- Roll up hours by project and department each month
- Determine billable/non-billable hours for each employee
- Track employees who are trending below or above 40 hours per week
- Determine burn-rate for projects
- Determine how accurate our project estimates are
- Flag when projects expire
- Ability to initiate request for resources aligned to SOW/existing Project Work
- Ability to fulfill resources to requests
- Ability to view resources to requests
- Ability to view resource allocation/forecasting over date ranges
- Ability to manage allocations
- Notifications
- Capability to define, for a given resource, the percentage breakdown on where time should be spent for a given week/month, and then report on if percentage is exceeded or not met for a given week/month.

The ultimate goal for this project is to successfully incorporate the above mentioned functions into an easy-to-use report generating software for the Velir employees. By also incorporating the individual needs of each Velir employee based on personal interviews, we will successfully produce a usable and dynamic tool. Upon the conclusion of preliminary research as to how effectively Velir currently utilizes Harvest, the team provided a gap analysis indicating the specific areas of the software underutilized by Velir. This analysis was used to create the systems request of the modification proposed to better meet the needs of the Velir management team.

Now that a brief overview of the Velir MQP has been explained, we will shift the focus to include much more specific aspects of the project. In the following chapters we will elaborate further on our method of approach, our analysis of all factors that could affect the project outcome, and the design requirements for creating a functional tool for Velir.

## Chapter 2

### Literature Review

The purpose of this Literature Review is to bring readers up to date with current literature on the topic and form the basis for future goals such as further research and analysis.

#### 2.1 Harvest Background

Since Velir currently collects important billing and time-allocation data through Harvest it is important for the team to understand it in order for the requested reports to be properly developed. In order for the MQP team to understand how reports are created and accessed in Harvest, they would need to develop a sufficient understanding of the software and all of the features it includes.

Harvest is a business time tracking software designed to simplify and expedite the time tracking and invoice reporting processes that are necessary in any modern business. The Harvest Company and similarly named time tracking software was founded in 2006 by Danny Wen and Shawn Liu. Unable to find a well-designed and user friendly time tracking software, the two web designers set out to create their own.(Harvest, 2011)

Today, Harvest is used by thousands of customers in over one hundred countries worldwide. The software serves the time tracking and billing needs of every sized company from small businesses to large departments within Fortune 500 companies. Harvest is very useful for managing time sheets and invoicing is demonstrated by a recent survey where 98 percent of Harvest customers stated that they would recommend the software.

Other notable figures of Harvest include:

99.9 percent Harvest application uptime to ensure product reliability

\$574,536,197 billed through Harvest

68,167,381 hours tracked in Harvest

(Harvest, 2011)

Headquartered in New York City, the Harvest Company is an extremely profitable, independent startup company. Harvest frequently receives feedback from their users to solve any new problems that arise and constantly work to improve their application for customers.

#### 2.2 FogBugz Background

There is third-party software that is used in conjunction with Harvest for keeping track of software bugs and other issues relative to their web development work. The software, known asFogBugz, is an integrated web-based project management software utilized by Velirfor its bug tracking and project management features. Fig. 4 is an example of the bug-tracking interface utilized by the software.



The screenshot shows the FogBugz web application interface. At the top, there is a navigation bar with the FogBugz logo and various menu items like 'List Cases', 'New Case', 'Send Email', 'Filters', 'Schedules', 'Discuss', and 'Wiki'. Below the navigation bar, there is a search bar and a filter section showing 'assignedto:"me" project:"Frogger: The Legend Continues" orderby:"Priority" View:Outline'. The main content area displays a list of bug cases organized into three priority groups: 'PRIORITY 1 - MUST FIX CASES', 'PRIORITY 2 - MUST FIX CASES', and 'PRIORITY 3 - MUST FIX CASES'. Each case is represented by a row in a table with columns for Case ID, Title, Status, Opened By, Remaining time, Priority, and Assigned To.

Case	Title	Status	Opened By	Remaining	Priority	Assigned To
190	Flickering truck sprites	Active	Demo Master	75 hours	1 - Must Fix	Alan Turing
197	Buses don't vanish properly on left edge of	Active	Demo Master	15 hours	1 - Must Fix	Alan Turing
291	Gas-up feature for jet pack	Active	Demo Master	22.5 hours	1 - Must Fix	Alan Turing
<b>PRIORITY 2 - MUST FIX CASES</b>						
198	Jumping sound repeats randomly	Active	Demo Master	37.5 hours	2 - Must Fix	Alan Turing
201	Create sprite for dead frog	Active	Demo Master	7.5 hours	2 - Must Fix	Alan Turing
<b>PRIORITY 3 - MUST FIX CASES</b>						
202	Create sprite for half-dead frog	Active	Demo Master	7.5 hours	3 - Must Fix	Alan Turing
203	Research frog jumping mechanics	Active	Demo Master	15 hours	3 - Must Fix	Alan Turing
199	Record sound of an actual frog jumping	Active	Demo Master	3 hours	3 - Must Fix	Alan Turing
200	Implement super jump	Active	Demo Master	92.5 hours	3 - Must Fix	Alan Turing
254	Power-up icon	Active	Demo Master	79 hours	3 - Must Fix	Alan Turing
259	Create color sketch	Active	Demo Master	75 hours	3 - Must Fix	Alan Turing
260	Pixelize sketch	Active	Demo Master	4 hours	3 - Must Fix	Alan Turing
255	Calibrate jump distance	Active	Demo Master	3 hours	3 - Must Fix	Alan Turing
256	Super jump noise	Active	Demo Master	10.5 hours	3 - Must Fix	Alan Turing
257	Sample rocket sounds from NA	Active	Demo Master	7.5 hours	3 - Must Fix	Alan Turing
258	Encode in MIDI	Active	Demo Master	3 hours	3 - Must Fix	Alan Turing
192	"Bleep" sound is a bit too "bloopish"	Active	Demo Master	37.5 hours	3 - Must Fix	Alan Turing
193	Finish car speed algorithm	Active	Demo Master	112.5 hours	3 - Must Fix	Alan Turing
261	Play test games at various difficulty l	Active	Demo Master	75 hours	3 - Must Fix	Alan Turing
262	Fix acceleration problem in level 7	Active	Demo Master	37.5 hours	3 - Must Fix	Alan Turing
194	Work with Anita on system requirements	Active	Demo Master	37.5 hours	3 - Must Fix	Alan Turing

Fig. 4 – FogBugz ([www.fogcreek.com/fogbugz/](http://www.fogcreek.com/fogbugz/))

First released in 2000 as an internal bug tracking tool for its developer Fog Creek Software, FogBugz has since expanded to include customer support and evidence based scheduling features. Other features of the software include a built-in wiki to assist with technical documentation, built-in discussion groups, email integration with Visual Studio, and time tracking with schedule estimation tools. (Fog Creek Software, 2011)

## 2.3 Systems Development Life Cycle (SDLC)

The Systems Development Life Cycle (SDLC) is the process of understanding how an information system can support business needs, designing the system, building it, and delivering it to users. Similar to building a house, there are four main phases of development; Planning, Analysis, Design, and Implementation.

### 2.4 Planning

The objective of the planning phase is to understand why an information system (IS) should be built and how the development team will go about constructing it. A system request summarizes a business need and explains how a system for that particular need could create business value. The IS Department then works with the project sponsor to determine the feasibility of such a project. They begin by examining the technical feasibility (can we build it?), if yes, then the economic feasibility (will it provide business value?) and, if yes, finally the organizational feasibility (will it be used?) (Dennis, Wixom, & Roth, 2010). Once all the steps are completed, the project can move on to step two of the planning stage, project management.

During project management, the project manager creates a work plan, staffs the project, and puts techniques in place to help the project team control and direct the project through the entire SDLC. The deliverable is a project plan that describes how the team will go about development (Dennis, et al., 2010).



## 2.5 Analysis

While the planning phase addressed the question of why a system should be implemented, the analysis phase identifies and answers the other questions of who, what, when, and where. Who will use the system? What will the system do? When and where will the system be used? The analysis is broken down into three sub phases; analysis strategy; requirements gathering; and system proposal (Dennis, et al., 2010).

An adequate analysis strategy will help guide the project team's efforts throughout system development process. It starts with an in-depth review of the current system (the as-is system) and the problems in its functionality. After the as-is system is analyzed, the team will then develop and propose a new one, (the to-be system).

The team will then conduct a process known as requirements gathering. The analysis of as-is system, in conjunction with the input from stakeholders, will lead to the development of a new system concept. Once a system concept is created, the team prepares a business analysis that describes, in depth, how the business will operate in conjunction with the proposed system.

Finally, all the documents are combined into a system proposal. The system proposal is a formal document that is presented to the project sponsor and key decision makers who describe the results of the entire analysis phase. The document is then reviewed and the system is either moved into the design phase or reverted back for further revisions.

## 2.6 Design

The design phase determines exactly how the system will operate. This includes the hardware, software, and network infrastructure as well as the user interface, forms, reports, programs and databases that will be required. This is accomplished in four steps. The final deliverable for the design phase is a system specification document that will be handed to the programming team for development.

The first step is to create a design strategy. The design strategy determines who will make the system. There are three options: Corporate development (company's own programmers), outsourcing (usually the consulting firm), or purchasing an existing software package (Vendor) (Dennis, et al., 2010).

The next step is the architecture design and interface design. The architecture design covers what hardware, software, and network will be used. Often, the system will augment existing infrastructure, and thus this design will detail the changes necessary to meet the requirements. The interface design specifies how the users will utilize the system by outlining the "paths" users will be able to take. This includes navigation, forms, and reports that the users will be accessing.

The third step is to define data storage. What data will be stored and where they will store it (Dennis, et al., 2010). The final step is the program design. The program design encompasses what programs need to be written and what each program will do (Dennis, et al, 2010). Once the program design is finished, all the documents are then combined into a system specification and handed off to the programming team for implementation.

## 2.7 Implementation

The implementation phase is the phase where the system is actually built, or purchased in the case of a packaged software design (Dennis, et al., 2010). The implementation is carried out in three steps; Construction, installation, and support.

During the construction sub phase, the system is built and tested. Testing plays a critical role because it is often very costly resource-wise to fix bugs and defects. Once the system is constructed, it is installed. Installation can be as simple as turning off the old system and turning on the new one or it can be as complex as implementing both the old and new system simultaneously until the new system is finally approved after run-time testing. The method to be used for installation is determined by a conversation strategy that factors in requirements, technology, system complexity, reliability needs, schedule, and schedule visibility. Equally important is the training plan which will determine the most effective way to teach the users how to manage the new system.

Finally, the team establishes a support plan that includes a post-implementation review as well as a systematic method to identify major and minor changes that need to be addressed (Dennis, et al., 2010).

## 2.8 Methodology Options

While the SDLC provides a foundation for the processes used to develop a system, a methodology is a formalized approach to implementing the SDLC. There exist various methodologies that differ in terms of phase progression through the SDLC.

### 2.8.1 Waterfall Development

In waterfall development, progression through the SDLC is done sequentially moving from one phase to the next (See Fig. 5 below). While it is possible to go back from a phase to the one before it, it is very difficult to do so and, as such, not done often. The pro of waterfall development is that requirements are identified well in advance of any actual programming and that the requirements do not change as the system progresses. The cons of waterfall are that there is no flexibility in design once the programming has started as well as the amount of time between project sponsorship and project completion. The huge gap between project start and project end, with little or no input during the programming process, will often produce a project that requires one or more extensive and time-consuming changes. Also, due to Moore's law, the landscape of technology changes rapidly. This rapid change often leaves large projects that do decide to implement waterfall methodology with a system that is completed in an already outdated environment.

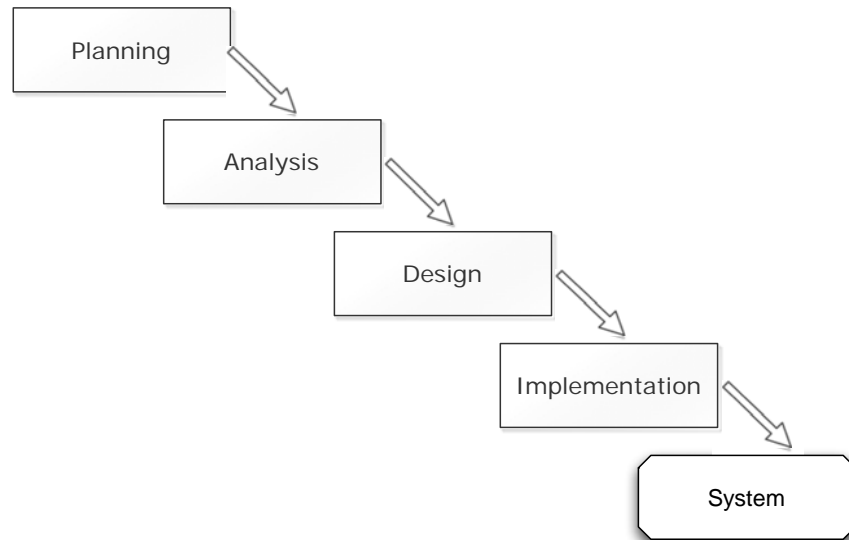


Fig. 5 - Waterfall Development (Dennis, et al., 2010)

### 2.8.2 Rapid Application Development (RAD)

Rapid application development is actually a collection of methodologies that were combined with the weaknesses of waterfall development in mind. The goal of RAD is to accelerate, through special techniques and computer tools, the analysis, design, and implementation phases. This allows the programming team to receive feedback from users which results in a final product that users have already tested more extensively than possible in waterfall development. One of the shortcomings of RAD is that user expectation will rise as they become more familiar with the system which results in a dramatic rise in requirements (feature creep). RAD can be conducted in one of three main ways, iterative development, system prototyping, and throwaway prototyping.

Iterative development takes an approach of mini waterfall development (See Fig. 6 below). By accelerating the waterfall cycle and reducing the scope, the programming team becomes much more flexible in terms of its ability to respond to, and implement, any additional user feedback. System prototyping is a response to inadequate requirements at the time of development. Prototyping allows the users to evaluate the features of the system until the prototype is deemed to be good enough for installation. However, the same strengths of prototyping are also its weaknesses. Due to its nature of being built upon incomplete requirements, the programming of the actual required features may not begin until well into development. Lastly throwaway prototyping is a form of prototyping whose function is to explore options and design alternatives. Once the effectiveness of the prototype is measured, it is thrown away. While this process is more time-consuming, throwaway prototyping often produces more stable and reliable systems.

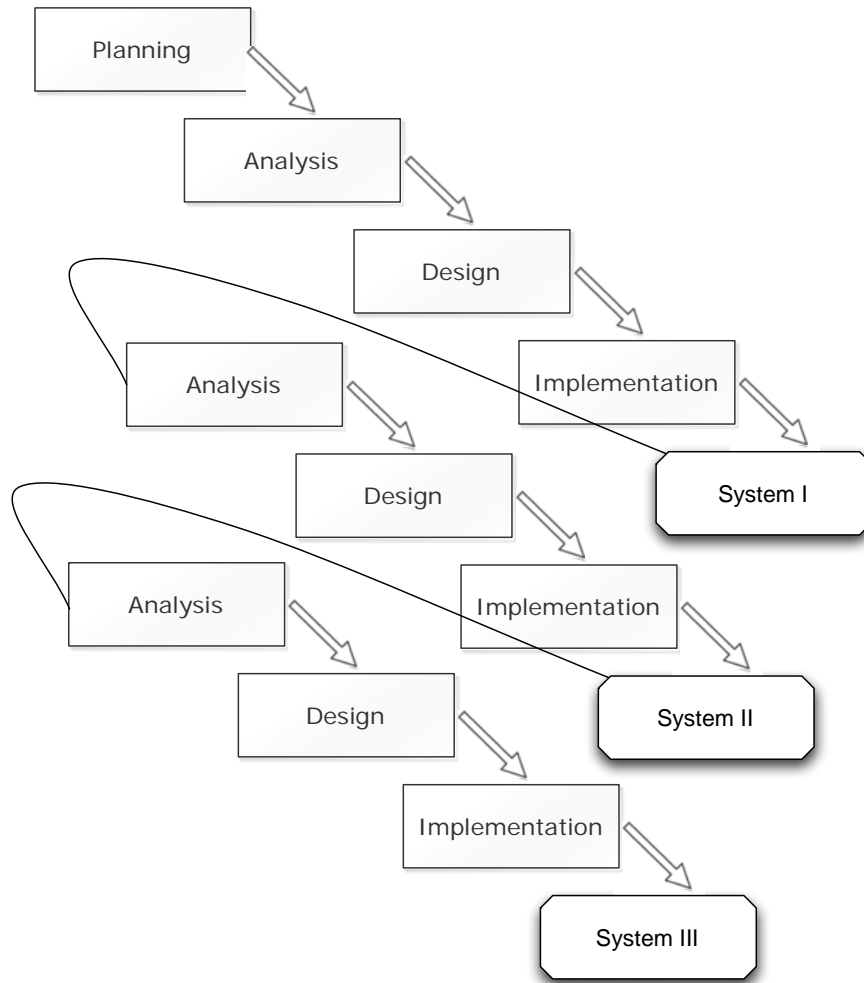


Fig. 6 – Rapid Application Development (Dennis, et al., 2010)

### 2.8.3 Agile Development

Agile development's focus is to streamline the SDLC as much as possible. It achieves this through simple short tasks and face to face communication. This allows programmers to receive feedback almost instantly and address any issues in the next iteration (See Fig. 7 below). Iterations are typically one to six weeks, with an average of four weeks. Due to the fast paced nature of agile development, teams are kept small and must adhere to strict programming standards (common naming convention, descriptions, and documentation). Teams meet every morning to assess each other's progress and identify key issues. Features are assigned to programmers from the backlog by the project manager. The goal of each cycle is to increase the potential deliverable system. When implemented effectively, agile development teams are able to deliver systems faster than RAD.

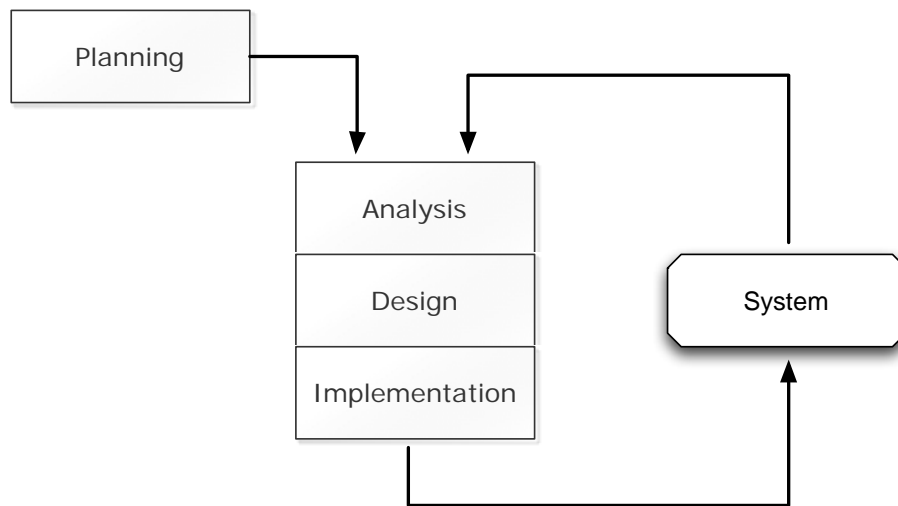


Fig. 7 - Agile Development (Dennis, et al., 2010)

## 2.9 Decision

For this next step, it was important to decide which of the SDLCs the development team would implement. A careful analysis of the pros and cons of each of the SDLCs needed to be completed. Once the pros and cons were analyzed, the team needed to choose which SDLC best met the project requirements.

### 2.9.1 Waterfall

We created a chart (Table 1 below) that highlights the strengths and weaknesses of each and every SDLC. As a team we then sat down and discussed the potential probability for the worst-case scenarios that could happen. Ultimately, we decided to go with waterfall development, despite the lack of flexibility, due to the clear requirements of the project and low probability of a requirements change.

Methodology	Pros	Cons
Waterfall	<ul style="list-style-type: none"> <li>Requirements do not change during coding</li> </ul>	<ul style="list-style-type: none"> <li>Limited flexibility once coding has started</li> <li>Gap in time between project conception and project completion</li> </ul>
RAD	<ul style="list-style-type: none"> <li>Extensive testing by user during development</li> </ul>	<ul style="list-style-type: none"> <li>Potential for a dramatic rise in requirements during development</li> </ul>
Agile	<ul style="list-style-type: none"> <li>Programmers receive immediate feedback from users</li> </ul>	<ul style="list-style-type: none"> <li>Effectiveness of an agile decreases as the number of programmers increase</li> </ul>

Table 1 - Methodology Pros and Cons for Velir MQP

## Chapter 3

### Planning

Having chosen the waterfall method for the SDLC, a proper analysis of feasibility was necessary to determine whether or not the project should be undertaken. Table 1(above) provides a representation of the pros and cons that were considered when determining which type of methodology to choose.

#### 3.1 Analyzing Feasibility

Conducting a feasibility analysis was necessary for determining the overall strengths and weaknesses of a project or venture within an organization. Accurately assessing possible constraints that are critical for the project's success would help determine likely project outcomes ahead of time. By forming these predictions ahead of time, stakeholders are given additional time to make important decisions to ensure the project stays on track. In this section, we elaborate on the technical, economic and organizational feasibility for this MQP.

##### 3.1.1 Technical Feasibility

Determining the technical feasibility of this project meant the project team needed to assess the extent to which we could successfully design and implement a system that met the requests outlined by the Velir management team. In order to properly facilitate the technical needs pre-defined by Velir, the team built sufficient knowledge of the Harvest software and the applications from which it generates its reports, as well as gained access to the reports themselves. This required permission from the Velir management team as well as the enforcement of proper security protocols to ensure the safety and security of Velir business intelligence. Harvest processes a considerable amount of information which is processed for three primary functions: employee time tracking, invoicing and financial reporting. Given the team of four students, we needed to develop a familiarity with the software and its core functions. Developing an understanding of Harvest was necessary for providing the Velir team with recommendations to better utilize the software for their reporting needs.

##### 3.1.2 Economic Feasibility

Determining the economic feasibility is essential in that it provides a clear analysis of how the costs associated with a project are measured against the benefits that it provides. For this particular project, assessing the perceived benefits of the application required knowledge of how much time is spent by the Velir harvest users to complete their required responsibilities. Comparing the number of hours per week required to complete their work requirements with the number of hours they would require after utilizing the tool developed by the student team gave a reasonable estimate of the time and money saved.

The Project team was able to produce a reasonably accurate assessment of the financial savings expected by utilizing our report generating tool by estimating the hourly earnings of the primary harvest users at Velir. With the information gathered from the interviews of the primary Harvest users at Velir, the team was able to determine the average salaries and subsequent hourly earnings based on the

industry averages from available sources online. By estimating the hourly savings of each employee based on the amount of time they spend using harvest, an estimated weekly savings of \$900 was concluded. (Appendix D) This savings amount however, does not include the estimations for the current Velir Chief Executive Officer (CEO) and Chief Operating Officer (COO). Due to the high degree which the CEO and COO salaries skew the results and the fact that they do not spend a significant portion of their time using the Harvest software the team felt it was necessary to exclude them from the primary users. However, for informative purposes, when taking the salaries of the CEO and the COO into consideration, the weekly time savings increases to \$1692.07.(Kenexa, 2011)

An additional consideration when assessing the economic feasibility of this project is the perceived time and dollar savings incurred from choosing to have this software developed by the WPI project team rather than a commercial software development firm. Had Velir chosen a commercial software development firm to develop this report generating tool, they would have been required to provide compensation equivalent to the amount of work put into this project by the entire project team. The MQP project team consisted of four students working an average of sixteen hours each week for twenty-one weeks. This equates to one thousand three hundred and forty-four hours total for the entire team. In order to produce a realistic cost that Velir would incur had they chosen to pursue this software through a professional firm, the team made estimated based on a team of three software developers and a software engineering manager. According to Salary.com, the median salary for a standard software developer in Boston is about \$63,000, or roughly \$30 per hour. The median salary for a software engineering manager is about \$130,000, or about \$62.50 per hour. In calculating the expected software cost, we use the assumption that the developers spent the same amount of time per week creating the software as the project team and the project manager spent about half due to additional managerial responsibilities. When the hourly wages were multiplied by the hourly earnings for each member of the project, a total compensation of \$40,740 was calculated without taking into consideration any additional fees or development costs.

Compared to the initial sum of \$10,000 which Velir originally invested into this project, it is clear that they are saving a considerable amount of capital by choosing to have this software produced by the WPI project team rather than professional developers. Without considering any additional development costs associated with designing this business software, Velir would be saving roughly \$31,000 in capital.

### **3.1.3 Organizational Feasibility**

Organizational feasibility is used to assess how well a system would ultimately be incorporated into the operations of the organization. It also includes how well it would be accepted by the users in said organization. The focus of this analysis is to ensure the goals of project are properly aligned with the objectives of the business. Velir outlined its objectives in this project as well as presented us with a preliminary list of goals that wished to be completed. Much of the desired reporting modifications requested by Velir were made out of need for increased efficiency and time-management. Should the developed system effectively manage employee time-slots and expedite report generation, it would be easily and effectively incorporated into the current operations at Velir Studios.

### **3.2 Developing the Work Plan**

After determining realistic feasibility reports specifying estimates for the return on investment and capital savings by working (see Appendix B); the team developed a viable work plan. It was decided that the best way to do this would be to create a Gantt Chart. The Gantt Chart would layout each task we needed to perform in each term and how long we had to complete the given task. This would help make sure we were not starting tasks that could not be completed until previous tasks were finished.

We had twenty-one weeks to complete the project and in order to finish the SDLC we needed to organize our time efficiently and effectively. The first seven weeks focused primarily on the planning stages, the following seven were spent carrying out the analysis and design portions of the project and the final seven weeks were focused on the implementation stage. Because of the short amount of time we needed to make sure that we set realistic goals in a feasible amount of time. After completing the work plan our next objective was adequately staffing the project.

### **3.3 Staffing the Project**

In order to ensure the project was completed on schedule the team needed to make sure we had enough people to work the project. We decided that we would split the research and interviewing up evenly. At the interviews at least two people were present but most interviews had all four group members. Upon the beginning of the implementation phase of the project, it was decided that the team would divide up the work load between two even teams. James Post and Ali would focus on developing the project documentation and explanatory video. The system design and functionality would be the focus of Matt and James Ham. The two groups would consistently keep track of the each other's new developments to maintain project progress as a whole.

### **3.4 Risk Assessment**

An adequate risk assessment provides an objective overview of potential factors that could negatively influence the results of a particular project or venture. In the following sections, we identify each potential risk factors associated with the Velir Major Qualifying Project.

#### **3.4.1 Project Scope**

One consideration in developing a functional time-analysis tool for Velir is determining the proper scope for the project. During the development process, new ideas may come to fruition that could affect the overall direction of the project. Regardless of how beneficial any late speculation may appear at first glance, it was important to maintain a strict set of objectives throughout the application's development process. If new steps were continually added to the project objectives to further benefit the application, the team would find itself overloaded and unable to properly execute the required tasks. This is one of the reasons why the team felt the waterfall method was better suited for this particular project. Based on the expectations and needs of the Velir employees, the project team was able to determine a set of realistic and attainable functions that our application would need to follow in order to meet those expectations. The team had originally intended to avoid scope-creep during the initial phase of the project but due to unforeseen scheduling changes scope-creep did occur.



### **3.4.2 Not identifying the problem**

During the early planning stages of the application development process, the most important focus was how we are specifically meeting the needs of the Velir employees. As the project sponsor, they are the individuals who would directly benefit from the final outcome of this teams work. Having clearly outlined their specific needs as guidelines for developing the application, the project team needed to identify the problems associated with these needs not being met. Had the team incorrectly identified the business problems associated with the issues outlined by Velir, the application would not have functioned as requested and thus, Velir would have been unable to utilize it.

### **3.4.3 Technical errors**

A potential risk that faced this project common with many applications was technical problems with the software. Despite having properly identified the needs of the users and implementing the application accordingly, glitches in the software and other unforeseen technical problems could have considerably impacted the results. In designing the application, careful attention was placed on where particular data was accessed and used. Monitoring the type of information being accessed not only ensured the functionality of the software but also prevented errors resulting from invalid data. By paying close attention to the information processed by the application during the designing process, the team minimized the risk of software related technical issues.

### **3.4.4 Users unable to integrate**

With the application implementation process developing accordingly, another risk that could have potentially prevented the Velir employees from properly utilizing the software was compatibility issues. Had the application not properly integrated with the current systems utilized by the Velir users, they would have been unable to utilize the software and the features designed by the project team.

## Chapter 4

### Analysis

In order to gather the details about the existing process for generating reports from Velir employee time data, we conducted a series of interviews. In these interviews we asked a standard set of questions and a set of specific questions that were tailored to the interviewee. Afterwards we were able to standardize the data and compile our results to form our design.

#### 4.1 Interview Process

In the analysis stage we decided to use interviewing as our primary data gathering technique in order to better understand the problem and start beginning to plan for potential solutions. We started with the managers who were present at our initial MQP introduction meeting and included a few other employees we thought could have valuable insights on the processes related to the employee time data. These included a few developers and end users who did not run reports but could contribute information about their interactions with the time tracking tool, Harvest, from the other end. Once we compiled a list of Velir employees to interview we started the scheduling process. While we initially intended to conduct all interviews in person, unfortunately due to time constraints and travel, we were not able to interview everyone in person and conducted phone interviews.

As a team we compiled a list of questions, found in Appendix E, to understand how Velir employees interact with Harvest. Most of these questions were specific to running reports, which are only applicable to the managers, but included generic questions present that employees in non-managerial positions could answer. These were put together in a single document along with the basic interview guidelines to create an overview for conducting our interviews. The written interview questions were not specifically geared toward each interview or a type of employee since we felt they were simply a guideline of information we would like to collect. During the interview it was imperative that we could obtain as much information from the answers as possible from all of the questions in order to adequately assess the needs of each employee. (Gubrium, 2002)

For interviews conducted on site at Velir there were at least two group members present who both took notes and asked questions when appropriate. We felt a minimum of two members were necessary to take adequate notes. For the phone interviews we met together in a WPI Tech Suite in the Gordon Library and made the call. The Tech Suite provided a large working space and relatively quiet environment. After the completion of each interview, a summary was typed up based on notes that were not already taken in an electronic format. These interview summaries are located within section D of our appendix. (Foddy, 1993)

#### 4.1.1 Interview Table

Below, in table 2, is the listing of interviews that were conducted with Velir employees during the analysis phase and the dates that they took place on.

Interviewee	Position	Date
Subject 1	Position 1	September 7 <sup>th</sup> , 2011
Subject 2	Position 2	September 8 <sup>th</sup> , 2011
Subject 3	Position 3	September 14 <sup>th</sup> , 2011
Subject 4	Position 4	September 14 <sup>th</sup> , 2011
Subject 5	Position 5	September 14 <sup>th</sup> , 2011
Subject 6	Position 6	September 21 <sup>st</sup> , 2011
Subject 7	Position 7	September 28 <sup>th</sup> , 2011
Subject 8	Position 8	October 6 <sup>th</sup> , 2011

Table 2 – Interview Table

#### 4.2 Key Points Breakdown

Once all the interviews were conducted we moved onto the next phase of analysis. We read all the summaries of the interviews and began identifying key issues for each user. We then proceeded to tally up issues shared with other users by ranking the issue, giving a brief description of the issue, identifying the affected users and the reasoning behind it.

##### **Report Excel Template** (Subject 1, Subject 5, Subject 6, Subject 7, Subject 4, Subject 8)

Users currently take raw data from harvest and format it to their needs through Excel. Generating these reports usually involve repetitive tasks that can easily be automated. Having a system that will perform the automations will save the users' valuable time.

##### **Tracking timesheets** (Subject 5, Subject 6, Subject 7, Subject 2)

There are many buckets that are setup for a project. Due to no formal training or standardization, similar tasks are often entered into different buckets. This requires users to manually go through and check each task and make sure that it is in its proper place. Having a system that will enter tasks into their appropriate bucket or providing training for the users will alleviate the need for users to spend time combing through data and editing records.

##### **Notifications** (Subject 1, Subject 6, Subject 7)

Harvest currently has a notification system for broad requirements. Users would like to be able to fine tune notifications so that they can be aware of anomalies immediately instead of having to search for them.

##### **Real Time Reporting** (Subject 1, Subject 5, Subject 7)

The ability to identify and react to projects staffing issues as they are happening.

##### **Connect FogBugz and Harvest together** (Subject 1, Subject 6, Subject 5)

Bug tracking is currently done through FogBugz. Unfortunately, this translates into users having to enter data into both FogBugz and Harvest. Similar to the time tracking issue, discrepancies between users in entering bug data from FogBugz into Harvest time tracking notes section requires lots of manual review.

#### **Invoicing** (Subject 4, Subject 6)

Velir currently uses QuickBooks to handle company invoicing. However, QuickBooks does not support more than 5 users at a time and has no method for restricting access to sensitive company data. Harvest has its own invoicing module that we believe may be a possible solution to support invoicing capabilities for project managers.

#### **Timer feature** (Subject 2, Subject 5)

While Harvest current has a timer feature, it is underutilized due to the daily interactions that occur in an office and users forgetting to pause or stop the timer. As a result, the timer feature, even when used, often displays incorrect time. We discussed the possibility of a global hotkey on windows machines that could start and stop the timer allowing users more flexibility.

#### ***4.2.1 Key Points Breakdown Table***

The key points breakdown table shows the overarching requirements in a quick and easy to read manner. We compiled this table after sitting down and reviewing all the interview summaries.

Rank	Need	Description	Sources	Reasoning
1	Report Excel Template	The ability to have a preformatted report that is more detailed than the date dump from harvest.	Subject 1, Subject 5, Subject 6, Subject 7, Subject 8, Subject 4	Save time generating reports and trimming the same data every week.
2	Timesheet Tracking	Better manipulation and filtering for entered time.	Subject 1, Subject 5, Subject 6, Subject 7	Helps sort employees individually or by project to get a better understanding for what is going on .
3	Notifications	Ability to track anomalies and alert designated people when applicable.	Subject 1, Subject 6, Subject 7	Help stay proactive instead of reactive to staffing issues that arise during a project.
4	Real Time Reporting	The ability to identify and react to projects staffing issues as they are happening.	Subject 1, Subject 5, Subject 7	Ability to track projects without compiling lots of data together.
5	Connect harvest and FogBugz	Integration to create more accurate reporting for time spent on tickets.	Subject 1, Subject 6, Subject 5	Saves time in preparing reports and for tracking bugs during a project.
6	Invoicing	Better integration with QuickBooks or utilization of Harvest Invoicing.	Subject 4, Subject 6	Saves time refining invoices in continually modeling invoices the same way.
7	Time Feature	Global hotkey for entering hours more accurately.	Subject 2, Subject 5	Helps encourage more accurate input of employee hours.

Table 3 – Key Points Breakdown

## Chapter 5

### Design

With the data, the team compiled this information to make decisions for the design of our system. These design considerations were weighed with the specifications of the existing systems, impact on employees, and the scope of our project. We then drew up the technical design for how the system will function and designed the interface using a mockup.

#### 5.1 Design Requirements Gathering

After assessing the needs of Velir through the interviews we conducted, we drew out potential plans for Velir Harvest improvements. We determined potential solutions to problems identified through our interviews that would make as many Velir employees happy as possible while not exceeding our project scope. During this process, we wanted to achieve our goal of streamlining Harvest and reducing the time spent by employees on repetitive, non-productive tasks.

To make the decision we started researching the technical requirements behind each request to assess their feasibility. After significant research and consideration of problem solutions, we met together to make a decision on what areas we wanted to focus our implementation on. Meeting together and going over the Key Points Breakdown Table (Section 4.3) we spent time going over each potential solution and the technical requirements required for that given solution. After weighing both the technical requirements with the benefits to Velir employees, we decided to focus on two specific areas. We cut off the planning and analysis phase at the end of A-term 2011 in time for the initial proposal presentation in order to focus on the presentation of our design and implementation.

The two areas the Velir MQP group decided to focus on are the ability to better control the data output from Harvest and automating the process of generating reports. For the improved data output, a web interface will serve to provide an interface for maintaining more granular control over data within Harvest. To automate the generation of reports, the interface will have the ability to directly export Excel reports that are regularly generated with the click of a button. We will discuss these two components in more detail in the sections below.

#### 5.2 Design Implementation

The Velir MQP felt it would be most beneficial to first improve the interface for exporting Harvest data to Excel for reporting. The plan is to have an intermediary page that would pull data from Harvest in a more efficient manner than Harvest can provide. It would allow for more specific queries to be made, which saves time in removing unnecessary data, and combining data. This page would be written in Ruby and will utilize the Harvest REST (Representational State Transfer) API. This feature was one of the most widely requested features from Velir managers.

The second feature we would like to focus on is the automation of formatting of these reports. Since all the employees who extract raw data from Harvest bring them into Excel initially, we felt it would be important to not only make it easier to get the data in Excel but also alleviate the repetitive formatting tasks that need to be completed. However since each report involves specific customizations and tweaks

to the raw data, we are unsure how many reports we will be automate. However the design of our project will include opportunities for future projects to help utilize our Harvest data export framework to create more specialized reports.

We believe that our proposed solutions will greatly help improve productivity for Velir employees who interact with Harvest. Looking at our schedule and assessing our team's technical abilities, we feel that using Ruby and the Harvest REST API will deliver the best solution and remain within our projects scope. We have already begun our testing of the Harvest API through the development Velir Harvest site and will continue testing and development throughout B term.

### 5.3 Design Mockup

For the greatest availability and cross platform utilization, we decided to make our application web based. This means that all of our code would be running on the webserver the page is served using and not on the user's machines. The application is coded in Ruby on Rails and utilizes the Harvest REST API to obtain data and authentication means from Harvest.

Our design mockup below (Fig. 8) reflects the main page that would be presented to users after successfully logging into our system. This page would be the only interface to our system, aside from the login page. The design of the page is stylized after the Harvest interface which features warm and modest colors and simplistic styling. Our goal is to have little differentiation between our system and Harvest so that users are not confused by strikingly different designs, further disrupting user workflows (Schneiderman, Plaisant, p288).

In the header of the page, the Velir logo is present in the upper left corner along with a small title bar that greets the user on the left side. Within the title bar, on the right side, is a Log Off link so that users can securely exit our system. In the main body of the page, in the top left corner, is a drop down menu with projects populated from the Velir Harvest system. The projects that appear in this drop down will depend on what the employee has access to. Below that drop down menu is another drop down menu that contains timeframe data. This timeframe data is static and consistent with the existing Harvest options (This Week, Last Week, This Semimonthly Period, Last Semimonthly Period, This Month, Last Month, This Quarter, Last Quarter, This Year, and Last Year).

If the user does not select anything in the project drop down menu, they will not see any checkboxes below these two drop down menus (Schneiderman, Plaisant, p271). However, once the user selects a project from the drop down menu, relevant checkboxes with the fields found in the selected report appear. This allows for the user to select and deselect columns of data that they do not want to appear in the report they generate. This customization is not currently present in the Harvest report exporting feature. In the footer of the web page is an Export button that will gather the report for the selected time frame and with the selected fields in CSV format for further review or editing by the user.

During the export process, the system applies customizations using Excel XML formatting to style the report as the user desires. These preformatted customizations would be hard coded by the system developers and assigned to a specific report. This would allow for users to routinely export data from the system and have the CSV formatted in a similar way every time (Schneiderman, Plaisant, p462). This

is a contrast to the current process where the users spend a great deal of time formatting reports in Microsoft Excel after downloading the unformatted CSV from Harvest. Unfortunately due to limitations in creating a template for repeatedly exporting data, there is no good way of allowing end users to customize their reports in the front end.

The design adheres to HCI (Human Computer Interaction) design principles for web applications. The uncluttered interface makes it easy to focus on the task of exporting data and has no distractions for the user to get lost or become confused (Schneiderman, Plaisant, p492). It follows the three U's (useful, usable, and used) by offering a better way to download reports that are regularly exported from Harvest, being able to do this task extremely efficiently, and being designed for the users to continually use the tool in their workflow. The colors and design layout is very similar to Harvest, which is both aesthetically pleasing and highly functional (Schneiderman, Plaisant, p 466) Harvest is also, across the board, being used across the board by our target users.



Welcome, Bob [Logoff](#)

Project Selection

- Project
- Date
- Client
- Project
- Project Code
- Task
- First name
- Last name
- Note

Export

Fig 8. – Web interface mockup for proposed system, November 2011



## 5.4 Report Mockup

For those Velir users who regularly generate reports in Excel from Harvest data, we have added the functionality to our system to create report templates. This means that the formatting for a report can be defined once and get regularly generated with new report data. This frees up countless hours per week, month, and year for Velir employees who currently have to format updated Harvest data in Excel every time they download a new report from Harvest.

Formatting and other template specific information is defined in the Excel XML, which is stored on the server. Every time the export of that report is called, the formatting information is applied to the data query which allows for the users to be instantly delivered the report they want. Since the reports each user generates are already created, to create the template we have to look at the formatting of each report and translate that into an XML template.

In the mockup report below (Fig. 9), three data fields (Last Name, Monthly Hours and Note) are pulled from Harvest and an additional calculated field is created based on the number of days in a month. Additionally, based on a certain threshold, a conditional formatted colored icon is displayed to the left of the calculated field cell. There are also borders created around certain fields and text bolded in the title row. These parameters would be customized for each report and could be further enhanced as the employees felt necessary. Unfortunately due to technical limitations and our MQP project scope, we are not able to provide an additional interface for creating templates. This means that the templates need to be created or modified manually using the Excel XML.

Last Name	Total October Hours		Hours/day
Norton	857	●	37.26
Caplette	775	●	33.70
Mathew	774	●	33.65
Brady	757	●	32.91
Dolan	752	●	32.70
Navarra	745	●	32.39
McArdle	675	●	29.35
O'Connell	655	●	28.48
Fraser	646	●	28.09
Garrant	645	●	28.04
Harrington	564	●	24.52
Rubin	454	●	19.74
Gupta	454	●	19.74
Goetz	445	●	19.35
DuRand	424	●	18.43
Delay	424	●	18.43
Mazzoni	222	●	9.65
Leggett	164	●	7.13
Distaula	111	●	4.83
Murphy	111	●	4.83

Fig 9. – Example report output from proposed system, November 2011

## **5.5 Proposal Presentation**

At 11:00AM on November 16<sup>th</sup>, 2011 the Velir MQP team and advisor went on site to Velir Studios in Cambridge, MA to present the findings and proposed solution to Velir. The presentation was held in a Velir conference room and the Velir MQP team gave a PowerPoint presentation to Velir employees involved with the time tracking MQP project. The PowerPoint slides presented at this proposal presentation meeting are found in Appendix H. The findings through the planning and analysis phase were presented along with the proposal for the design and implementation section. The feedback given from Velir and the subsequent changes made by the Velir MQP team are noted in section 5.5.1 below.

### ***5.5.1 Noted changes from Proposal Presentation***

The Velir MQP group would like to acknowledge the changes set forth at the Proposal Presentation meeting on Wednesday November 16<sup>th</sup> 2011, at Velir Cambridge offices. To summarize, the consensus was that employees within Velir were going to discuss the refinements and suggestions for the group. The employees proposed removing the checkboxes for the different data fields since they would likely not get used. The employees also discussed eliminating the web interface and focus on exporting the data into Excel. The Velir employees mentioned there would be a follow up after an internal meeting at a later date, so the Velir MQP group was going to follow up to get further details.

## **5.6 Update to Velir**

The following updates were provided to the Velir MQP management team to keep them updated with the developments of the WPI Velir MQP team. These updates were provided both via email and in person at Velir Studios.

Upon receiving feedback from the team at Velir as to how our project team should begin carrying out the remainder of the project, we began conducting research that would support the work we were conducting. After several weeks of research and initial project development the team presented Velir with an update to inform them of the research being conducted and the specific direction the project was being taken. The update included summaries of the work progress that individual members had made as well as work schedules for the remainder of the project. Also included in the update were examples of reports that would be generated based on the initial development thus far in the project cycle. The reports themselves were generally straight-forward but would provide the Velir team with an idea of how the other reports would be formatted. The last inclusion in the Velir update was a brief Camtasia video seminar demonstrating how we plan to utilize the video recording software as a tutorial for Velir to use should they need an interactive video guide to better understand the tool we are providing.

### ***5.6.1 Updates throughout final design***

Throughout the last term of the project, the development part of the Velir MQP team had weekly (or more frequently) meetings with Velir employees. Some meetings were held on site at Velir and others took place remotely over Skype video conferences. During these meetings, which were typically held with Subject 7, Subject 8, and Subject 3 the discussion focused on progress being made with the system development and suggestions for adjustment and further design considerations. This

provided an opportunity for the development team to continually provide updates and for Velir to have continued input onto both the status of the system as well as design considerations.

### 5.7 Completed templates

From the revised design requirements, in order to focus more on the Excel side of reports, the MQP team created fourteen Excel PowerPivot templates to help facilitate an improved workflow for reporting on data coming from Harvest. These templates are broken down into two distinct types: reports and dashboards.

#### 5.7.1 PowerPivot report templates

A PowerPivot report template is an interactive method for manipulating Harvest time data within Excel. There are four PowerPivot report templates which each have a unique purpose in the Velir management workflow. As seen below in figure 10, a report can contain be dynamically manipulated by the date slicer on the right to reflect specific information. All data within the report can be updated with new Harvest (or other data) by refreshing the data source, which is detailed throughout the system manual. Compared to the existing styles for generating reports, these templates represent a large savings in time completing repetitive formatting or sorting tasks within Excel. This also comes with the added benefit of a more user friendly workflow, as data updates can easily be facilitated from Harvest.

The image shows a screenshot of an Excel PowerPivot report. On the left, there is a table with 'Row Labels' and 'Sum of hours'. The 'Row Labels' column lists 26 names, and the 'Sum of hours' column shows a value of 40 for each name. To the right of the table is a 'Date' slicer with a dropdown arrow. The slicer contains a list of dates from 8/15/2011 to 8/21/2011, with each date in a separate button.

Row Labels	Sum of hours
Talty	40
Grizzard	40
Valliere	40
Navarra	40
Doller	40
McArdle	40
Dolan	40
DuRand	40
Blackmore	40
Truong	40
Mazzoni	40
Goetz	40
Leggett	40
Brady	40
Douglass	40
Murphy	40
Rosowski	40
Lee	40
Seide	40
Sulham	40
Distaula	40
Cross	40
Warren	40
Kemble	40
Mauriello	40
Ribaudo	40

Date

- 8/15/2011
- 8/16/2011
- 8/17/2011
- 8/18/2011
- 8/19/2011
- 8/20/2011
- 8/21/2011

Fig. 10 – An example of a PowerPivot report template

### 5.7.2 PowerPivot dashboard templates

A PowerPivot dashboard template is a highly visual way of viewing Harvest time data within Excel. There are ten PowerPivot dashboard templates that are grouped by relevant Harvest date (for example, departments, clients, ectera). As show below in figure 11, a dashboard typically contains a handful of graphs of various types that illustrate the data within the given data date range. Each graph has a specific report with the information in text form in separate sheets (titled by graph name). As detailed in the documentation, and like the report templates, these dashboards can be updated with new Harvest data with just a few clicks. Unlike the large text only reports previously generated by both Harvest and Velir, these dashboard provide a quick way to obtain a strong understanding of data and easily pick out anomalies.

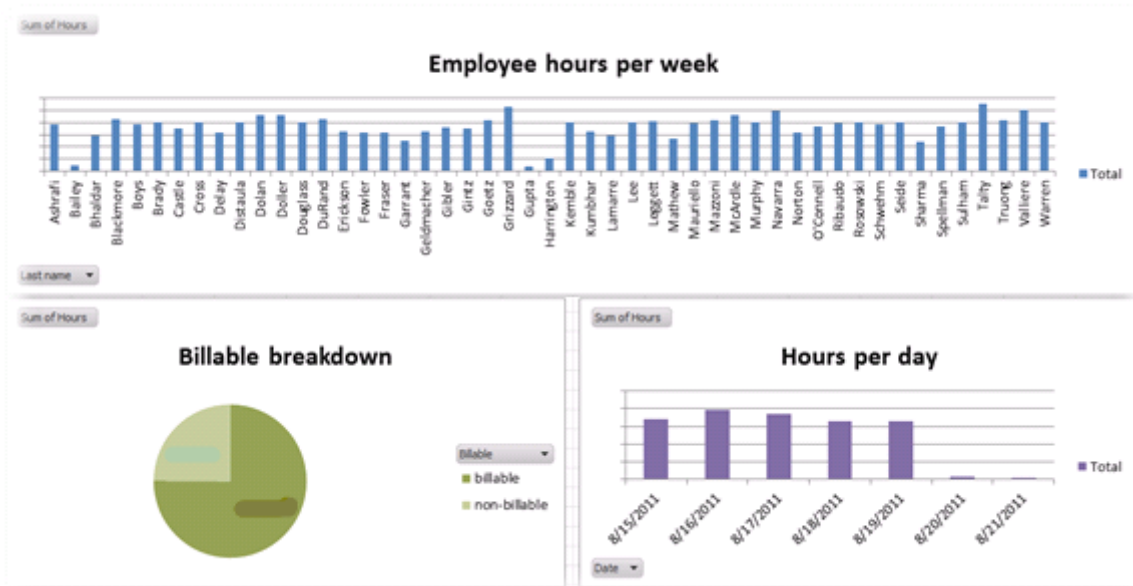


Fig. 11 – An example of a PowerPivot dashboard template

All of these PowerPivot templates are included in electronic form on the CD included with this report and are ready for immediate use. For more detail on the usage of the report templates, please refer to the Training Manual in Appendix K.

## Chapter 6

### Implementation

One of the most important aspects of the implementation phase of the SDLC was developing documentation of the system in development. During this process, we considered both the system design and the existing systems to implement effective training methods for the Velir employees. In the following sections we will elaborate on two specific types of documentation; *User* and *System*.

In order to accurately train employees a tutorial and user guide were necessary. Before being able to create an interactive tutorial as a method of training we needed to understand the software. We received training on Camtasia from Jim Monaco from the WPI Academic Technology Center. Camtasia Studio is a computer software program that allows the capture to video record the screen. Camtasia is easily customizable and fit our needs as a method of creating the tutorial.

During the training session with Jim we focused on tools of the Camtasia software. Jim explained many of the basics such as screen size; how to record, pause, and stop the recording and basic editing tips. He also taught us more advance tools like transitions between clips, screen call-outs, zoom and pan techniques, and quizzing options. We plan to utilize the techniques and tools that Jim has taught us in our final tutorial documentation.

#### 6.1 User Documentation

User documentation is designed to educate potential users on how to properly operate a system. Specific documentation could simply be a manual that elaborates on all the aspects of the system in detail or possibly an online video or interactive tutorial. Regardless of the method of delivering information, the objective is to effectively inform those who will be operating the system of all the features available to them. In Velir's case, we developed an instruction manual that provided an overview of the different reports the system would be able to create as well as methods for creating them. Velir employees would be able to learn about the unique reporting features available to them as well as the particular process for developing them based on their specific needs. The text within the documentation has been supplemented with screenshots of the interface and visual examples of the different reports available to further increase the readers understanding of the tool we develop. The manual is provided in an electronic format to minimize the expense of paper documentation and allow readers to quickly access information through the usage of key words. However, both the manual and screenshots of the different reports are included in the appendix of this report.

The text based portion of the documentation is accompanied by a short instructional video using Camtasia, a screen recording software. The video provides a basic walk-through of the application and demonstrates how to access and create each of the reports available to the user. The instructional video focuses primarily on navigating through the interface and teaching efficient methods for generating reports.

## 6.2 System Documentation

System documentation, in contrast with user documentation, is intended to help programmers and systems analysts better understand the application software for a particular information system. (Dennis, Wixom, & Tegarden, 2005) Just as users need to understand how to properly utilize software, programmers need to understand how to adequately design and maintain it. This is necessary in cases where software needs to be expanded upon to incorporate additional features or condensed if certain features become outdated or redundant. A CD including all relevant digital files will be included with the report documents for employees that wish to view or potentially modify the types of reports generated in excel.

In choosing the proper format for the system documentation, we decided to use a pre-structured template provided by Microsoft that could be modified based on the design and functionality of a software or application. The template chosen provides a general outline of the necessary sections required in a software user-guide, including a cover page, introduction and overview sections.

In addition to the pre-defined sections within the user-guide template, two step-by-step tutorials were included for producing two unique reports from the templates we developed. The tutorials start from the Harvest interface through the use of screen-shots and arrows, guide the reader through the process of inserting Harvest data into a pre-defined template. The reader is instructed how to update the report templates and refresh any charts or graphics to reflect the new data sets imported from Harvest.

## 6.3 Conversion Plan

The conversion plan is a process of transitioning from an old system to a new system. We created a conversion plan so that when we converted our new system it could easily be facilitated by Velir. The main factors to creating a conversion plan are how quickly the system is changed over, the location of the conversion, and how the system is introduced. Figure 12 below shows the different possibilities of a conversion plan.

Conversion Style is how quickly the only system will be changed over to the new system. With a limited time for the project we felt that a direct conversion style would be best. The direct conversion would allow us to quickly and easily set up Velir with a new system. Because Velir is only in one location we plan on using the simultaneous conversion which simultaneously changes the system through all locations. Our conversion will be the a modular system.

According to the table the risks associated with this conversion plan can tend to be high but because of the type and size of the system we feel it is the best approach. Direct Conversion will be the fastest and easiest way for our system to be imputed. By simultaneously converting our system it will allow all employees using it to be on the same knowledge base and by converting using a modular system we can easily and quickly see if there are any problems with the system and fix them.

Characteristic	Conversion Style		Conversion Location			Conversion Modules	
	Direct Conversion	Parallel Conversion	Pilot Conversion	Phased Conversion	Simultaneous Conversion	Whole-System Conversion	Modular Conversion
Risk	High	Low	Low	Medium	High	High	Medium
Cost	Low	High	Medium	Medium	High	Medium	High
Time	Short	Long	Medium	Long	Short	Short	Long

Fig 12. –Conversion Plan(Dennis, et al., 2010)

## 6.4 Training Plan

It is important to properly train the Velir employees on how to use this new system. In order for this to happen we needed to create a training plan. A Training Plan helps users focus on being able to accomplish the job at hand. Training needs to focus on the activities around the system and the system its self. (Dennis, Wixom, & Tegarden, 2005)For training the Employee we kept the steps very simple and clear so that the user understood what they needed to do not what the system could do.

We chose from three different types of Training Plans: One-to-one training, Classroom training, and Computer-based training. Based on the figure 13 below, Computer-based training was chosen to be the best method. This method would allow for us to reach the maximum amount of people in the shortest time span as well as have a low cost of delivery and development because we are developing the training ourselves. For those who would not like to use the Computer as a training method we also have a written manual located in Appendix J.

	One-on-One Training	Classroom Training	Computer-Based Training
Cost to develop	Low-medium	Medium	High
Cost to deliver	High	Medium	Low
Impact	High	Medium-high	Low-medium
Reach	Low	Medium	High

Fig 13. –Training Methods(Dennis, et al., 2010)

As shown in the figure above Computer-based training does have a high cost to develop but because we are developing it ourselves with software we have free access to, it is relatively inexpensive for us to develop and deliver ourselves. We are planning on reaching and impacting a small number of people in a short amount of time so based on these many reasons computer-based training was chosen.



## Chapter 7

### Conclusion

In the end, the Velir MQP project was an extremely valuable experience for everyone in our group. The project provided the opportunity to analyze an existing process and implement a system within a real company. In the beginning our group worked together to gather information about the existing system through interviews and internal data gathering. However after the proposal, in the design phase, the group was divided to separate through the design and implementation phases. Since the group was divided between those with experience in coding and working with external API's and those who were not able to extensively code anything, the mix created an interesting dynamic that was challenging at to work with at times. However with time, we were able to work out a balance between the two different subgroups to proceed forward with our system development, with everyone sharing a balanced load of work.

Developing the revised software solution proved to be difficult task for the development part of the MQP team, after the design constraints were finalized by Velir. The hopes for assisting in automating mundane and repetitive tasks were made difficult by incomplete (or non-existent) API's with the revised project scope. However, we proceeded and were able to complete some workarounds to the missing API's. The development team also placed a heavy emphasis on the reports as developing software to automatically generate them became tedious. We were able to create seventeen concepts for Excel report templates that satisfied the requirements Velir had.

During the implementation phase, the development team and the documentation team worked together to create the plan for Velir to integrate the new developments into their existing workflow. This included working side-by-side to produce documentation that accurately reflected the full capabilities of the reports and software that was created.

Compared to the workflow that existed prior to this development, there will be a large increase in the understanding of Harvest data and time saved by managers who compile the reports. Since Power Pivot based reports are not static and can constantly be tweaked, Velir employees will be able to use and tweak these templates as they please for years to come. While we understand that during implementation this may initially come with some increased cost in time, it should be clear to all Velir managers the power that Power Pivot has over static Excel reports. With the migration to Power Pivot, all Velir managers should have more control over the answers and information they draw from the Harvest data.

The project provided a great opportunity to utilize the Systems Development Life Cycle techniques learned in the Systems Analysis and Design course. Instead of completely faux reports, everything contained within this project was real. This included creating a strategy in the beginning of the project, interviewing with Velir employees, conducting internal research, brainstorming potential design solutions, receiving feedback on design ideas, implementing the solution, and finally documenting the process in a detailed and methodical process. Unsurprisingly when compared to class work, these tasks are increasingly difficult as demonstrated in the issues detailed throughout the design section (Chapter

5). In the end, the project was a rewarding experience that will remain invaluable to the Velir MQP team members.

### **7.1 Recommendation**

The Velir MQP team recommends that Velir, upon delivery of the system, begins to review the implementation procedures for integrating the system into the workflow of all employees. This way the changes will not be neglected and forgotten about, and any questions can be asked of the Velir MQP whilst they are still students at WPI. There are many resources available within the implementation section which can aid the conversion from static to dynamic Excel reports.

For future implementations and revisions to the project, it would be important to explore ways of fully automating the export of data from Harvest into a Power Pivot report in Excel. While the Excel side of the system can use a backend database server to pull information from, the data still needs to come from Harvest. Harvest, at this time, is unfortunately not particularly as friendly to the output of data as would be helpful. Therefore, Harvest may remain a potential bottleneck in creating a fully integrated solution in the future. While Harvest is a robust and simple tool for time tracking, it could benefit from better data input and output, particularly in the API published by Harvest.

## References

(n.d.). Retrieved 11 4, 2011, from SitePoint: <http://www.sitepoint.com/computer-interaction-site/>

(n.d.). Retrieved 11 1, 2011, from <http://www.comp.lancs.ac.uk/~dixa/papers/web-hci-2011/>

Bill and Melinda Gates Foundation. (2011). Retrieved October 26, 2011, from Impatient Optimists: <http://www.impatientoptimists.org/>

Fog Creek Software. (2011). *Features*. Retrieved September 20, 2011, from FogCreek: <http://www.fogcreek.com/fogbugz/features/>

Harvest. (2011). *Tme Tracking made Easy*. Retrieved September 16, 2011, from GetHarvest: <http://www.getharvest.com/features/time-tracking>

*How to Automate Excel*. (n.d.). Retrieved 10 26, 2011, from <http://support.microsoft.com/kb/308292>

*Introduction - Harvest API*. (n.d.). Retrieved 10 25, 2011, from [http://www.getharvest.com/api#\\_](http://www.getharvest.com/api#_)

Kenexa. (2011). *Massachusetts Salaries*. Retrieved November 4, 2011, from Salary: [www.salary.com/mysalary.asp](http://www.salary.com/mysalary.asp)

*Systems Analysis and Design, 4e*. Dennis, Wixom, and Roth. 2010.

*Designing the User Interface: Strategies for Effective Human-Computer Interaction, 5e*. Schneiderman and Plaisant. 2009.

## Glossary

Application Programming Interface (API) – A set of routines, protocols, and tools used for building software applications

Body – An area, generally in the center of a web page which contains the main content of the page

Back-end- The aspect of the system or program not seen by the user

Comma Separated Values (CSV) – A file that stores number and text data in plain text form

Camtasia-Camtasia Studio is a screen video capture software, published by TechSmith

FogBugz – Third party software used to track bugs in application development

Footer – An area in the lower portion of a web page, which is generally below the main content

Harvest – is a web based time tracking and reporting software

Header – An area in the upper portion of the web page, which is above the main content

Human Computer Interaction (HCI) – A formal set of rules and guidelines created with the purpose of improving user experience

Interface- Aspects of the system or program that can be seen by the user

Major Qualification Project (MQP) – A project in a student's major field of study that demonstrated the application of skills, methods, and knowledge

Representational State Transfer (REST) - An architectural style for designing networked applications

Software Development Lifecycle (SDLC) - a structure imposed on the development of a software product

User – Anyone who uses the application

Extensible Markup Language (XML) - a customizable set of encoding rules for a document

Visual Studio Tools for Office (VSTO) – An API framework which allows interaction with Microsoft Office products from Microsoft Visual Studio

## Appendices

### Appendix A: System Request

**Project Name:** Develop a reporting system for Velir

**Project Sponsor:**

Name: Dave Valliere

Position: Chief Operating Officer

Organization: Velir

E-mail: [dave.valliere@velir.com](mailto:dave.valliere@velir.com)

**Business Need:**

Velir is in need of an Application Programming Interface (API) or more depth analysis of Harvest to create reports in a more standardized and efficient way. This tool would help automate repetitive tasks and save time formatting reports every week.

**Functionality:**

The reporting system for Velir will provide managers with a more standardized and easier to use display of reports such as:

- “Invoice Report” template
- Roll up hours by project and department each month
- Determine billable/non-billable hours for each employee
- Track employees who are trending below or above 40 hours per week
- Determine “burn-rate” for projects

Determine accuracy of project estimates

**Expected Value:**

- An easier method of creating reports
- More standardization to reduce human error

**Special Issues or Constraints:**

- We have a 21 week timeline to develop and implement this system

## Appendix B: Feasibility Analysis

### Technical Feasibility: Can We Build It?

- Familiarity with Application:  
The Team project team would need to develop a familiarity with the Harvest software from which the data in our reporting tool will be pulled. Interviewing the primary users of Harvest will also be necessary to determine the specific reporting features we would need to emphasize during the design phase of the project. Most important: Building knowledge and awareness of the core functions of Harvest. Data from harvest-> excel, learned what reports looked like
- Familiarity with Technology  
Utilizing Ruby on Rails, an open-source web framework coding language and the Harvest REST (Representational State Transfer) API. Additionally, an excel add-in written in C# (C-Sharp). Excel Power Pivot templates will be included in the design phase of the application.
- Project Size  
Four students on the project team; each of which will participate and contribute equally during the Planning and Analysis phases. At the onset of the Design phase, the team will split into two sub-groups. Group 1: Designing the specific reporting queries with requires coding languages. Group 2: Produce extensive software documentation and video tutorial of the reporting tool and integrating into business

### Economic Feasibility: Should We Build It?

- Development Costs  
Velir invested a sum of \$10,000 into this project
- Annual Operating Costs  
No additional recurring operating costs, unless they choose to expand the application
- Annual Benefits (Cost Savings and Revenues)  
Cost savings of approximately \$1692.07 per week. Annual savings of \$87,987.64. Employee salaries
- Intangible Costs and Benefits  
Integration of new software into current work-flow (time to adjust to new system)  
Benefit: more control over reporting, much less time involved, more information

### Organizational Feasibility: If We Build It, Will They Come?

- *Project Champion(s)*  
Tiven Weinstock: Director of Sales and Marketing  
Corey Caplette: Director of Development
- *Senior Management*  
Mark Gregor: President and Chief Executive Officer (CEO)  
Dave Valliere: Chief Operating Officer (COO)
- *Users:*  
Mary Kate McArdle: Director of QA  
Aaron Cross: Software Developer  
Tiven Weinstock: Director of Sales and Marketing

Mark Gregor: President and CEO

Adam Ribaldo: Director of Analysis and UI

Dave Valliere: COO

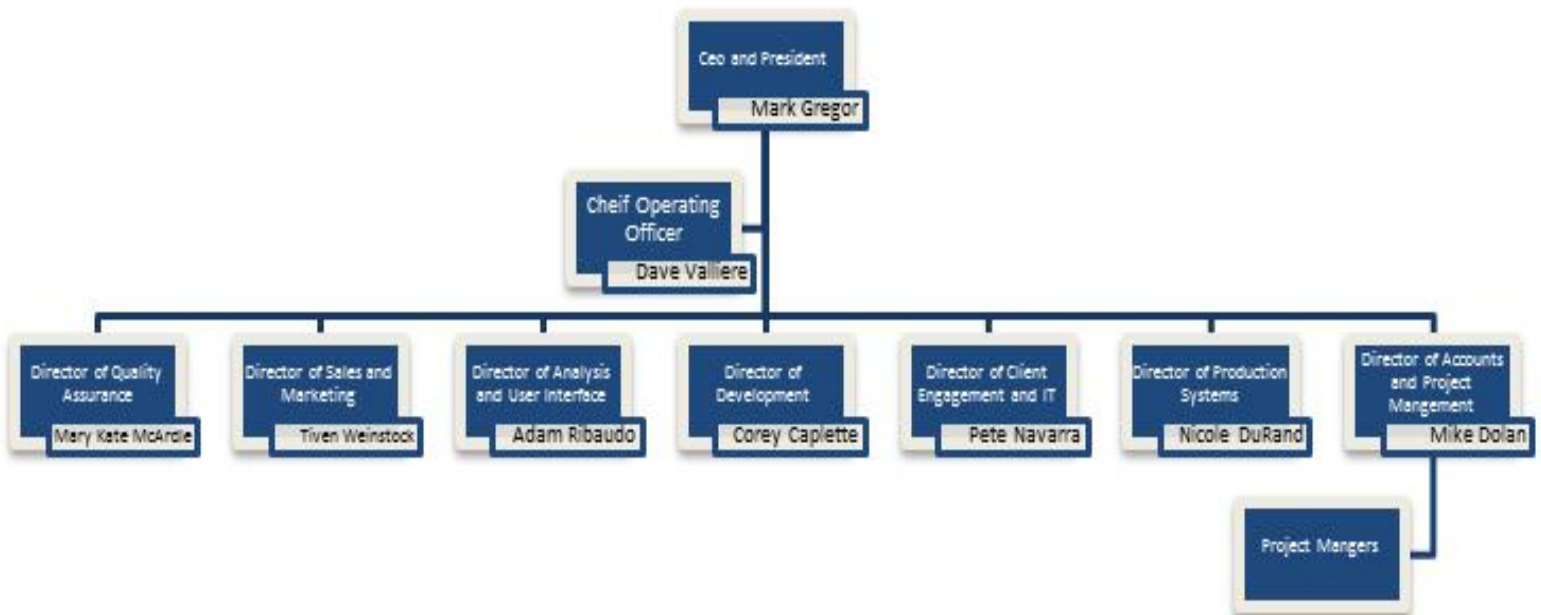
Corey Caplette: Director of Development

Mike Dolan: Director of Accounts





## Appendix D: Organizational Chart



## Appendix E: Interviews

### Subject 1

- Uses Harvest everyday
- People feel it is burden but she understands the use and was accustomed to time tracking from her previous corporate background
- She believes that everyone should be entering times in 15 minute intervals
  - That way tasks do not get grouped together into larger chunks
- She runs weekly reports off Harvest data for the two groups she runs
  - Quality Assurance
  - Production support
- Wants to see where time is being spent
  - For example, what is the total time for a given ticket?
- Takes two hours to generate the final report from Harvest dumps
  - Usually runs the report on a Monday
- Has to have her team members manually put in the ticket numbers
- Cannot put in anything but the number otherwise the entry has to be trimmed or discarded entirely
- Tickets may touch both Production Support and Quality Assurance
- Uses FogBugz for ticket and bug tracking
- Can look at teammates (and entire companies) timesheets [possible security concern]
  - Enjoys the ability to edit other peoples timesheets if necessary
- Project setup could be different
  - Restrict time assignments to certain people
  - Uniform account categories
    - Not consistent through different accounts
    - For example, billable changes in “Goodwill Design Refresh”
  - Open fields can cause ciaos
  - Standardize setup across different projects
- She is looking for a detailed time report every week
  - Does not use Harvest for expensing
  - Does not care about being on or off budget
- Process involves immediately exporting to Excel, little work that is done in Harvest for reporting
- Generates PowerPoint overview of weekly data from Excel sheet every week to management
- Report generation workflow
  - Sort By Client, then Project and then task
  - Separate project groups
  - Sum data and prepare PowerPoint report
- Looking for hour totals for all staff, per project
- Get a number of tickets handled
- Often inaccurate as the data is only as good as what is entered by other employees
- She manually tracks incoming tickets independent of Harvest and FogBugz to keep a better count
- Harvest does not have a good capacity planning function
  - Problems and surprises crop up after the fact
- Example, after projects completion: Are we over budget? Why are we over budget?
  - With better tracking and insight these problems could be solved in advance
- Notifications or alarms to alert managers to upcoming capacity problems

- Capacity balancing is easier with more notice
  - MA versus India
- Need better real time reporting and analysis so projects can be handled better
- Would like to have a dashboard to track resources
- Alerts for users who are under or exceed 37.5 hours per week
  - Flexibility to extend this on a per person level would be ideal
- Last five bullet points on the Reports handout were hers
- Sent us examples of her Excel and PowerPoint slides

## Subject 2

- Worked with Velir for about 2 years
  - Maybe about a year maybe a little less
  - Managers might remember it bit more clearly
  - Everyone's happier with it
  - iPhone app, web based tracking, notion of a timer. Press start and stop.
- How many people use the timer feature? System analysts might be more prone to use it.
- What major barriers
  - Not a lot of clarity around what's being built around what
  - How much of this should be entered?
  - Is this a support task?
  - Is this going under a particular development topic?
  - Don't know where
  - Lack of information available
  - Some of the time it's unclear where it's going to be built to
- Interrupted all the time
  - Emails with varying response times
  - Someone comes over and asks a question
  - Maybe just the idea of a timer isn't good enough
  - Start and stopping. You end up having to do a lot of it.
  - Within twenty minutes
  - All I ever see is personal time entry sheet
  - If there was some kind of self-reporting view mechanism available, Subject 2 would use it to kind of self-motivate himself.
  - Would love to look at stuff
  - General anonymous hours
  - Boston foundation
  - See how many hours you have put you've put
  - See how long the estimate would take
  - It would be cool to be able to track that
  - The cost of exposing that information developers might be higher
  - Anonymous even,
  - Personal curiosity ball parking estimates
- Giving estimates is something is something that is done very often
  - Most of the estimate comes from the developer and trickles up to manager types, internal calculations
  - What the technical complexity of meeting it will be and give some kind of hour on that.
  - Typically, a senior person looks at the big picture will give some general estimates for a bunch of tasks. Then. A larger group of developers will take on those tasks even

- When Subject 2 enters hours into harvest, he doesn't enter them granularly.
- Not even entering hours to check the more detailed estimates.
- Maybe a task by task basis
- Sometimes it's really difficult to divide work
- Certainly be useful information to have
- Hard to summarize a bunch of free text.
- Very much based on the client and type of work.
- They might come along and say we want these two new features.
- We think this one is better.
- If it's a whole big chunk of work then you can't really get down to the very end
- Lot of unknown details
- Changes in projects happen all the time. Well, here's the next chunk of stuff.
- A lot of additional changes, but less

### Subject 3

- Only inputs hours and reviews expenses
  - Lots of non-billable work with sales and marketing
- Has tried to run reports in Harvest
- Does not manually create any documents or reports from Harvest data
- Used the Harvest time tracker application
  - Really helpful to stay on task
- Needs to be able to see the budget status of a client through their projects
  - Needs to compile across clients
  - Would like to see a distribution and average
- Wants to see how many people are using non-billable time
- Do not submit time sheet, rather just save them
  - No one is approving the timesheets
- Expanded tasks for business development
- Has no problem with Harvest presently

### Subject 4

- Running reports for invoicing
  - QuickBooks generates the invoices
  - Excel template for more detailed invoices
- Accountant takes the QuickBooks accounting data
- Manual invoice process
- Harvest cannot replace QuickBooks
  - Very daunting thought
- Takes Excel dump from Harvest for individual employees
- Manual process of reviewing hours
  - Fixed bid project versus hourly (obviously is different)
- No other reports are made
- People forget to use Harvest to submit their times
  - Want a report of people who do not regularly submit their times
- Training for accuracy
  - -Bigger problem at hand
- Not day to day in Harvest so does not know everything

- FogBugz interface with Harvest
- Follow the common thread identified in the interviews
- Brookings.edu
- ImpatientOptimists.org
- Sitecore .NET CMS
  - Lots of work in this field but not enough resources to fill
- Adobe Day CQ5
  - New CMS platform
- Open source Ruby on Rails people
  - Looking to grow initial department
- Visualizations
  - Dartmouth Atlas of Healthcare
- 42 employee developers
  - Small interactive development
  - Want to do more graphic design
  - Moving down to the first floor with the next six months to expand
- Started in 2000
  - Amy Casey foundation
  - Repeat clients in the vertical market
  - 3-5 years growth was slow, initially
  - Largest growth rate was in the past 3-5 years
- Started at the peak of the dotcom boom
  - Kept going strong with one client and three developers
  - Helped to expand through networking, over time

## Subject 5

- Email address for client (per client)
  - Shows up in FogBugz
  - Hosted service offsite
- Extensible and easily refinable
- Some clients prefer email and others want to manually input the data
- Prefer email address to other forms (manually submitting a ticket)
  - More tech savvy clients prefer the ticket
- Used for internal support requests as well
- Pete knows the most about FogBugz
- Feature request tracking
- Good reporting
- Can see all the communication history
  - Good and bad thing
- Clients do not want to see the entire communication history
- Reports to come from Harvest
- Workflow is to add a new case/old case
- Case ID should go to Harvest
- Currently FogBugz does not get the case information
  - Have to copy and paste to find the breakdown
- Both Harvest and FogBugz have API's
- Create master report and have a link between Harvest and FogBugz
- Talk to someone else first

- Get FogBugz and Harvest talking together
- Hourly reports per month necessary for billing
- Relatively limited information needed for work
- Bank of America, ADP, QuickBooks, Harvest
- Subject 6 and Subject 4 are the only ones with QuickBooks access
  - Can Harvest replicate all the functionality (??)
- FogBugz -> Harvest
  - Generic offering to the community
- Setup Velir test FogBugz integration
- Talk to Subject 9

## Subject 6

- Daily running reports on projects
  - Trending budget statuses
  - Weekly reporting basis
  - Invoicing clients
    - Support clients
  - Look at staff billing totals
    - -Not appropriately billing
    - -Users working more than 40 hours a week
  - Staff tab in FogBugz
    - See where they are on billing
- Invoicing numbers come to Excel from Harvest directly
  - Manually formatted
  - Would like a ready-to-use template
- Look at ticket numbers and cross reference to FogBugz
- Notifications would be excellent
  - Budgets need to be enforced
  - On trend, over time, for the users
- Budgets are closer to track real time
  - Due to what already exists in Harvest
- Staffing is more reactive than would be ideal
  - Dealing with problems as they happen
  - Nature of (some of) the problems
- Tie together historical data from Harvest would be great
  - Generate a report with it present
- Used to use QuickBooks for hour reporting
- Harvest was a great improvement from QuickBooks in this regard
  - One step in the right direction
- Getting rid of manual formatting
- Gap analysis for Harvest
- Invoicing feature in Harvest
  - Integration with Harvest would be excellent
  - Tie them together
- Try to automate
- What is available
- What is offered in Harvest already

## Subject 7

- Puts his hours into Harvest
- As a manger
  - Wants to understand which individuals are irregular in hours
  - Wants to see too many hours/not enough hours
- To complete the reports, dumps data from Harvest and brings it into Excel
  - Hours over a week
  - Hours over a project
  - Total hours spent on a project
    - Estimated versus actual
- Get tracking down to the task level
  - Using the notes field in Harvest
- See how effective we are estimating
  - Try to make better estimates in the future
  - Want to get paid for work correctly
- Help deal with work staffing issues
- Used Power Pivot and Tableau
- Does not use the Harvest reports
- Reminders for putting in hours would be excellent
  - Who did not enter hours for the week
- Harvest reports do not display people who have not entered their hours
- About an hour per week in Harvest
- Can send some examples
- Standardize reports and groups
  - Take advantage of features Velir are not aware of
- Does not do any work with FogBugz
- List of all active projects
  - What is going on
- Trending project dashboard over time
- Does not necessarily need real time data
- Every week is fine
- The hours reported get less detailed over time
- Forecasting features would be interesting
- Having data history
- Better templates for a project
  - Taking the time to input the correct categories prior to the project
  - Project managers
- Statement of work
  - Has generalized and more specialized
  - Haven't been taking full advantage of this feature
  - Lack of follow through for making tasks, causes the generic template to be used
  - Project manager would take the responsibility for entering the tasks
- No additional advice for us
  - Likes the idea of notifications
- About a half hour making the report, each week
  - Tweaks tables on a per-week basis

## Subject 8

- How do you interact with Harvest?
  - To track all project's budgets and all the resources on the projects. (Project Mode)
  - Support Services ( For support, time is logged by resources, but at the end, time is invoiced and then sent to the client)
  - Project work is typically fixed bid ( doesn't affect billing per say )
  - Usually at the end of the each calendar month for support
  - More often than not, just export the data. Normally pulling out the data but sometimes it needs to be massaged. Normally dump into excel.
  - Clients are not provided with any kind of report (don't take the time data to look at budget status, usually use the dashboard in Harvest).
  - Typical Week, more just monitoring projects and inputting own time, at the end of the month it's more creating reports.
- Report
  - Resources name that worked on it. Comments column and hours worked. (Delete other columns – Back up bills with an hourly breakdown report).
  - Not friendly with ad-hoc reporting or cross linking of projects ( business intelligence reasons )
  - One of the biggest things is the support services for clients (most visible).
  - People don't know the right place to enter time
  - Need on a side note to do more internal training – Handbook.
- **This is the proper way to approach harvest! ←have not done this**
  - Everyone kind of does it different (some people use weekly view, day view etc.) Push to data down as often as possible.
  - Because they put a lot of developers into harvest at a time
- Global hotkey for the timer?
  - Can submit recommendations for harvest improvement (a lot of it is we don't know what we don't know, possibly a lot of ways to use harvest.
  - More ability to do ad-hoc querying.
  - Ability to run reports across different groups (i.e. Last week by QA Dept.).



## Appendix F: Interview Summaries and Key Points

### Subject 1

#### *Interview Summary*

Subject 1, uses Harvest every day to submit hours and once a week to generate reports. She understands that many of those who are submitting hours feel that Harvest is a burden, but she appreciates the benefits of accurate reporting due to her corporate background. Subject 1 said that she tracks her hours in 15 minute increments to better report what she works on. That way tasks over the course of a day do not get grouped together and the true accurate data is not lost.

For reporting, Subject 1 runs a weekly report each Monday for the two groups she represents: Quality Assurance and Production Support. In these reports, Subject 1 is looking for a breakdown of where the time in her groups was spent. These reports can answer questions like: “How many hours were spent on this ticket?” It takes her about two hours to run these reports and get the data she needs. She ends up with a report in Microsoft Excel and a few slides breaking down the time spent in Microsoft PowerPoint.

Since a ticket may touch both Quality Assurance and Production Support, it is necessary to put the ticket number in the notes field for reporting. However if anything other than the ticket number (including a space) is added then it will be difficult to track and group together. Velir uses FogBugz for bug and ticket tracking however there is currently no FogBugz integration with Harvest.

Aside from better report generation and FogBugz integration Subject 1 mentioned that it would be useful to have more notifications from Harvest so that any issues, like an employee failing to record work hours, can be proactively caught. She would also like to see employees enter more accurate data, if possible.

#### *Interview Key Points*

- More notifications to be aware of what is happening at all times and react to problems while they are happening.
- Integrate FogBugz and Harvest together to help create more accurate reporting.
- The ability to sort and tie data together in Harvest to create more specialized reports.
- Increasing accuracy in reporting by using 15 minute intervals.

### Subject 2

#### *Interview Summary*

Subject 2 is a software developer who has been working with Velir for two years. His interaction with Harvest is essentially limited to inputting his timesheet. Overall, Subject 2 states that everyone is happier with Harvest as opposed to the old system. The ability to track time online through the web is very convenient as well as the existence of an iPhone app.

Subject 2 does not enter information granularly but in one huge chunk, usually at the end of the week. Some of the issues that he runs into while using Harvest is that there isn't a lot of clarity around what's being built, how should something be entered, where something should be entered (support task vs.

development topic),and sometimes lack of information as to where something will be going after it's built. One of the things that Subject 2 likes about Harvest is the notion of a timer; however, Subject 2 finds it unpractical in the everyday setting that he works in. Subject 2 might be interrupted to answer a quick question, have to respond to a bug report, etc. As a result, the timer itself isn't very accurate because often it's forgotten. Subject 2 will come back to his desk to find that the timer says he worked two hours on one task, but really he might have spent 20-30 minutes of working on another that had come up unexpectedly.

Another key issue that Subject 2 mentioned is that he doesn't really feel pressure from management to track time. He states that if he ever got the feeling that it is very important to management to really track his work every 15 minutes, he would do so.

One of the things that Subject 2 would like to see implemented, that he feels would increase accurate Harvest usage, is a statistics feature. It would be nice to look at how many hours a developer has put into one project as whole, how you compare to the estimates, productivity features, and even compare himself across the department as a whole with anonymous productivity statistics.

#### *Interview Key Points*

- One of the key issues with Harvest is that there is not a lot of clarity around what is being built and how something should be entered into Harvest.
- The timer is a great feature but really is not able to keep up with normal day interactions.
- A possible feature would be to add global hotkeys. Finally, there is not a lot of pressure from management to track time. If Subject 2 felt that management was really pushing for granular tracking, he would do it.

### **Subject 3**

#### *Interview Summary*

Subject 3, Director of Sales and Marketing, uses Harvest on a very limited basis. Subject 3 only submits his hours and views budget data for clients. Subject 3 does not currently generate any external reports outside of Harvest. Subject 3 would like to be able to easily see project data for clients, across different projects, to help with the marketing work he does. Subject 3 would like to see an average and a basic distribution for these numbers as they are helpful for creating quotes and quickly assessing any previous projects from Velir. Subject 3 also wants to know why timesheets need to be submitted for approval since there is no one assigned to approve them. He believes that the wording should be changed to be "save".

#### *Interview Key Points*

- Would like to see better overview on project resource allocation to help with estimating and quoting new projects Velir takes on.

## Subject 4

### *Interview Summary*

Subject 4, President and CEO of Velir does not utilize Harvest extensively. Subject 4 only uses Harvest for generating invoice data which eventually goes into the accounting software, QuickBooks. Currently Velir's invoicing process is very manual and has little automation. For fix bid projects, estimation for hours is assisted by previously completed projects of similar scope. Subject 4 identified the issue of employees forgetting to enter their data or not entering data as accurately as possible. However, Subject 4 feels that this issue is mostly outside of our scope and is a problem with people (not software). Subject 4 would like us to follow the common thread throughout our interviews and help make Harvest a better tool.

### *Interview Key Points*

- Create notifications for better reporting and automate error checking.
- Generation of invoices automatically, or to some template in Excel.
- Input more accurate hours into Harvest.

## Subject 5

### *Interview Summary*

Subject 5, Director of Systems Analysis and User Interface at Velir, uses harvest to track analyst timesheets. Subject 5 spends time in Harvest verifying that his reportees have put in their hours. He feels that Harvest is a leaps and bounds above the old system but there are some issues that he would like addressed. One of the most important issues is data. Reports coming out of Harvest are only as good as the data going in. With that in mind, Subject 5 would like to see some innovative approach to enhancing the input data. To accomplish this, it is critical that all employees understand the importance of accurate time tracking.

In line with the theme of accurate time tracking, one issue that is problematic is which bucket times are assigned to. Employees might input time into one bucket when it should really go into another. This causes disparities in the data as well as inconsistency. Consistency, however, must be approached differently for the different roles at Velir. A project developer will typically only work on one project, making time tracking straightforward and relatively easy; A production systems developer will typically be working across projects, which adds complexity, given the existence of various other buckets; Analysts start to become a lot more vague as a lot of work that they accomplish tends to happen in ad-hoc meetings, hallway conversations, and questions asked by developers over the course of the day; Project managers may spend a lot of time on e-mails with various clients which brings up the problem of figuring out how to add the time for each of those clients in a consistent and accurate method.

Some of the things Subject 5 would like to gather from Harvest include looking at the timesheets of his reportees, getting a window into what people are working on and tracking their progress, and finally project resourcing with analysts. Some other things he would like are knowledge and setup of the invoicing module available to Harvest, looking at alternative ways to enter time, and a survey that looks at the effectiveness of the buckets and their naming. The bucket effectiveness is an especially important

topic as it determines billable and non-billable hours which have a direct effect on the bottom line. Subject 5 also discussed the importance of QuickBooks and the dependency that Velir has on that application. However, there are a few quirks about QuickBooks that he hopes can be addressed in Harvest. One of them is that Project Managers do not have access to QuickBooks. This means that PMs have no insight into what' been invoiced and what has not. PMs are therefore placed in the awkward situation where it is their responsibility to invoice but are actually removed from being able to see the information they have entered.

### *Interview Key Points*

- Subject 5 would like to be able to track progress throughout a project including time spent and time budgeted.
- He would also like to track project progress by analyst. Another key issue is the ability to look at the current project resourcing and compare it to estimates.
- Finally, he would like to see an assessment of the Harvest invoicing capabilities.

## **Subject 6**

### *Interview Summary*

Subject 6, Chief Operating Officer, spends quite a bit of time in Harvest every day. Subject 6 would like to see trending budget statuses made available to help with his weekly invoicing of clients. Subject 6 also spends a great deal of time looking at staff billing totals and focuses on those outliers who are not submitting their hours in appropriate areas, are working more than forty hours, and employees that are trending to working more than forty hours a week. Subject 6 also spends a significant number of hours in FogBugz looking at the staff billing totals to see the billing status. For client support, Subject 6 looks at the ticket number and cross references the ticket number with the project.

Subject 6 feels that having notifications for reacting to staffing or billing issues would be very useful. Since Subject 6 is always monitoring and combing through data, in some scenarios, it would be very useful to have notice via an email. Since budgets need to be enforced, the closer to real time that Subject 6 can track the budgets the better. Subject 6 also noted that it would be very useful to have a trend prediction for predicting budget information in the future. Tying more historical into the Harvest reports would help make for more accurate decisions to be made and would make things easier for Subject 6.

Currently Subject 6 creates invoices by using QuickBooks. Prior to Harvest, QuickBooks used to serve as the time tracking tool for Velir. Subject 6 would like to have a generic invoice template to use to reduce the amount of time he spends formatting invoices. Subject 6 would like to see a gap analysis of Harvest to see if there are any areas that Velir can improve or utilize Harvest better. While it doesn't directly affect him, Subject 6 believes that creating some kind of link between FogBugz and Harvest would be helpful in reducing wasted time in manual processes. Finally, Subject 6 would like to see what is available in Harvest that Velir is not currently utilizing.

### *Interview Key Points*

- Create a more automated invoicing process.

- Notifications for certain cases to help reduce errors from entering the data.
- Better integration with FogBugz and Harvest to help abstract redundant data.

## Subject 7

### *Interview Summary*

Subject 7, Director of Development, does not spend a significant amount of time in Harvest. Between entering his hours and creating reports, Subject 7 estimates that he spends about two hours per week creating reports and entering his hours into Harvest. Aside from putting his hours into Harvest, Subject 7 runs two small reports every week. As a manager Subject 7 is interested in the reports in order to stay on top of employee staffing and project resource allocation. Subject 7 is very concerned about the number hours spent by his workers in a week and is looking for abnormalities. An employee with any significant deviation in the typical forty hour week would be considered an abnormality.

For tracking projects, Subject 7 is interested in the amount of collective time spent on a project and if the project is on target to meet the budget. Subject 7 is interested to see how Velir is at estimating the amount of time needed for a project and is constantly working to refine the estimates. To generate his reports, Subject 7 exports Harvest time data into Excel and creates a PivotTable. Subject 7 does not utilize the Harvest reports for anything. Before finalizing a report, Subject 7 has to check the data to make sure all employees are accounted for. Subject 7 has discovered that if an employee does not enter their times, Harvest does not export their name so he manually has to check who is accounted for.

Subject 7 believes that better notifications from Harvest would be a great productivity gain. This would allow him to stay aware of issues (like people not reporting their times for the week or working over 40 hours) and be less reactive to issues that come up. Subject 7 does not spend much time in FogBugz and does not run any other reports related to Harvest or time data. Subject 7 believes that if project managers were to input better tasks for each project, instead of using generic tasks, everyone could benefit by more granular reporting. Finally, Subject 7 believes that tying more historical data in Harvest would be beneficial to see how trends over a longer period of time and possible across many projects.

### *Interview Key Points*

- Reports with hours and time spent on each project, over time with history.
- Notifications or reports of people who have not submitted times.
- Alerts for both people and projects that are above or under a certain threshold of hours.

## Subject 8

### *Interview Summary*

Subject 8, director of accounts and project management, uses harvest to not only enter his own time but also to generate reports on project resources as well as support bills. When generating reports, more often than not, Subject 8 will dump the data from harvest into excel and massage it into the form he desires. One of the biggest priorities for Subject 8 is support services reports for clients. Another important item is to look at some sort of internal training to standardize how users input their time as many issues arrive from users entering time in the wrong bucket.

### *Interview Key Points*

- Excel Report Template for Harvest would be significantly beneficial
- Interested in cross linking projects for business intelligence
- Internal training handbook for standardization of Harvest time entry

### **Velir MQP interview questions**

How do you interact with Harvest?

What, if any, reports do you generate using Harvest?

If you generate reports, are you satisfied with the reports that are generated from Harvest?

What information is currently missing from the reports that you generate?

What questions are you trying to answer with Harvest reports? What decisions get made from these answers?

What do you do with the reports you generate from Harvest?

Are you overall satisfied with Harvest?

What would you add to Harvest, if you could?

Do you have any suggestions for us? Would you like to add anything?

## Appendix G: Advisor Meeting Agendas

### September 2<sup>nd</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #1 -- September 2nd, 2011

#### What we did:

- Met with Tiven to discuss some details about the requirements set forth on the project handout
  - Wanted to clarify a number of points
  - Helped gain a basic understanding so we can formulate interview questions
- Formulated rough ideas for interview questions
- Sent out requests for interview to 7 employees next Wednesday
- Created a test Harvest
  - Populated it with a replica of Velir data
- Wrote a summary of the project
- Documented functional and non-functional requirements set forth by Velir
- Registered for the MQP
- Created a mailing list
- Created a SharePoint for collaboration

#### Intentions:

- Further plan interviews
  - Brainstorm on what information we want to gather for the interviewee
  - Continue to work out times
  - Create questions
  - Document responses
- Work with test Harvest environment
  - Run test reports and begin experimenting with built in Harvest features
- Research API
- Secure trials or licenses to third party applications like Tableau

#### Questions & Concerns

- Are we doing okay?
- Any suggestions for our interviews?

### September 9<sup>th</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #2 -- September 9<sup>th</sup>, 2011

#### Topics:

- Review 09/02/2011 Meeting Notes
- Old business
  - Review 09/02/2011 deliverables
    - Intro
- New business
  - Actions taken since last meeting
    - Created Gantt chart
    - Planned out A term Schedule

- Harvest accounts setup
- Full replication of Velir's Harvest Installation
- SharePoint created
- Interviews conducted to date
  - Mary Kate McArdle
  - Aaron Cross
- History inquiry for Velir
- FogBugz / Harvest Integration research
- Reviewed previous MQP submissions
- Review new deliverables
- Closing comments

Deliverables:

- Gantt Chart
- Velir Bio

### September 16<sup>th</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #3 -- September 16<sup>th</sup>, 2011

**Topics:**

- SharePoint Training
- Methodology rough draft
  - Interview section
  - Systems development styles
- Three interviews from this past Wednesday
  - Tiven Weinstock- Director of Sales and Marketing
  - Mark Gregor- President and CEO
  - Adam Ribaud- Director of Systems Analysis
- Working on revising on revising and continuing the introduction and project summary of the paper

**Works in Progress:**

- Work Plan
- Interview Analysis
- Methodology section

**Tasks for next week:**

- System Selections
- System Requests
- Feasibility
- Risk Analysis

**Plans for next week:**

- Interview Dave Valliere

**Questions/Concerns:**

- What would you like to see by the end of the term?
  - Presentation?

### September 23<sup>rd</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post



Velir Project Tracking System MQP  
Project Advisor: Professor Eleanor Loiacono, Ph. D  
Meeting #4 -- September 23<sup>rd</sup>, 2011

**Finished for this week:**

- Interview with Dave Valliere
- Methodology
  - Interview
  - SDLC
- Feasibility Analysis
- Interview Summaries for
  - Mary Kate
  - Dave
  - Aaron
  - Tiven
  - Adam
  - Mark
- Get Velir FogBugz account
- Work on FogBugz background

**Works in progress:**

- Company Hierarchy Chart
- System Request
- Setup FogBugz test
- Interview with Corey (last interview)

**Plans/Tasks for next week:**

- Get in contact with Corey
  - Last person to interview
- Start putting together first draft of proposal for review

**Questions/Concerns:**

- Draft for proposal okay for next week?
- Thoughts on how we are progressing?

**September 30<sup>th</sup>, 2011**

Matthew Dodd, James Ham, Alexandria Haney & James Post  
Velir Project Tracking System MQP  
Project Advisor: Professor Eleanor Loiacono, Ph. D  
Meeting #5 -- September 23<sup>rd</sup>, 2011

**Finished for this week:**

- Interview with Corey
- Compiled rough draft of the proposal
  - Started Appendixes
  - Still missing a few pieces
    - Abstract
    - Controlling and direction
- Drafted up System Request
- Completed Interview key points
  - Put all interviews together into one document

- Met with Tiven to discuss outstanding issues

**Works in Progress:**

- Hierarchy Chart
  - Tiven emailed Dave but not sure if they can share it outside of company
    - Waiting to hear back
- Meeting with Mike Dolan next Wednesday
- Proposal revisions

**Plans for this week:**

- Proposal
  - Another rough draft all parts finished

**Questions/Concerns:**

- Feedback for proposal?
- End of A term presentation?
- Issues with poor communication from Velir.

**October 7<sup>th</sup>, 2011**

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #6 – October 7<sup>th</sup>, 2011

**Finished this week:**

- Small updates and revisions mentioned at last week's meeting
  - Interview summaries and key points

**Works in Progress:**

- Hierarchy Chart
  - Haven't heard back from Tiven
    - Asked for update over email and in person
  - Probably going to have to make our own
- Mike Dolan interview
  - Postponed our interview this past Wednesday (again)
  - Hopefully meeting with him next weds.
- Revising Proposal
  - Looking for comments

**Plans for this week:**

- Proposal
  - More revising
- Start working on presenting proposal to Velir

**Questions/Concerns:**

- Round two draft?
- Prepare presentation?
- Plan for work over break?
- Meeting next week?

**October 28<sup>th</sup>, 2011**

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D  
Meeting #7 – October 27<sup>th</sup>, 2011

**Finished this week:**

- Plan for project execution
- Proposal revision
- Organizational chart
  - Potential changes
    - Waiting on Tiven/Dave
- Final interview key points and summary
  - Last interview with Mike Dolan

**Work in Progress**

- Continue working on revisions
- Start working on proposal presentation
- Proposal
- PowerPoint presentation

**Plans for this week**

- Getting up to speed with project
- More revisions to the proposal
- Finishing PowerPoint presentation

**Discussion**

- When should we expect the proposal presentation to happen?

**November 5<sup>th</sup>, 2011**

Matthew Dodd, James Ham, Alexandria Haney & James Post  
Velir Project Tracking System MQP  
Project Advisor: Professor Eleanor Loiacono, Ph. D  
Meeting #8 – November 4<sup>th</sup>, 2011

**Finished this week:**

- Proposal PowerPoint presentation outline
- Multiple revisions on the proposal document
  - Design section added
- Mockup created

**Plans for this week:**

- Finish up the final revisions to the proposal

**Works in progress:**

- Revisions
- Working mockup
  - Code needs to be written
  - Layout needs to be replicated

**Completed this week:**

- Second paper revision

**Discussion:**

- Possible date for proposal
- Final revisions and dates for feedback

**November 11<sup>th</sup>, 2011**

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #9 – November 11<sup>th</sup>, 2011

**Finished this week:**

- Proposal PowerPoint
- Revisions complete on the proposal document
- Mockup revised
- Setup version control software

**Plans for this week:**

- Presentation at Velir
  - Wednesday November 16<sup>th</sup>, 11AM
- Continue to work on backend design

**Works in progress:**

- Building system
  - Coding
  - Testing
- Planning for implementation section

**Discussion:**

- Final comments or revisions
- Sending files to Tiven
- Any revisions to schedule for next week

### November 30<sup>th</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #10 – November 30<sup>th</sup>, 2011

**Finished this week:**

- Revisions to implementation section
- Send Velir final Proposal Document
  - Received it Tuesday (November 22<sup>nd</sup>)
  - Followed up regarding their progress with the document

**Plans for this week:**

- Work on coding system
- Further develop implementation section
- Wait to hear back from Velir and prepare any needed corrections

**Works in progress:**

- Building system
  - Coding
- Further expansion for implementation section
- Further refinements for Proposal

**Discussion:**

- Is there any additional work we should be focusing on?
- Should we set the next meeting time and date?

### December 7<sup>th</sup>, 2011

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #11 – December 7<sup>th</sup>, 2011

**Plans for this week:**

- Proceed with coding system
- Continue looking into Camtasia
- Wait to hear back from Velir and prepare any needed corrections
  - Send follow up email to Tiven
- Deliver outlines
  - Last week and this week

**Works in progress:**

- Working on system
  - Coding
  - Testing
- Camtasia Tutorials
- Further refinements for Proposal
- Weekly summaries

**Discussion:**

- Plans for break?
- Meeting next week?

**January 18<sup>th</sup>, 2012**

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #12 – January 18<sup>th</sup>, 2012

**Finished this week:**

- Four of eight coding objectives reached
- Revised coding milestones based on Velir feedback
- Created summaries of completed tasks to be included in Velir update
- Attended Camtasia presentation
- Worked out meeting times and schedules
  - Group meetings
  - Advisor meeting

**Plans for this week:**

- Send Velir an update with our term schedule
  - Including requested samples of XML exports
- Attempt to schedule a meeting with Velir to demonstrate current progress
  - Shooting for next Wednesday
- Make test Camtasia presentation
- Look for any update or feedback from Velir regarding our progress report

**Works in progress:**

- Continue to work on system
  - Testing
  - Coding
- Camtasia testing and tutorials

**Discussion:**

- What should we do regarding a meeting next week, if we are at Velir?
- Additional suggestions or guidance for the beginning of the term?

## January 25<sup>th</sup>, 2012

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #13 – January 25<sup>th</sup>, 2012

### Finished this week:

- Put together an update for Velir
  - Includes our schedules
  - Short video highlighting different features we want to use on our final video
  - Sample reports
  - Coding progress
  - Clarification on the system
- James Post and Ali met to create a schedule for the interactive training and manual

### Plans for this week:

- Setup meeting with Velir
- Work towards the fifth coding objective
- Startup work on the document
- Get Velir to sign off on proposed changes

### Works in progress:

- Continue with Camtasia video work
- Systems Documentation outline
  - FAQ section
- Tightening up final report
- Coding system

### Discussion:

- Skype meeting next week?

## February 1<sup>st</sup>, 2012

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #14 February 1<sup>st</sup>, 2012

### Finished this week:

- Sent out the update document to Velir
- Created a rough outline for the system manual
  - Would appreciate feedback on that
- Updated the methodology section
- Continued work on coding the system

### Plans for this week:

- Work on FAQ section
  - Hope to get more insight on this from Velir
- Get feedback on writing in order to revise for next week
- Get signoff on the proposal document
- Finish coding first fully automated report

- Almost complete
- Continue progressing with final document for next week

**Works in progress:**

- FAQ section of documentation
- Tightening up final report
  - Preparing to submit a rough draft next week
- Coding system and working on our objectives

**Discussion:**

- Meeting next week at 1:30PM, in person?
- Any additional requirements for turning in the first rough draft next week?

**February 8<sup>th</sup>, 2012**

Matthew Dodd, James Ham, Alexandria Haney & James Post  
 Velir Project Tracking System MQP  
 Project Advisor: Professor Eleanor Loiacono, Ph. D  
 Meeting #15 February 8<sup>th</sup>, 2012

**Finished this week:**

- Updated the methodology section with feedback from Velir (from meeting last week)
- Continued work on coding the system
- Did research in potential new area for Power Pivot
- Everyone getting up to speed with Power Pivot
- More revisions and additions into the Final Document
- Reviewed MQP checklist

**Plans for this week:**

- Create FAQ documentation
- Draft the Camtasia storyboard
- Proceed down final path for changes with Velir
- Work on second draft of the MQP document
- Assess feedback from rough draft submitted last week

**Works in progress:**

- FAQ section of documentation
- Tightening up final report
  - Preparing to submit a rough draft next week
- Coding system under revised objectives
- Getting better familiarity with Power Pivot

**Discussion:**

- Skype meeting next week?
  - If not, same time and same place?
- Revisions schedule?

**February 15<sup>th</sup>, 2012**

Matthew Dodd, James Ham, Alexandria Haney & James Post  
 Velir Project Tracking System MQP  
 Project Advisor: Professor Eleanor Loiacono, Ph. D  
 Meeting #16 February 15<sup>th</sup>, 2012

**Finished this week:**

- Revised final document per comments and suggestions last week

- Sent via email this morning
- Power Pivot training
- Review MQP checklist
- Met with Corey and Tiven regarding system coding progress

**Plans for this week:**

- Final Changes for Velir
- Finish prototyped development
- Work on documentation
- Finish Camtasia storyboard
- Continue revisions on final document
- Start working on poster

**Works in Progress:**

- FAQ documentation
- Final Report
- Power Pivot system development

**Discussion:**

- Meeting next week?
  - Same time and place?
- Any other developments we should be concerned with?

**February 22<sup>nd</sup>, 2012**

Matthew Dodd, James Ham, Alexandria Haney & James Post

Velir Project Tracking System MQP

Project Advisor: Professor Eleanor Loiacono, Ph. D

Meeting #17 February 22<sup>nd</sup>, 2012

**Finished this week:**

- More revisions to the final document
- Review MQP checklist
- Set up time and date for final presentation
- Meeting with Corey regarding system and deliverables
  - Sent a list of reports templates that are being generated

**Plans for this week:**

- Submit final revisions by the end of the week
- Submit final presentation draft
  - Prepare for presentation
- Put final touches on software we have coded
  - Clean up code
  - Finalize the documentation
- Get implementation section flushed out

**Works in Progress:**

- Poster
- Completed report



- Power Pivot templates
- Implementation final

**Discussion:**

- Does the 29<sup>th</sup> at 1PM work for the final presentation?
- Final round of drafts this Friday
  - Is that okay? Thoughts?
- Practice presentation next week?
  - When would work best?

## Appendix H: Minutes of the Advisor Meeting

### September 2<sup>nd</sup>, 2011

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

- Must include all available methodologies in MQP.
- Must explain why all we made the choices that we did
  - Planning and analysis
    - What is happening?
    - What is A term? What is B Term? What is C Term?
    - A term will be more fully described
    - Gant Chart
    - Systems request is in the book
    - Explain it in the text.
- If we do a System's request, we must use the template in the book as a guide. Describe what we did in the text and then say "see appendix a with the System's Request.
- Want to use Graphs, Charts, Tables, and Figures...
  - Utilize graphs / tables to really root the point you are trying to get across.
  - Cite the book
- Part of analysis will start in A Term.
- Grading – A, B, C ::
  - If she says, we need to do this this and this, and we do this, this and this, it will be a B.
  - If she says, we need to do this this and this, and we do this, this, this, and that. It will be an A.
- Kiosk system.
- Must make a Poster for the MQP Project Presentation Day.
- Glossary of Key Terms. References, bibliography.
- Want to cite usage of interview technique. Is it two on one? How do you develop the interview questions?
- Utilize Tiven.
- We think people involved in sales would be looking at this and this kind of data.
- Want to have a script for the interview
- A bottom line of the finance
- What are the benefits? Must translate into money.
- How much do you save? How much productivity will increase?
- If we did this, how many hours is this going to save you?
- Your return on investment is so and so. This project is paying for itself.
- Makes your life easier and saves you money.
- Keep adding to things
- Start developing.
- Template of an outline.
- Start filling it out.
- We met on such and such date for kick-off meeting
- If they ask why we did something, we can pull up a reference and justify why we did it the way we did. Support for what we are doing.
- Get a Gantt Chart
- Have introduction done for next week

## September 9<sup>th</sup>, 2011

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

- Matt:
  - Conducted two interviews
  - Scheduled 3 interviews for next week
  - Completed test harvest environment
    - Everyone has an account
    - Full copy
- Professor Loiacono
  - Possibility of confidentiality forms
- Matt
  - Researching API for harvest
  - Third party programs Tableau
  - Used on top of harvest
  - This week:
- Professor Loiacono
  - Agenda:
    - SharePoint is what we are using
    - Harvest is what they are using
    - Other options
      - Want guideline to say advantages and disadvantages
      - Show which ones or multiple ones
      - What's the argument for it
  - After next week 4 weeks of A term
  - Relevancy of MQPs
    - See the structure of the MQP
    - Motivation for project
    - Objectives
    - Check out the format that it follows
  - Biggest concern is text
    - Framing and understanding and presenting
    - Learning to be done
  - What is everyone thinking?
- James H
  - Now that we have the harvest we can try and create the reports
    - Not aware on how to utilize harvest
    - Possibly no need for API they could use harvest
- Matt
  - See how they create reports
  - And how they create it
  - Not very streamlines
  - Could harvest do it or possibly and add on
- James H
  - Developers can't really see anything only managers
  - Some way he can see self-stats
    - Incentives
  - Anonymous stats
- Professor Loiacono

- Interviews and insights
- Education on Harvest and others
- Have people take leads on the two different sides
- All want to understand problems and systems
  - Specialization/ focus
- Educating yourself on what it does
- Don't know what they need and want
- Understand harvest better
- Incited down on paper
- James H
  - Sub analyst possibility
- Professor Loiacono
  - More in-depth in harvest or more in depth w. people
  - Taking notes from before
  - All need insight into harvest
  - Wise about the time spent
  - Summarize interviews
    - Gets incorporated into text
  - Appendixes that we will write off of it
  - Training video? Training Sessions?
  - What else can be incorporated
  - Think visually
  - What is the relationship btw Velir and MQP
  - Refer to the original handout from Velir
  - Writing up a lot of stuff
    - Interviews
    - Summary of harvest (education part)
- Interview write up
  - Interview protocol
    - questions you came up with
    - why your interviewing this person
  - question and response
    - part of appendix
  - key insights
    - numbers ...insight #1, #2(who supported it)
    - person # 1 said this...., person # 2 said this (1,2,3)
      - what we found consistently throughout
  - depends on what comes out of the interview
  - be specific need to support protocol and why you did it
  - Appendixes
    - Interviews
    - Protocol
  - Look up how to cite interviews
  - Explain it and then do it and then explain the doing it and then the result(basically for everything)
    - To-be system vs. As-is system
- Need to plan for proposal
  - Need to write things down

- Not enough info for feasibility yet
- For next week:
  - Interview write-ups
  - System request
  - Project charter
  - Work plan
  - Staffing plan

## September 16<sup>th</sup>, 2011

Present: James Post, Matthew Dodd, Alexandria Haney, James Ham, Professor Loiacono

- **Agenda Business**
  - SharePoint training
    - By Erin in the Library
- **Methodology**
  - Matt:
    - Interview section
  - Professor Loiacono
    - Where do you get this? Best practice?
    - Add: how –to- interviews methodology (Stacy Swartz)
      - Put to the top of the paper
      - Get from books, support
      - Type of methodology
      - Include actual interviews in tables or appendix
    - Revisions of the paper
      - Organization chart-CEO\_> directors->etc.
        - Current users
          - Managers
          - Engineers
          - COO/CEO
        - Spreadsheet/ table of all the people we've interviewed
      - How did we do it, what did we do, tables, spreadsheets
  - James:
    - Development styles
  - Professor Loiacono
    - Send it before the meeting so that she can review it and revise it (**by Thursday mornings**)
    - Types of options
      - Define
      - Tables and how we evaluate it (protocol, waterfall, etc.)
      - Options->then what our choice was
      - Chapter 2
- Interviews (3)
  - James:
    - Tiven
      - Not as much as other users
    - Mark
      - The direction of the company
      - Accomplishments

- Helped in writing about the company
      - Wants to expand
      - Engineering firm
        - Artist section
        - Engineering section
        - More specialization
        - Word of mouth
    - Adam:
      - FogBugz
        - Bug tracking system
        - Bugs in the web page
        - Personalized email per client
        - Application
        - Possible tie into harvest
        - API for both
          - 3<sup>rd</sup> party program that will tie both together
          - Would be in addition
    - Professor Loiacono
      - Keep the scope
        - Could be a project onto its self (FogBugz)
  - Works in Progress
    - Work plan
    - Interview analysis
    - Methodology
  - Tasks for next week
    - Try and get hard copies of reports
  - Meeting with Dave
- End of term
- Review doc (3x)
  - Then goes to Velir
  - Present to Prof presentation
  - Then present to Velir
    - Sign off sheet for proposal
    - Use methodology picture
    - Visual gauge where we are
    - Easy to follow format
    - Cost savings
  - Format of the report
    - Doesn't have to differ
    - Chapter 1, 2,3 (will be added to)
    - Methodology, selected and followed,
      - Parts that we have done will be more detailed
      - Rest is what we will do...
      - How this will be continued

## September 23<sup>rd</sup>, 2011

Present: James Post, Matthew Dodd, Alexandria Haney, James Ham, Professor Loiacono

### Agenda Business

- Meet with Dave Valliere
  - We have a summary of all the people we have meet with up until this point
  - Put all other interviews in perspective
  - Go thru each interview pull out key findings/concepts
    - When they are in the system what they want to see
    - What helps implement the system
      - Go into methodology
        - Interview would be attachments referred to
        - Key things would be put into the text
        - Talk about in essay format then a visual to aid(table/bullet points)
    - Building argument by analysis interviews
- FogBugz trial account
  - Short description
  - Features
    - Project management
- Hierarchy
  - Get it from company
  - Describe everyone and their jobs
    - Ask Tiven if they have an Org. chart
- System request
- FogBugz test
  - With Velir data not on their systems
  - Process of moving the data
- Feasibility study
  - Would we need to know what they are spending?
  - Analysis alternatives
    - Internal -someone else in the company doing it vs. external –us going it
      - How much time he would spend on it
      - Educated guess w. research
    - Feasibility to purchase something outside
    - Forces them to keep more track of the time
      - Could it be incorporated (any resistance)
        - From non-mangers
        - Training in the end
        - Eventually... Talk to management about how they need to talk to people to let them understand why it is important
          - How they benefit.
- Interview with Corey scheduled
- Summary of each interview print out and find key points
- Say the guidelines in the paper
  - We followed such and such guideline by....

#### Next Steps

- Putting it all together for the proposal
- Questions and concerns
  - **Proposals for next week on Thursday!!!**
- Need to get the proposal going
  - Write up and plan for the next steps

- Want to tell people what you can deliver
  - Don't want to retract what we say we can do

## September 30<sup>th</sup>, 2011

Present: James Post, Matthew Dodd, Alexandria Haney, James Ham, Professor Loiacono

### Agenda Business

- Finished interview Corey
- Have Mike Dolan Left
  - Next weds
- Put together first draft of proposal
  - Screen shot of Gantt chart
  - Agendas
  - Interview summaries
    - Spell everything out
    - Summary review by professor
- Chart
  - Table of the needs of the people
  - A need and then someone wants it?
 

<u>Need</u>	<u>Description</u>	<u>Sources</u>
Title		
  - In the text put some type of quote
- Next Step
  - Look into APIs
  - Is FogBugz and harvest tie in do able
  - Two people with expertise
  - Want the functionality
  - Prioritization
    - Need to understand what's there
      - Is it large can we do some small things as well
  - One screen that they go to
    - How would we present this?
      - if it was a dashboard it would be clean
      - if not how do we make it clean for each person
        - go to one place
        - or dashboard for one person
      - need to know how long it's going to take to be done
        - needs vs. wants in system requests
  - Hierarchy chart
    - If not be able to show do it best to ability
- Mike Dolan
  - Next week
- Proposal
  - Set up meeting week before break
  - Work on it over break
  - Won't get it back till like next weds
- Communication with Velir
  - Waiting to receive reports



## October 7<sup>th</sup>, 2011

Present: James Post, Matthew Dodd, Alexandria Haney, James Ham, Professor Loiacono

### Agenda Business

- Small updates
- Have Mike left again
  - Hopefully free next weekend
  - Director of accounts
- Send new updated proposal to professor with tables
  - Review and send back
- Need to get presentation ready for Velir
  - Presentation roughly an hour
  - Can we use prezi?
    - Sure
  - No because it is not private
- Possibly meet on a wednesday before break
- Start on presentation stuff

## October 28<sup>th</sup>, 2011

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

### Agenda Business

- Proposal revision
  - Everything updated
  - Add Mike Dolan part
- Starting slides
  - Up to date on how it's going to go down
- Plan for what we are doing
  - How are we planning on doing the proposal
  - Explain what we are doing
  - Website to export the data
    - Visuals, data visualization, colors?
    - Examples of how it's going to look
    - Want it for the proposal
    - Want them to be able to help you in the meeting
      - Is this what they are envisioning
        - They can give you inputs
      - Setting expectations
- Start design part
  - Be vague but put in as much as possible
- Paper
  - Explain the bullet and precursor text
  - Introduce the topic
  - Make it visual appealing
  - Add glossary
  - Timeline

- Proposal
  - Explain and go thru what we have done
  - Explain to them the benefits
  - Show the process
  - Incorporate what you're doing in the presentation into the document
  - Add in feasibility
  - Put some \$\$ into it
  - Time and money savings
    - Put in how it's being saved

### November 5<sup>th</sup>, 2011

Present: James Ham, Matthew Dodd, James Post, Professor Loiacono

#### Agenda Business

- Skype with the Professor on November 28<sup>th</sup>
- December 5<sup>th</sup>-9<sup>th</sup> she is in China
  - Scheduling still up in the air
  - Try to figure out a date and time
- Send an email to Tiven
  - Include the other 'stakeholders'
- Presentation
  - Methodology
  - Include payment information (and subsequent savings)
- Send to Dave or Tiven for early feedback
- Make additional pages for methodology
  - Explain the results!
- Tell how the data mockup came to be
- Write implementation section
- Talk about technical details
- Keeping it close to Harvest
- Project signoff at the proposal meeting
  - Look at other MQP's sign off sheets
- Bound, print, color copy
  - Wait for the Professor to okay everything
- Scan signoff sheet
- Leave them with a copy
- November 16<sup>th</sup> (early morning)

### November 11<sup>th</sup>, 2011

Present: James Ham, Matthew Dodd, James Post, Professor Loiacono

#### Agenda Business

- Problem statement/issues
- Reports that can help with decision making
- Out task comes after the methodology
- Problem statement becomes tasks we have accomplished

- Methodology so that nothing else was missed
- Graphic for planning
- Put dates next to Methodology waterfall
- Learning current process and applications
  - Prepare for our implementation section
- Add slide for analysis summary
- Choice of methodology for planning
- Analysis culmination with the mockup
- Ask for signoff
- Next phases are design and implantation
- ROI slide
  - \$10,000 for MQP
  - Savings of x per week/year/month
- Add references to the slides
- Integrate savings into analysis
- Conservative/liberal breakdown
- What we did during the design portion
  - Key points
  - Ideas

## November 30<sup>th</sup>, 2011

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

### Agenda Business

- Revisions for implementation
  - James P. sent out email to Tiven
  - Updated Implementation
    - user and system documentation
  - Tiven feedback?
- Coding the system
  - No front end yet
  - If that's not what they want them we won't create it
  - Need to be done anyway (backend)
- Write up (coding)
  - 1 or 2 page notes on what's being done each week
  - Goal so that it can get transferred into the paper
  - Updates/ 1 page summary
    - Able to refer back to it when writing up
    - Helps keep track of what is going on
    - If you have to learn something add that into there
      - Tutorials etc.
      - Can be more on the bullets side but needs details
  - Git-can add notes on there but also make one in word
- This week what we have done so far 28<sup>th</sup>-dec 2<sup>nd</sup> ;5<sup>th</sup>-10<sup>th</sup> ;10<sup>th</sup>-16<sup>th</sup>
  - Forward what we have done

- The next week receive feedback
  - 1 page per person , be able to write the paper off of it
- Meeting next week?
  - Try next weds
  - 11am
  - 12/7/2011
- Talk to academic technology center
  - See if there additional training
    - Modules?
  - Camtasia presentation
  - Demo on Camtasia, make it look professional
- Anything else to work on?
  - Manage feedback that they give us
  - Manage time table
  - Keep in contact
  - Plan of action!

### December 7<sup>th</sup>, 2011

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

#### **Agenda Business**

- Working with tentative schedule for coding system
- Querying harvest, meeting schedule so far
- Found out about excel?
  - James post sent Tiven email
  - Haven't had the internal meeting yet
  - Waiting for them to send back
- Going with the assumption that they are going with excel
- Working on File parsing
- Excel interface
  - Color with certain things showing
    - Conditional formatting
- Camtasia
  - Just look @ tutorials
  - Talk to ATC
    - They teach faculty about software
    - Jessica Karen-talk to her about Camtasia
      - May be able to guide us
- Delivering outlines...
  - Plan on giving then to Professor on Friday
  - Word doc describing what we have done
- Working on testing system
- Work on tutorials for Camtasia

- Continued working on proposal
- Contact Tiven by end of the week
  - See where they are
- Include update with Tiven in outlines
- Questions
  - Plans for break? Meetings Updates?
    - Keep working on what we have been doing
    - Sooner we get this done the better in the end
  - Meeting for Next week before end of term
    - See what feedback is first
    - Won't necessarily have to
    - Start getting front end looking good
    - Quick screenshots possibly next week
    - Need to wait for the go-ahead

## January 18<sup>th</sup>, 2012

### Agenda Business

- Meeting to finish 4/8 coding objectives
  - Send with update to Velir
- Revised coding milestones
  - Check w. Velir to make sure they agree w. proposal
- Working on completed task summaries
  - What needs to be done and methodology
- Camtasia Presentation
  - Came up with good concept
- Meeting times
- Send Velir update
  - Finalize proposal
- Meeting w. Velir next Wednesday
  - If needed Skype with professor for our meeting
  - Make sure we have the right use cases
  - Make sure people are happy
  - Taking notes and put them into the paper
  - One month from now Professor should be reviewing the document
- Test Camtasia Presentation
  - Possibly next Wednesday?
  - Need backend and frontend tutorials (how to make a report and how to update certain information)
- For the manual look at how they would train now
  - Short quick guide
  - FAQ guide
  - How to do a typical report
- Update and feedback from Velir
  - Make sure they feel were on track and what we produce is what they want

## January 25<sup>th</sup>, 2012

### Agenda Business

- Confirm and get sign-off from Velir
- Prepared for update
- Plan to send update today
  - Set up meeting times for next week
- Plans to work on final document
  - Week of 27<sup>th</sup> is presentation
  - Everything needs to be finished on the 20<sup>th</sup>
  - Professor needs to start looking at the document no later than the 6<sup>th</sup>
- POSTER
- Question on FAQ
  - Method to determine the questions
- On CD would be
  - Final presentation
  - Camtasia
  - FAQ
- Question
  - Should we Skype next week?
  - If we are going to Velir then yes to skyping

## February 1<sup>st</sup>, 2012

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

### Agenda Business

- Professor can give us feedback by Monday
- Follow the MQP checklist for what the final document needs to have
  - Matt can resend the list
- Send update for the status with Tiven and Velir
- FAQ question gathering is fine
  - Include general questions like:
    - Who maintains the system
    - Contact for questions in the future
    - The development cycle
- Send one file by the end of today

## February 8<sup>th</sup>, 2012

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

### Agenda Business

- Review checklist for missing items
  - Some small consistency changes
- Make sure things look good in color
- Past tense/future tense
  - Be consistent
- Need to talk about the decision making process

- Apply back to larger process
- How the project ended up working for us
- Create “decision for choosing” and how things ended up working out for us
- Being more specific for the terms, outlines, and plans
- Create a systems request
- Someone else to create the system
  - Avoid scope creep
- Need consistent citation for the interview section
- Intro for key point section
  - Writing the ranking order, include the number
  - Needs a refined methodology
  - Document the process on paper
- Make the design process creditable
  - Label and no headings
- Proposal section under design
  - Refer to appendix for additional slides
  - Comments
  - Internal decision making
  - Fix organizational chart
  - Do an improved feasibility chart
- Keep things simple
  - Cite all HCI guidelines
- Use track changes on Microsoft Word
- Poster for project presentation day
- Power Pivot user/administrative backend

## February 15<sup>th</sup>, 2012

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

### Agenda:

- Went through the packet
  - Added abstract, acknowledgement, general revisions and updates
    - Feedback for re-revisions: after the weekend
  - Power Pivot training
    - Installing and manipulating data
  - Reviewing MQP checklist
    - Planned and addressed everything except for the poster
  - Matt and James meet w. Tiven
    - Update on system
    - Asked about the system
    - Potential issues
      - Modularize system
    - Meet with him next weds.
      - Additional feedback
  - **Two more weeks left**

### Plans for this week

- Finish everything!!!!
- Camtasia Tutorial video

- Next feedback final
- Presentation the week of 27<sup>th</sup>
  - Need to notify Velir (today)

#### **Works in Progress**

- Documentation
- Finish Final Report

#### **Discussion**

-meeting next week either Skype or in person depending on location  
 -sign off sheet with everything ready to be delivered

### **February 22<sup>nd</sup>, 2012**

Present: Matthew Dodd, James Post, James Ham, Alexandria Haney, Professor Loiacono

#### **Agenda:**

- Final revisions going to get it in by today or tomorrow
- Set up time and date for presentation
- Matt talked to Corey about Deliverables
  - Asked to see the template reports
- Work on slides
  - Matt has a rough draft sent later today

#### **Plans for this week:**

- End of week for revisions
  - Want everything in it
  - FINAL
  - Want at least a draft
  - What we want to hand in to them as final project
  - Not necessarily the training manual
    - Explain it just don't need to attach it
- Do everything over the weekend
  - Final document
  - Training manual
  - Camtasia video
- Goal: don't want in pieces

#### **Discussion:**

- Presentation Weds 29<sup>th</sup> 1pm -2pm
- Sent to Professor no later than Monday so that we can get everything finalized
- Poster and PowerPoint



## Appendix I: Proposal PowerPoint



# Velir Project Tracking System Major Qualifying Project (MQP)

Matthew Dodd  
James Ham  
Alexzandria Haney  
James Post

Worcester Polytechnic Institute



## Agenda



- Introduction
- Problem identification
- Methodology
- Proposed design overview
- Future project development
- Conclusion
- Questions

Worcester Polytechnic Institute



## Problem statement



- Report generation process for employee time tracking is inefficient
- Exports contain unnecessary data
  - No control
  - No customization
- Repetitive tasks
- Time is being wasted with something that could be automated

Worcester Polytechnic Institute



## Our task




- Analyze and understand the existing processes surrounding the time tracking data
- Look at areas that could be improved by better use of available tools
  - Harvest
  - Excel
- Find and implement a solution to these issues

Worcester Polytechnic Institute

- Followed the SDLC (Systems Development Life Cycle) method
- Choose the Waterfall method in order to fit best with the MQP process



- Getting acquainted with Velir and the internal workflows
  - On site every Wednesday
  - Worked with our liaison, Tiven
- Set up our weekly advisor meeting
- Uncovering the true problem and planning for analysis

- 
- Interviews
    - Help better understand the process
    - Gather important facts
    - Standardized
    - Interact directly with employees generating the reports
    - Get demonstrations of processes

- 
- Group research
    - Set up development Harvest and FogBugz environments
      - Populated with production Velir data
    - Learned about Harvest and FogBugz
      - Online documentation
      - Webinars
    - Experimented and tested
    - Analyzed files sent by interviewees

Need	Description	Reasoning
Report Excel Template	The ability to have a preformatted report that is more detailed than the data dump from Harvest.	Save time generating reports and trimming the same data every week.
Timesheet Tracking	Better manipulation and filtering for entered time.	Helps sort employees individually or by project to get a better understanding for what is going on.


Worcester Polytechnic Institute

Need	Description	Reasoning
Notifications	Ability to track anomalies and alert designated people when applicable.	Help stay proactive instead of reactive to staffing issues that arise during a project.
Real Time Reporting	The ability to identify and react to projects staffing issues as they are happening.	Ability to track projects without compiling lots of data together.
Connect Harvest and FogBugz	Integration to create more accurate reporting for time spent on tickets.	Saves time in preparing reports and for tracking bugs during a project.

Worcester Polytechnic Institute



Need	Description	Reasoning
Invoicing	Better integration with QuickBooks or utilization of Harvest invoicing.	Saves time refining invoices in continually modeling invoices in the same way.
Timer Feature	Global hotkey for entering hours more accurately.	Helps encourage more accurate input of employee hours.

- 
- Took the data and came to a conclusion on a viable solution
    - Stay within our project scope
    - Offer opportunities for future expansion
    - Focus our efforts on something that will be most effective
    - An issue that impacts everyone

Our solution:

- Improve the interface for exporting data from Harvest
- Allow for more customization while generating reports
- Further develop the formatting for the CSV (Excel) export



## Design preview details



- Styled after the Harvest interface
- Simple and uncluttered
- Interface follows HCI (Human-Computer Interaction) guidelines
- Utilizes Harvest REST API (Application Programming Interface)
- Written using Ruby on Rails

Worcester Polytechnic Institute



## Mock up preview



The mock up shows a web interface with a green header bar containing the text "Welcome, Bob" and a "Logout" link. Below the header is a "Project Selection" dialog box with a yellow background. The dialog box contains a list of checkboxes for the following fields: Time Report, Username, First Name, Last Name, Employee Hours, Project Code, Task, and Notes. The "Last Name" and "Employee Hours" checkboxes are checked. An "Export" button is located at the bottom right of the dialog box.

Worcester Polytechnic Institute





- Styled after the Harvest interface
- Simple and uncluttered
- Interface follows HCI (Human-Computer Interaction) guidelines
- Utilizes Harvest REST API (Application Programming Interface)
- Written using Ruby on Rails

Worcester Polytechnic Institute



Last Name	Total October Hours	Hours/day
Norton	857	37.28
Caplette	775	33.70
Mathew	774	33.65
Brady	757	32.91
Dolan	752	32.70
Navarra	745	32.39
McArdle	675	29.35
O'Connell	655	28.48
Fraser	646	28.09
Garrant	645	28.04
Harrington	564	24.52
Rubin	454	19.74
Gupta	454	19.74
Goetz	445	19.35
DuRand	424	18.43
Delay	424	18.43
Mazzoni	222	9.65
Leggett	164	7.13
Distaula	111	4.83
Murphy	111	4.83

Worcester Polytechnic Institute



## Report preview details



- Allows for improved formatting of raw data
- Customization available
  - Individual users
  - Specific reports
- Formatted using the Excel XML Format

Worcester Polytechnic Institute



## Return on investment



- Estimated usage from interviews
- Calculated average earnings for Boston area
- Weekly savings estimated at \$1100
- Return on investment of 428% in the first year

Worcester Polytechnic Institute

- Process currently underway
- Will continue coding and working on the system
- Need your input on the design and concept
  - Sign off on the proposed design
- Working to style and integrate with existing processes

- Creation of documentation
  - Printed manual
  - CD with all files in digital format
- Creation of interactive training
  - Camtasia presentation and walkthrough
- Plans and ideas for future expansion of our system
- Will be included in the updated document

- Written proposal delivery next Monday
- Work has already begun on the system
  - Currently developing the backend
  - Recommend your input
    - Interface
    - Backend
- Next milestone is the final document delivery

- Gathered data on the Harvest usage within Velir
- Have identified a target improvement
  - Cost savings of \$1100 per week
- Created a proposed design interface
- System in development
- Proposal document delivered Monday
  - Includes analysis and design details
  - Implementation section is under development



Questions or comments



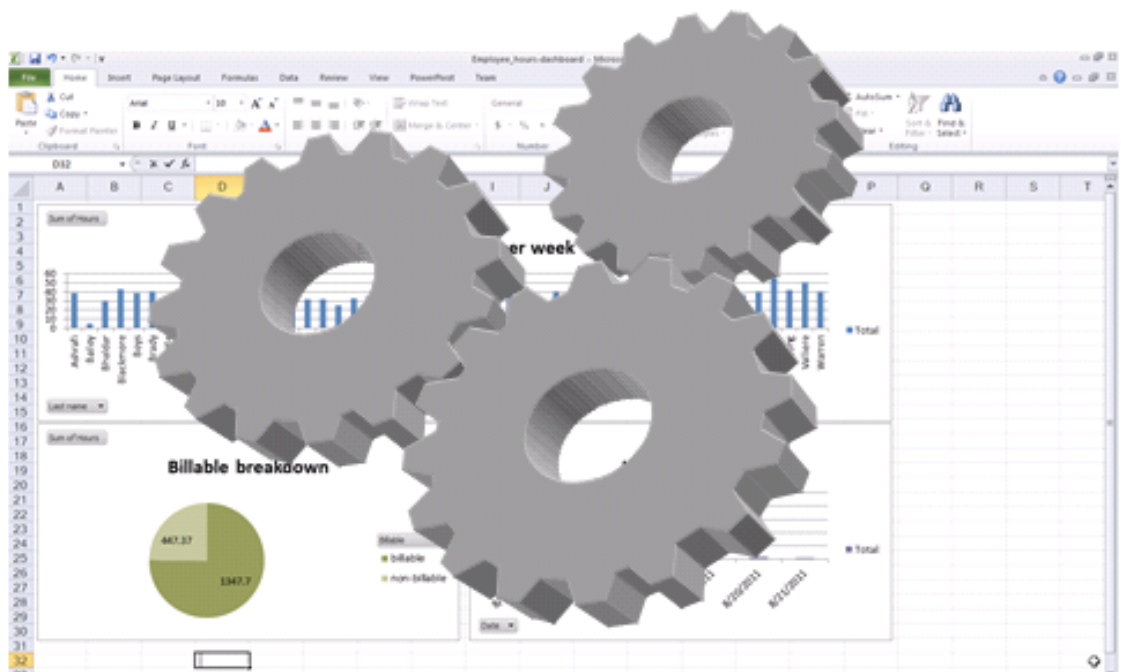
Any questions or comments?

Contact us at [mismqp@wpi.edu](mailto:mismqp@wpi.edu)

Worcester Polytechnic Institute

# Velir Studios: Harvest MQP Manual

Velir Major Qualifying Project Team: February 2012



## **[ PowerPivot templates Training Manual ]**

This document will serve to enhance the overall knowledge and ability of the Velir staff members in generating reports using specific PowerPivot templates the WPI MQP team has designed.

# Table of Contents

- INTRODUCTION..... 98
- 1. OBTAINING DATA FROM HARVEST ..... 99
- 2. UPDATE A REPORT TEMPLATE ..... 101
- 3. UPDATING A DASHBOARD TEMPLATE ..... 105
- 4. REPORT TEMPLATE DESCRIPTIONS ..... 108
  - Harvest PowerPivot templates*..... 108
  - Employee hours dashboard*..... 108
  - Employee last name and hour total report* ..... 109
  - Hours per project dashboard* ..... 110
  - Employee hours per project report* ..... 111
  - Hours per task dashboard* ..... 112
  - Employee hours per task report*..... 113
  - Project employee hour and budget dashboard*..... 114
  - Task employee hour and budget dashboard*..... 114
  - QA client incident dashboard*..... 115
  - QA project incident dashboard*..... 116
  - QA full incident status report*..... 117
  - Contractor hour dashboard*..... 117
  - Problematic dashboard* ..... 118
  - Department hour dashboard* ..... 119
- 5. FAQ ..... 121
- 6. CONCLUSION..... 123



## Introduction

Welcome to the Velir Harvest MQP reporting tool user documentation! This document is intended to provide you with a comprehensive guide to creating reports with a tool we have developed to function specifically with the Harvest time tracking software. This tool utilizes the Excel PowerPivot add-on.

Please note that PowerPivot is a requirement for these templates. PowerPivot is compatible with Microsoft Office 2007 and 2010. There is no PowerPivot add-in available for Mac OS X. Microsoft provides PowerPivot as a free add-on at their website which is below.

*PowerPivot for Excel:*

<http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=7609>

Due to the rapidly changing nature of PowerPivot, there is no step-by-step guide to installing PowerPivot in this manual. However, on the PowerPivot website there are up-to-date guidelines detailing this process.

*PowerPivot website:*

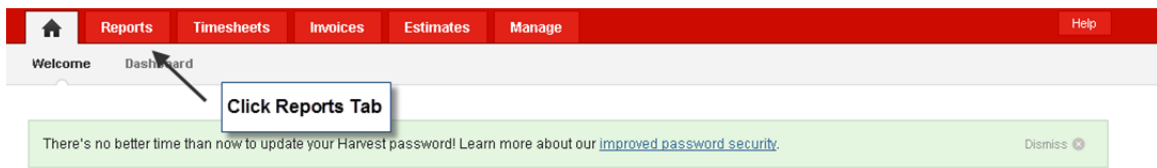
<http://www.microsoft.com/en-us/bi/powerpivot.aspx>

In the following pages will be step-by-step instructions for the generation of each report available using the tool we have developed. Textual explanations will be accompanied by screenshots and visual aids for additional clarity. Following the two step-by-step tutorials will be descriptions of each report that will be available to you by using the templates we have provided.

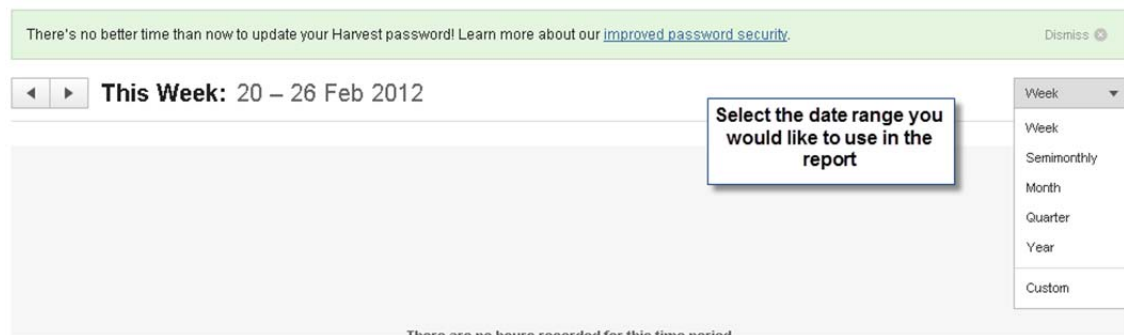


# 1. Obtaining data from Harvest

1. Open Harvest and click to the “Reports” tab at the top of the welcome screen



2. Select the appropriate date range that you would like the data in your report to accurately reflect.



3. Once you have specified an appropriate time period, click the “Export” button and select the “Excel” option from the drop-down menu. The file you will be asked to save will contain a spreadsheet of all reporting data available for that period of time. Save the file to an appropriate location.

There's no better time than now to update your Harvest password! Learn more about our [improved password security](#). Dismiss

**Custom: 13 – 20 Aug 2011** [Edit Timeframe](#) Custom

Hours Tracked **75%**

Billable Hours **\$0.00** Uninvoiced Amount **\$0.00**

Billable Unbillable

Clients Projects Tasks Staff

Name ▲

ACC 100.01 134.31 (81%) \$0.00

ACR 28.50 27.00 (95%) \$0.00

Export Detailed Report

Once a range has been specified, click the "Export" button and select the "Excel" option. Save the file to an appropriate loocation

4. Once you have saved the XLS data export to an appropriate location, open it in Excel. After opening, select all of the data in Microsoft Excel (do not select the column headings) and copy it to the clipboard. The next steps will depend on if you are updating a dashboard template or a report template.

## 2. Update a report template

Open the Harvest report and copy the entire data range to the clipboard

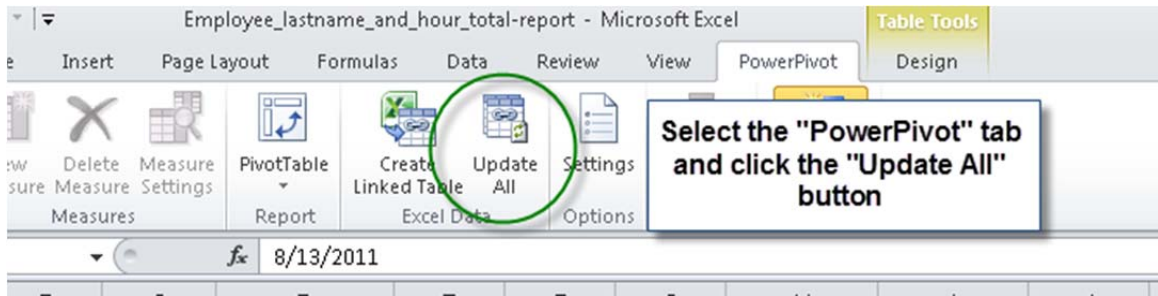
Date	Client	Project	Project Code	Task	Note	Hours	First name	Last name	Billable	Employee vs Contractor	Approved	Hourly rate	Cost	Department	Currency	Currency symbol
13-Aug-11				Vacation			Chris	Sulham	non-billable	employee	no			Development	United States	\$
13-Aug-11				Development reviewing s			Daniel	Delay	billable	employee	no	0.00	0.00	Development	United States	\$
13-Aug-11				Development			Gabe	Boys	billable	employee	no	0.00	0.00	Development	United States	\$
14-Aug-11				Project Ms Catching u			Dave	Valliere	non-billable	employee	no			United States		\$
14-Aug-11				Development reviewing s			Daniel	Delay	billable	employee	no	0.00	0.00	Development	United States	\$
14-Aug-11				Development Working o			Diane	O'Connell	billable	employee	no	0.00	0.00	Development	United States	\$
14-Aug-11				Production Prioritizing			Dave	Valliere	billable	employee	no	0.00	0.00	United States		\$
14-Aug-11				Training prep aux n			Teresa	Bailey	billable	employee	no	0.00	0.00	AUX	United States	\$
15-Aug-11				Vacation			Martin	Fowler	non-billable	employee	no			Development	United States	\$
15-Aug-11				Internal Ms			Mike	Gintz	billable	employee	no	0.00	0.00	Project Ms	United States	\$
15-Aug-11				Development GitHub iss			Paul	Gibler	billable	employee	no	0.00	0.00	Development	United States	\$
15-Aug-11				Support FB 7241: F			Chris	Castle	billable	employee	no	0.00	0.00	Production	United States	\$
15-Aug-11				Project Ms Technical i			Dave	Valliere	non-billable	employee	no			United States		\$
15-Aug-11				Project Ms Support M			Divya	Mathew	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms Stand-up,			Divya	Mathew	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms			Divya	Mathew	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Internal Ms QA check-			Divya	Mathew	billable	employee	no	0.00	0.00	Project Ms	United States	\$
15-Aug-11				Production			Ladan	Ashrafi	billable	employee	no	0.00	0.00	Production	United States	\$
15-Aug-11				Support 8039			Ladan	Ashrafi	billable	employee	no	0.00	0.00	Production	United States	\$
15-Aug-11				Project Ms Quickbase			Anissa	Talty	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms PLS updat			Anissa	Talty	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms knowledge			Anissa	Talty	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms call with P			Anissa	Talty	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Development Upgrading			Matt	Goetz	billable	employee	no	0.00	0.00	Development	United States	\$
15-Aug-11				Project Ms Follow up			Divya	Mathew	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Project Ms Follow up			Divya	Mathew	non-billable	employee	no			Project Ms	United States	\$
15-Aug-11				Production			Pete	Navarra	billable	employee	no	0.00	0.00	Production	United States	\$
15-Aug-11				Development FB 7832: s			Adam	Lamarre	billable	employee	no	0.00	0.00	Production	United States	\$

1. After copying the data to the clipboard, open the specific report template you wish to use and paste the data into the "FromHarvest" sheet of the spreadsheet. Be sure to paste the data in the upper left cell just below the "Date" column heading to replace the template data.

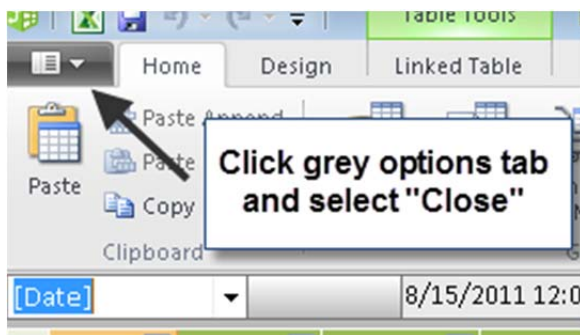
Paste the copied data into the "FromHarvest" sheet of the report template you wish to use

Date	Client	Project	Project Code	Task	Note	Hours	First name	Last name	Billable	Employee vs Contractor	Approved	Hourly rate	Cost	Department	Currency
13-Aug-11				Vacation			Chris	Sulham	non-billable	employee	no			Development	United States
13-Aug-11				Development reviewing s			Daniel	Delay	billable	employee	no	0.00	0.00	Development	United States
13-Aug-11				Development			Gabe	Boys	billable	employee	no	0.00	0.00	Development	United States
14-Aug-11				Project Ms Catching u			Dave	Valliere	non-billable	employee	no			United States	
14-Aug-11				Development reviewing s			Daniel	Delay	billable	employee	no	0.00	0.00	Development	United States
14-Aug-11				Development Working o			Diane	O'Connell	billable	employee	no	0.00	0.00	Development	United States
14-Aug-11				Production Prioritizing			Dave	Valliere	billable	employee	no	0.00	0.00	United States	

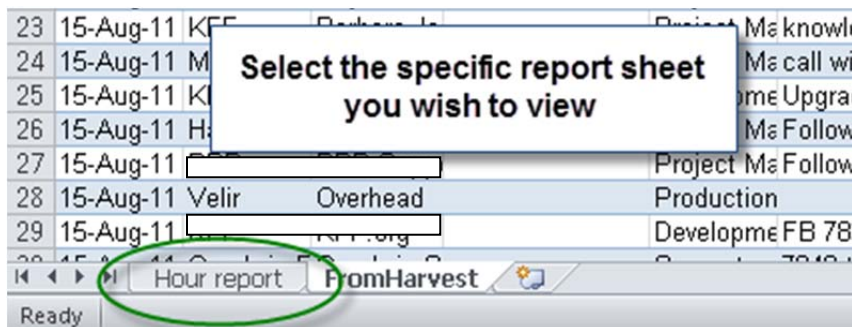
2. After pasting the data you wish to report into the "FromHarvest" sheet of the report template, select the "PowerPivot" tab at the top of the excel interface and click the "Update All" button.



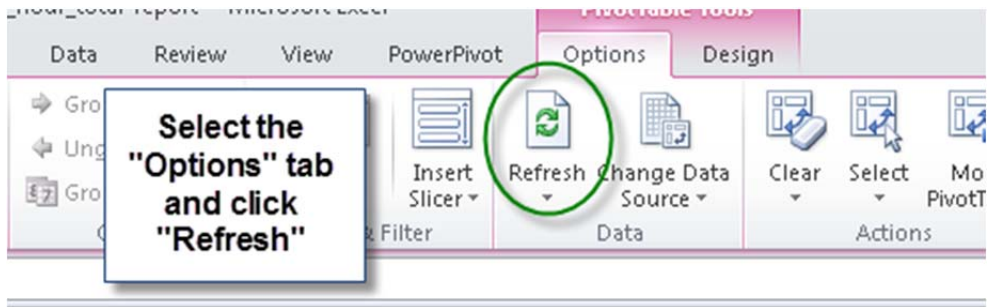
3. After clicking "Update All" a new window will appear with the data in a spreadsheet for PowerPivot. Scroll over to the upper left area of the window and click the grey options tab and click "Close" from the drop-down menu.



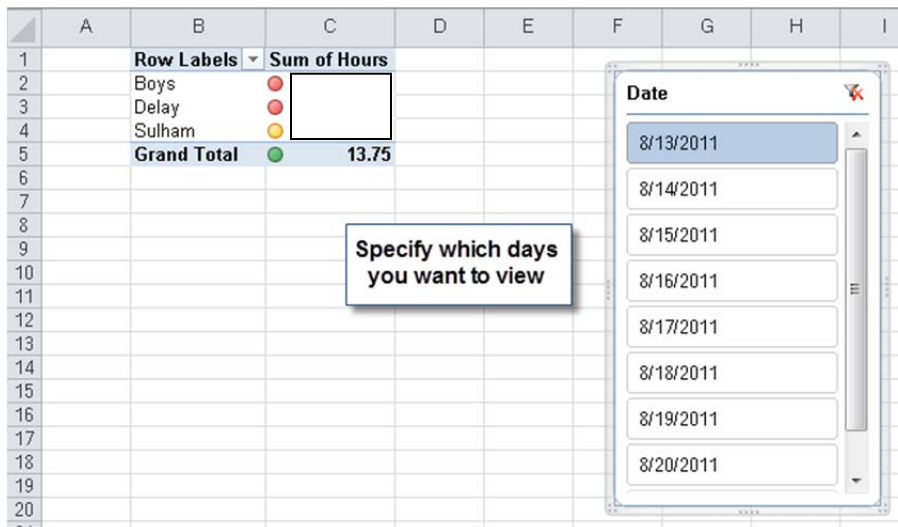
4. After closing the PowerPivot spreadsheet, navigate to the bottom of the spreadsheet and select the report sheet you wish to view. In this case, the sheet is labeled "Hour report".



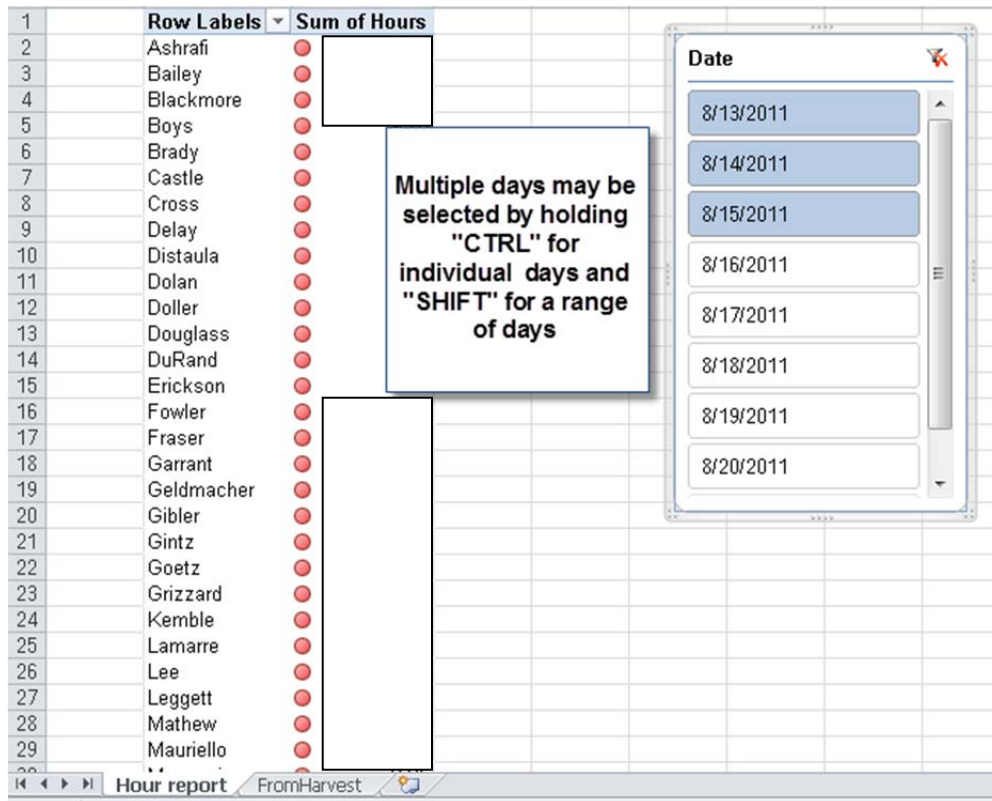
5. After selecting the appropriate report sheet to view, navigate to the top of the page and select the “Options” tab. Once selected, click the “Refresh” button.



6. After clicking “Refresh”, the report will reflect the data you had originally injected into the spreadsheet. Using the slicer you can now generate reports of this new data based on the particular time range you originally selected.



7. You can select individual or a range of options in the slicer to produce a report reflective of that period.



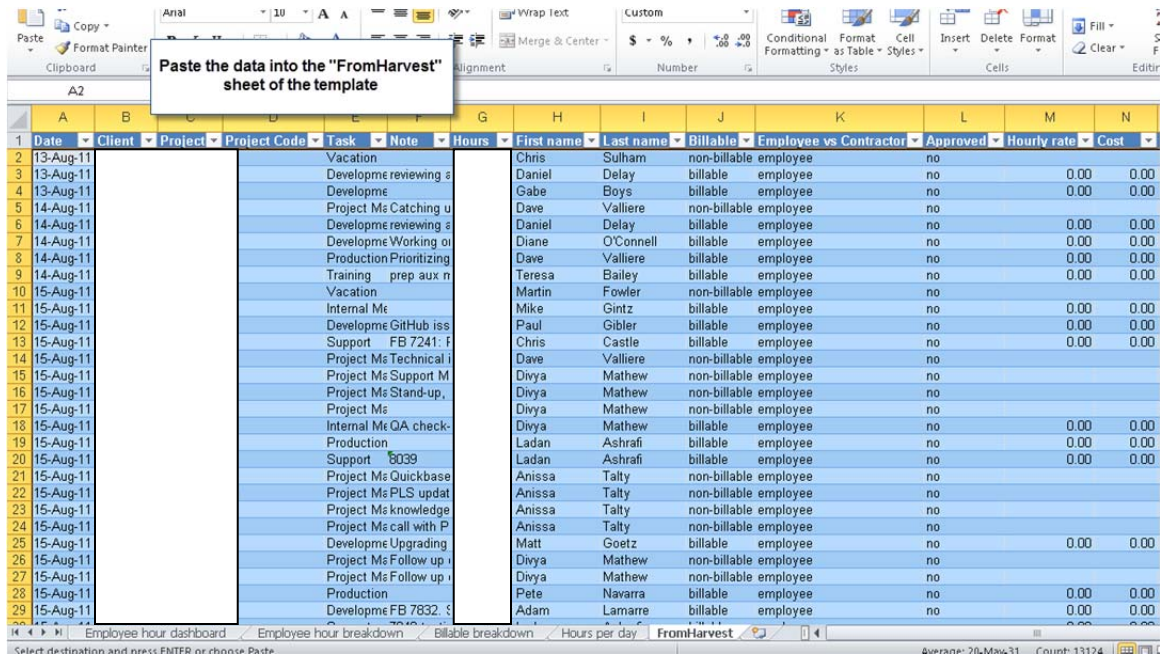
**8. With the appropriate time period selected your report will automatically update. You can save the finished report to an appropriate location on your hard drive or print the document.**

In the following report process tutorial, the initial steps to access the Harvest data are identical to the initial steps above. Due to the redundancy, those steps have been omitted and this guide will resume at pasting the data into the report template.

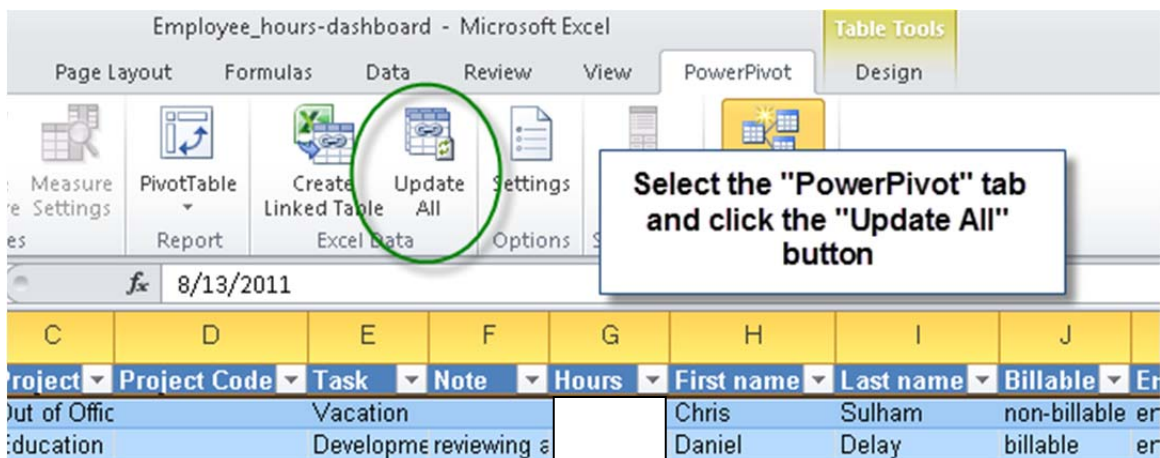


### 3. Updating a dashboard template

1. After copying the data in the imported spreadsheet from Harvest, paste the data into the "FromHarvest" sheet of the report template.

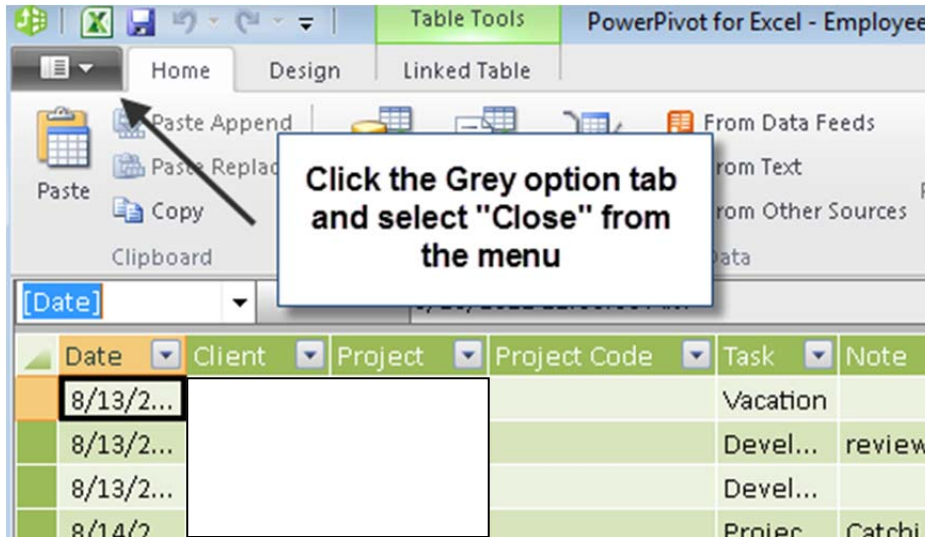


2. After replacing the data in the template with the data you wish to report on, navigate to the top of the spreadsheet and select the "PowerPivot" tab. After selecting "PowerPivot", click the "Update All" button.

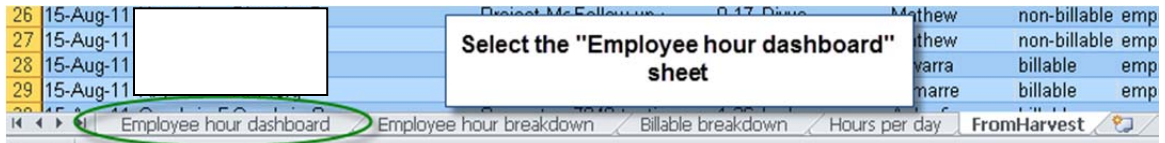


3. Once "Update All" is clicked, a new window with the PowerPivot data will appear on the screen. Close this window by clicking the grey options button in

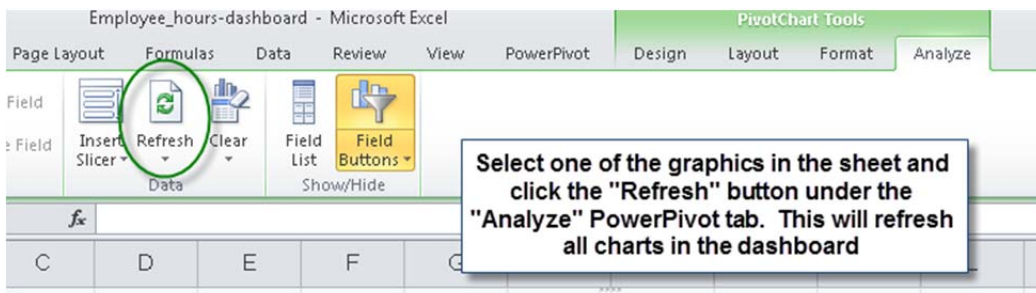
the upper-left portion of the screen and click “Close” from the drop-down menu.



4. After closing the PowerPivot window, select the “Employee hour dashboard” labeled sheet at the bottom of the spreadsheet.



5. Once the dashboard sheet is selected, select one of the graphs displayed and select the “Analyze” PowerPivot tab at the top of the screen. Once selected, click the “Refresh” button to refresh the charts to reflect the data you entered.



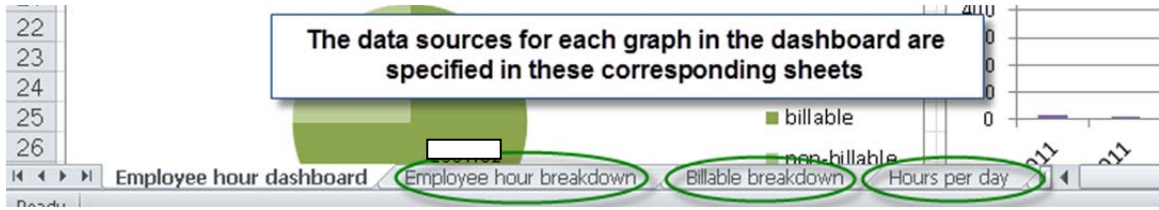
Employee hours per week



6. Once “Refresh” has been clicked, each chart will be updated and accurately reflect the information you inserted into the “FromHarvest” sheet. To view



the specific data which each chart displays, select any one of the corresponding sheets at the bottom of the page.



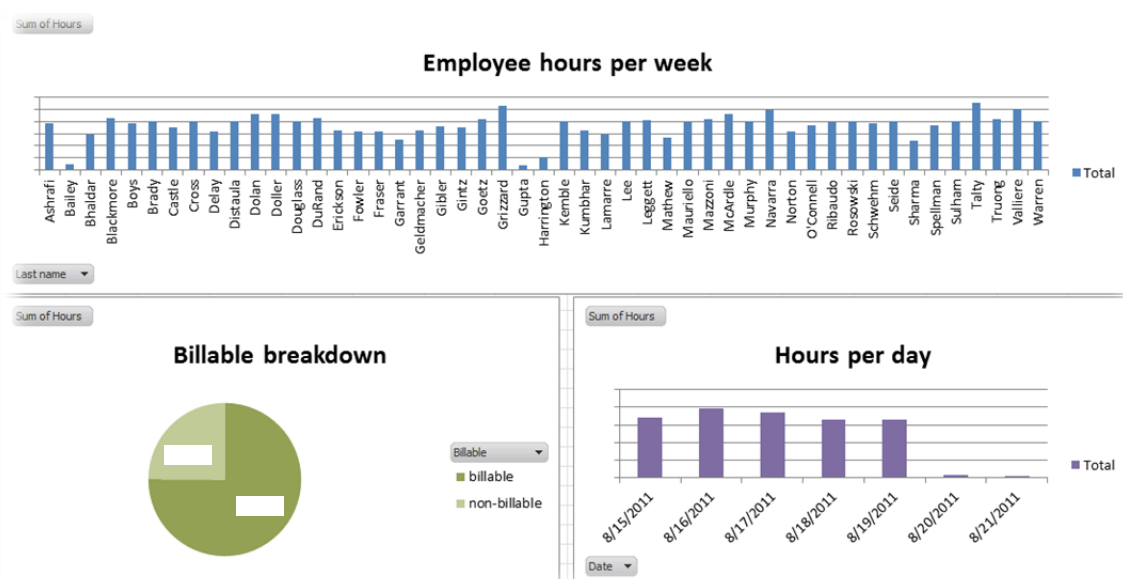
## 4. Report template descriptions

Below is a breakdown the Microsoft Excel PowerPivot report templates that have been created for use at Velir. These templates allow Velir managers to better interact with Harvest data. In the training manual there are step-by-step instructions for placing new data into the templates, as they will initially contain no data.

### Harvest PowerPivot templates

The Velir MQP group has created fourteen Excel PowerPivot report templates. These templates have been designed to provide better ways of interacting with Harvest data, and a considerable amount of time has been spent to replicate reports that are manually generated on a regular basis.

### Employee hours dashboard



The employee hours dashboard breaks down Velir employee and contractor time over the course of the Harvest data date range. There are three main graphs associated with this dashboard that provide a visual way of tracking hours which make anomalies very easy to spot. On the dashboard, going clockwise, the three graphs are Employee hours per week, Billable breakdown, and Hours per day. Employee hours per week represent the total number of hours Velir employees and contractors spent in the given Harvest data date range. Billable breakdown shows the distribution between billable and non-billable hours. Hours per day gives a breakdown of the total number of hours employees logged on a given day.

## Employee last name and hour total report

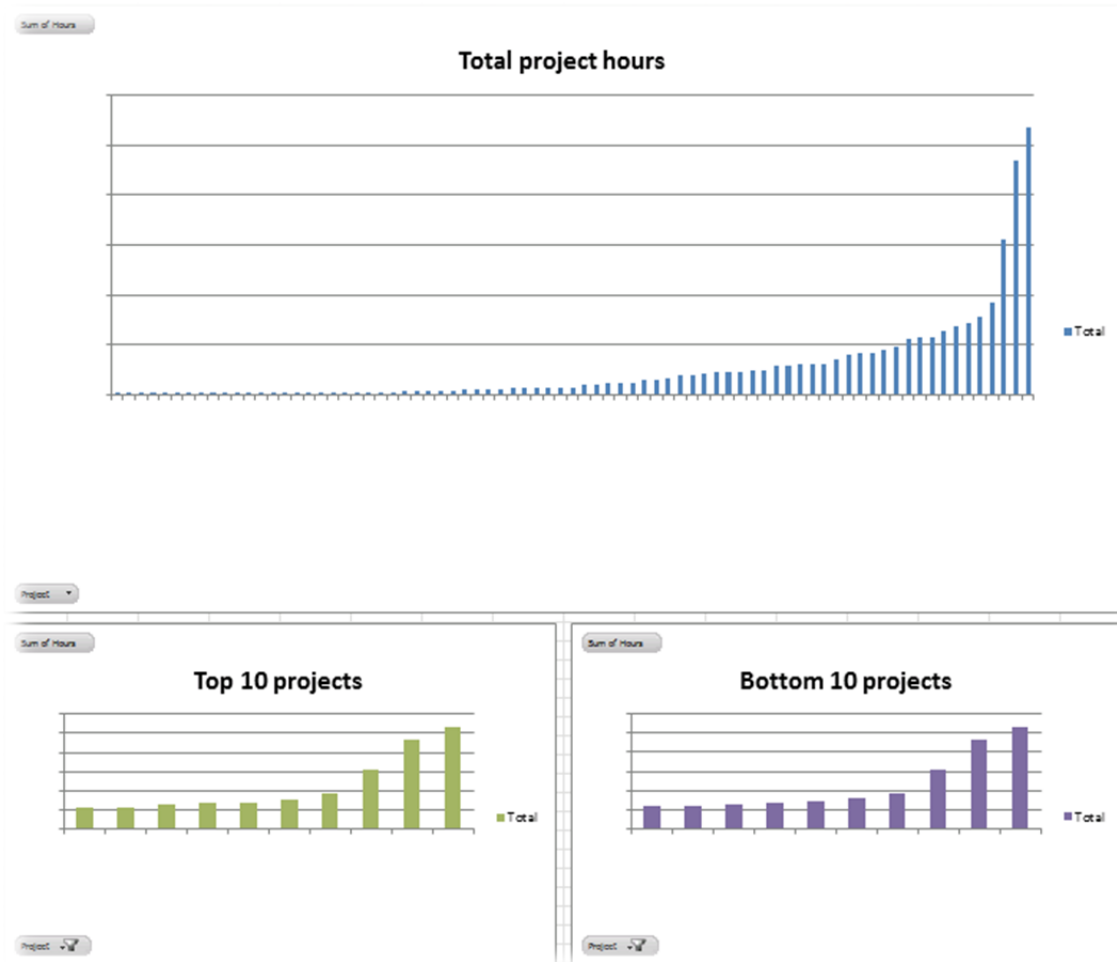
Row Labels	Sum of Hours
Talty	●
Grizzard	●
Valliere	●
Navarra	●
Doller	●
McArdle	●
Dolan	●
DuRand	●
Blackmore	●
Truong	●
Mazzoni	●
Goetz	●
Leggett	●
Brady	●
Douglass	●
Murphy	●
Rosowski	●
Lee	●
Seide	●
Sulham	●
Distaula	●
Cross	●
Warren	●
Kemble	●
Mauriello	●
Ribaudo	●
Ashraf	●

Date
8/15/2011
8/16/2011
8/17/2011
8/18/2011
8/19/2011
8/20/2011
8/21/2011

The employee last name and hour total report lists the last name of a Velir employee with the total number of hours they worked for a given Harvest data date range. The breakdown is sorted in alphabetical order by employee last name and includes customizable conditional formatting for specified range of hours.

## Hours per project dashboard



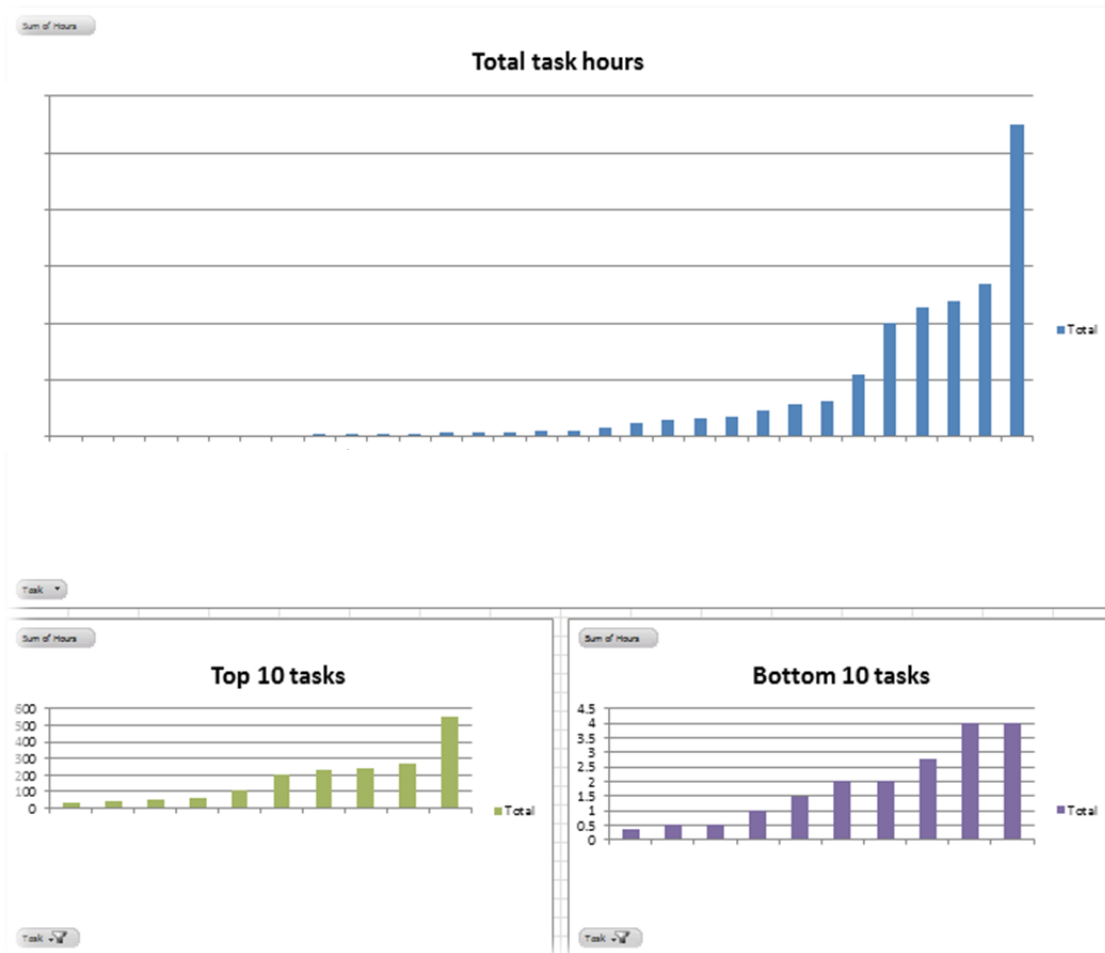
The hours per project dashboard breaks down Velir employee and contractor time over the course of the Harvest data date range, per project. There are three main graphs associated with this dashboard that provide a visual way of seeing what projects are consuming the most (and least) number of employee hours. On the dashboard, going clockwise, the three graphs are Total project hours, Top 10 projects, and Bottom 10 projects. Total project hours represent the number of hours spent on each project within the given Harvest data date range. Top 10 projects represent ten tasks that take the most time in the given Harvest data date range. Bottom 10 projects represent ten tasks that take the least time in the given Harvest data date range.

## Employee hours per project report

Project	Project C...	Date	Billable	Cost	Row Labels	Sum of Hours
	PI RADPAC RWJF-SRD	8/15/2011 8/16/2011 8/17/2011 8/18/2011 8/19/2011 8/20/2011 8/21/2011 8/22/2011	billable non-billable	0	8/15/2011 <ul style="list-style-type: none"><li>Business Development<ul style="list-style-type: none"><li>Mathew</li></ul></li><li>Deployment<ul style="list-style-type: none"><li>Leggett</li></ul></li><li>Design<ul style="list-style-type: none"><li>Goetz</li></ul></li><li>Development<ul style="list-style-type: none"><li>Boys</li><li>Delay</li><li>Distaula</li><li>Erickson</li><li>Geldmacher</li><li>Gibler</li><li>Goetz</li><li>Grizzard</li><li>Lamarre</li><li>Leggett</li><li>Mazzoni</li><li>O'Connell</li><li>Schwehm</li><li>Sulham</li><li>Truong</li></ul></li><li>Discovery</li></ul>	

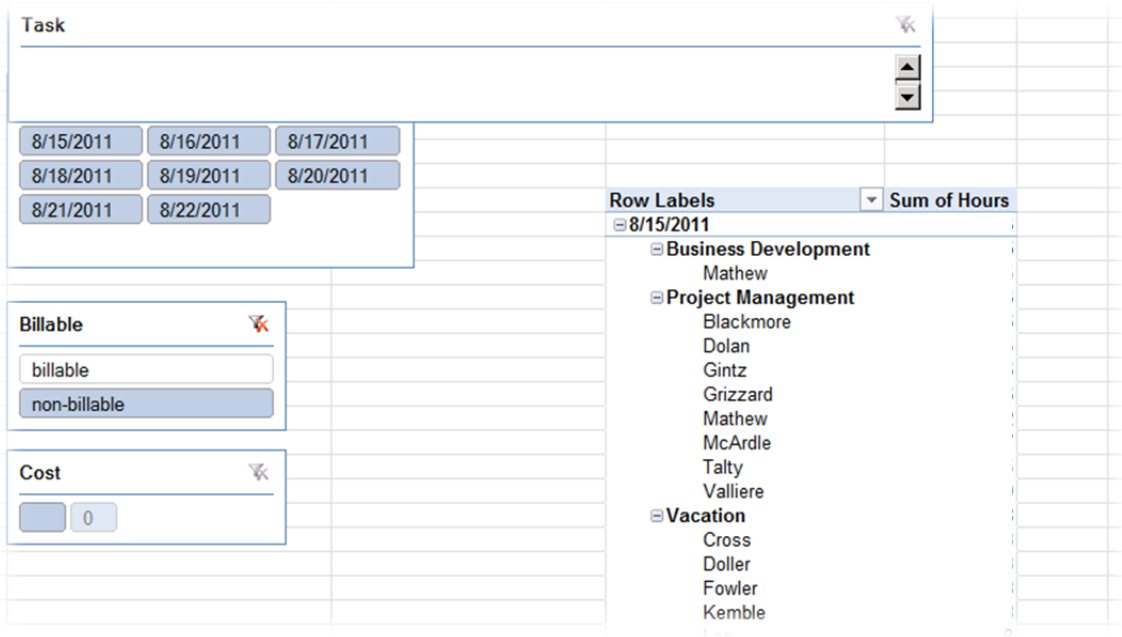
The Employee hours per project report lists the projects total hours, per employee, per date. The report has slicers which allow for the manipulation of the data based on specific projects, project codes, dates, billable hour types, and costs. All of these items can be adjusted on the fly, from the slicer, and the report will be automatically updated as adjustments to the slicers are made.

## Hours per task dashboard



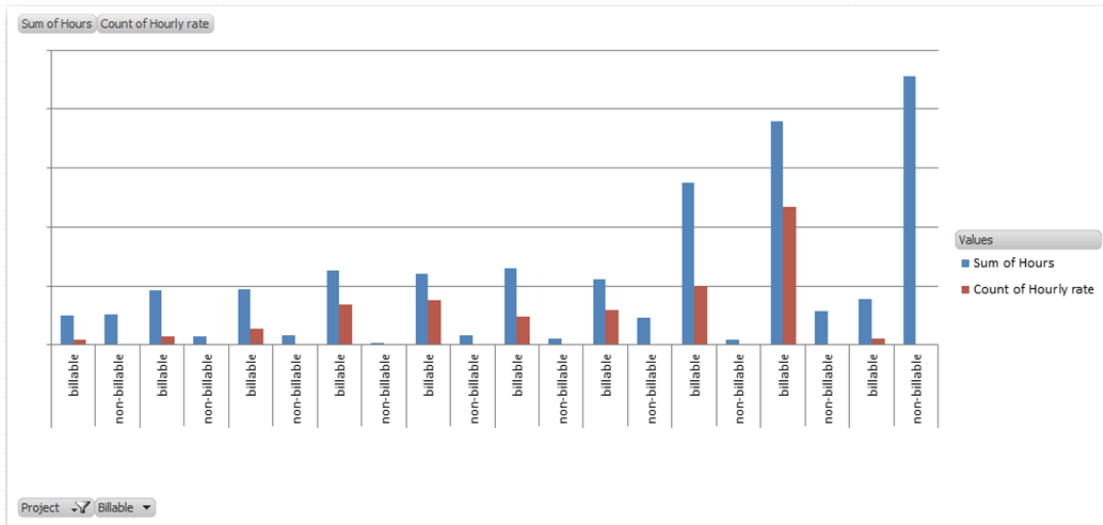
The hours per task dashboard breaks down Velir employee and contractor time over the course of the Harvest data date range, per task. There are three main graphs associated with this dashboard that provide a visual way of seeing what tasks are consuming the most (and least) number of employee hours. On the dashboard, going clockwise, the three graphs are Total task hours, Top 10 tasks, and Bottom 10 projects. Total task hours represent the number of hours spent on each task within the given Harvest data date range. Top 10 tasks represent ten tasks that take the most time in the given Harvest data date range. Bottom 10 projects represent ten tasks that take the least time in the given Harvest data date range.

## Employee hours per task report



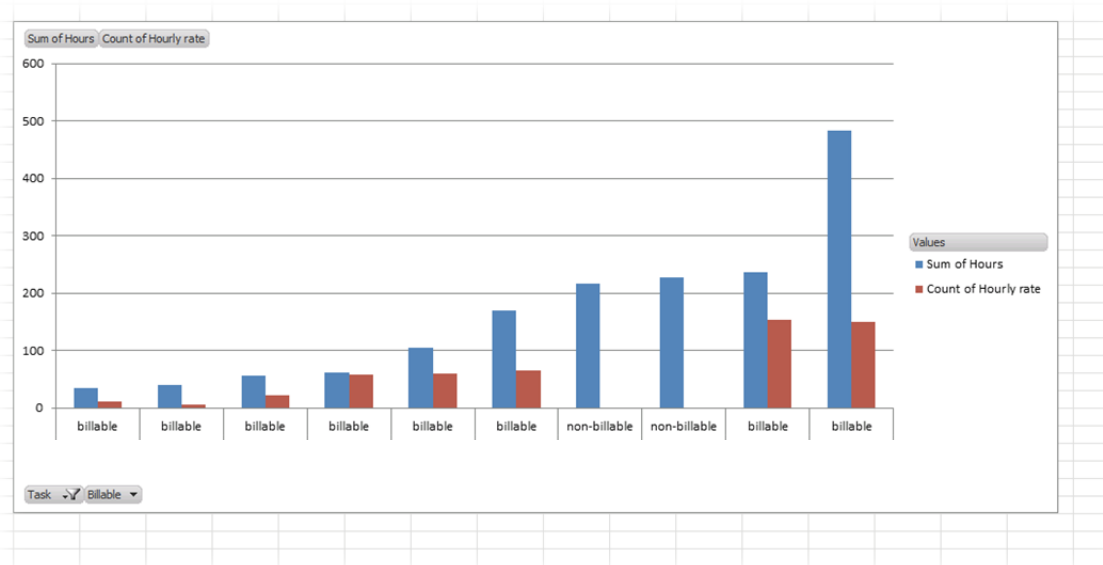
The Employee hours per task report lists the projects total hours, per employee, per date. The report has slicers which allow for the manipulation of the data based on specific projects, project codes, dates, billable hour types, and costs. All of these items can be adjusted on the fly, from the slicer, and the report will be automatically updated as adjustments to the slicers are made.

## Project employee hour and budget dashboard



The Project employee hour and budget dashboard breaks down Velir employee and contractor time over the course of the Harvest data date range, per project. There is one main graph associated with this dashboard that provides a visual representation of the top ten billable and non-billable hours for each project.

## Task employee hour and budget dashboard

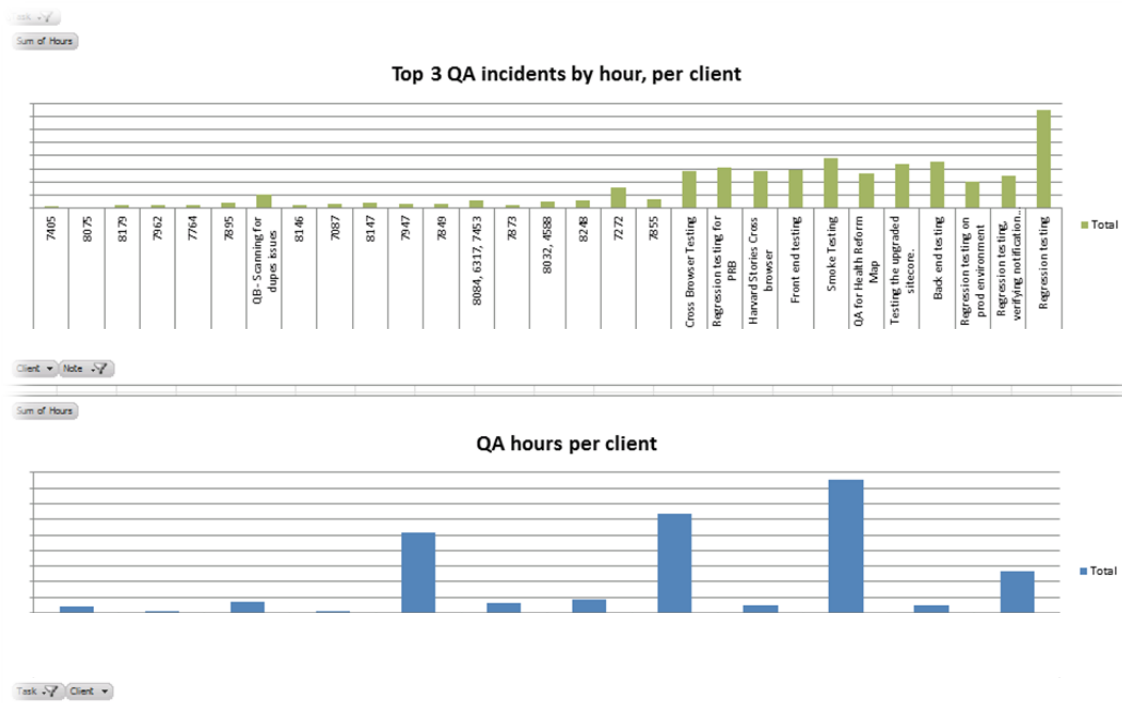


The Task employee hour and budget dashboard breaks down Velir employee and contractor time over the course of the Harvest data date range, per task. There is one main



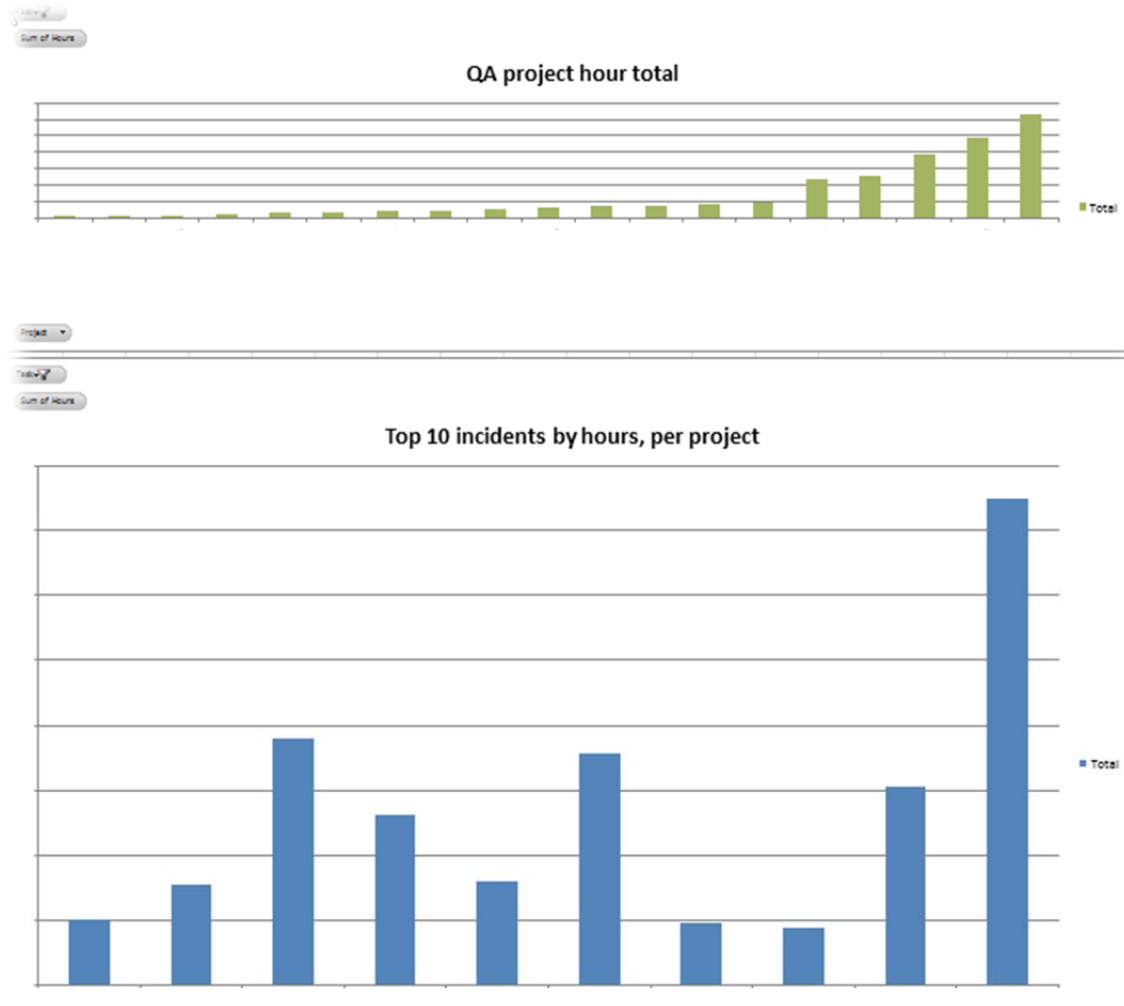
graph associated with this dashboard that provides a visual representation of the top ten billable and non-billable hours for each task.

### QA client incident dashboard



The QA client incident dashboard breaks down Velir employee and contractor time spent in QA over the course of the Harvest data date range, per client task. There are two main graphs associated with this dashboard that provide a visual method for seeing what QA incidents are consuming employee hours. On the dashboard, from top, there is the Top 3 QA incidents by hour, per client and below that QA hours per client. The Top 3 QA incidents by hour, per client show the top three time intensive QA incidents for the top ten clients. The QA hours per client graph show all clients and the total number of QA hours spent on each client within the Harvest data date range.

## QA project incident dashboard



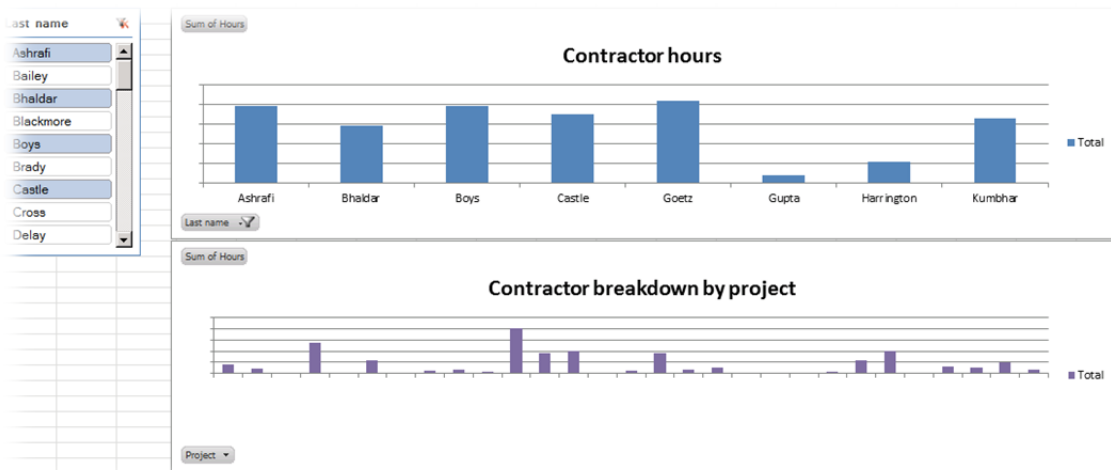
The QA project incident dashboard breaks down Velir employee and contractor time spent in QA over the course of the Harvest data date range, per project. There are two graphs associated with this dashboard that provide a visual method for seeing what QA incidents are consuming employee hours for a project. On the dashboard, from top, there is the QA project hour total and on the bottom, Top 10 incidents by hours, per project. The QA project hour total graph shows the projects ranked in ascending order by the number of hours spent within the Harvest data date range. The Top 10 incidents by hours, per project graph displays the top ten incidents that have consumed the most hours in the Harvest data date range in ascending order.

## QA full incident status report

Date	Client	Project	Project Code	Task	First name	Last name	Note	Approved	Hour	Cost	Sum of Hours
9/15/2011				QA	Dawn	Erickson	7405	no	0	0	
9/15/2011				QA	Dawn	Erickson	7405	no	0	0	Total
9/15/2011				QA	Dawn	Erickson	7405	no	Total		
9/15/2011				QA	Dawn	Erickson	7405 Total				
9/15/2011				QA	Dawn	Erickson	Total				
9/15/2011				QA	Dawn	Erickson	Total				
9/15/2011				Total							
9/15/2011											
9/15/2011				QA	Dawn	Erickson	Regression no		0	0	
9/15/2011				QA	Dawn	Erickson	Regression no		0	Total	
9/15/2011				QA	Dawn	Erickson	Regression no	Total			
9/15/2011				QA	Dawn	Erickson	Regression testing	Total			
9/15/2011				QA	Dawn	Erickson	Total				
9/15/2011				QA	Dawn	Erickson	Total				
9/15/2011				Total							
9/15/2011				Total							
9/15/2011				QA	Dawn	Erickson	7849	no	0	0	

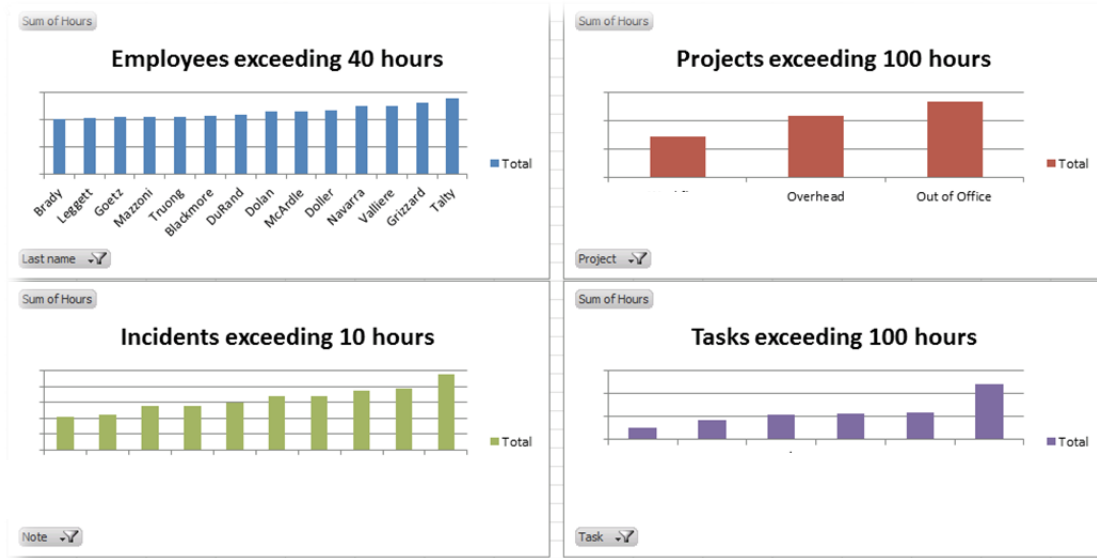
The QA full incident status report lists all projects that have logged time with the QA department. The report lists the date, client, project, project code, task, first name, last name, note, approval status, hour total, cost, and sum of hours. The report is able to be sorted by any field and each field can be collapsed and expanded as necessary. This report was directly modeled after an existing Excel template for QA incident status that requires manual sorting and manual data entry.

## Contractor hour dashboard



The Contractor hour dashboard breaks down Velir contractor logged within the Harvest time data range. There are two main graphs; on the top Contractor hours and on the bottom Contractor breakdown by project. There is also one slicer to the left hand side of the graphs for Employee last name (currently there is no contractor or employee designator in Harvest). In the Contractor hours graph, the total number of hours logged into Harvest for the given data date range is displayed (this data is also dependent on the slicer selection).

## Problematic dashboard



The Problematic dashboard breaks down Velir employee and contractor time spent over the course of the Harvest data date range. There are four graphs associated with this dashboard that provide a visual method for seeing potential problems within the Velir time tracking data range. The four graphs that appear, clockwise, are Employees exceeding 40 hours, Projects exceeding 100 hours, Incidents exceeding 10 hours, and Tasks exceeding 100 hours. By the default numbers this dashboard is designed to be viewed on a weekly basis, but the numbers can easily be changed. Employees exceeding 40 hours is a graph of all Velir employees and contractors who have exceeded forty hours for a given Harvest time data date range. Projects exceeding 100 hours are all projects that have accumulated more than on hundred hours for the given Harvest time data date range. Incidents exceeding 10 hours shows all incidents which have more than ten hours logged to them in a given Harvest time data date range. Finally Tasks exceeding 100 hours display the tasks which have, in the given Harvest time data date range, gone over 100 hours.

## Department hour dashboard



The Department hour dashboard breaks down Velir employee and contractor time spent by department. There are three graphs associated with this dashboard that provide a visual method for seeing the breakdown of time spent per department within the Velir time tracking data range. The three graphs that appear, clockwise, are Hour breakdown by department, Top project by department, per hour, and Top task by department, per hour. Hour breakdown by department provides the total employee hour breakdown for each department within the Velir time tracking data range in ascending order. Top project by department shows the project which has consumed the most time for the Velir time tracking data range in ascending order. Finally, Top task by department, per hour shows in ascending order the top task within each department per hour spent within the Velir time tracking data range.

These report templates can be customized and combined to follow a more specific workflow or to satisfy the desire for specific information. Due to the vast amount of customization available in Excel and the PowerPivot add-in, the possibilities for further customizations or additions to these templates (or any new templates) are very large.

## 5. FAQ

*What is the point to the Excel PowerPivot templates?*

The Excel PowerPivot templates are examples of work that can get done with the PowerPivot add-in. Based on the Velir MQP research, our report templates are replications of requested features or existing reports that are generated manually.

*What is the point of the Ruby scripts?*

The Ruby scripts represent a Velir MQP team effort of creating a seamless method for generating Excel reports automatically. The Ruby scripts downloaded data from Harvest, sorted through the data for specified information, and output a formatted Excel XML file. Note: Development on these scripts were stopped prematurely based feedback received from project managers at Velir.

*What is the point of the Harvest Excel add-in?*

The Harvest Excel add-in allows users to click one button and have updated data from Harvest inserted into a specified sheet. Due to limitations with interaction with PowerPivot, this tool remains in beta. In the future, when or if Microsoft releases an API for PowerPivot this add-in should be reviewed.

*Why do you have to Update and Refresh each report template with the addition of new data?*

Since PowerPivot treats data differently than Excel does, the data actually resides in two different locations at all times. To maintain normal Excel functionality, PowerPivot imports data to its database and leaves data in Excel untouched. Unfortunately if data changes in the Excel data table, it must be changed in PowerPivot in order to have any referencing data. At this time there is no automatic method for keeping data up to date at all times, unless the data is stored on an external database server.

*I have replaced old data but the tables or graphs still reflect old data. Help!*

You probably have not refreshed the PowerPivot table or graph. Under the PowerPivot ribbon menu, select options (for a table) or analyze (for a graph) and click on the “Refresh” button.

*Why can't more of this process be automated?*

Due to the lack of API provided by Microsoft, developers have a relatively limited number of methods to interact with PowerPivot—none of which are actually sanctioned by Microsoft and may at any time break. Until an API is released there are not many options to assist with automation in PowerPivot based reports.

Another significant hurdle is the lack of XLS export functionality in the Harvest API. Harvest does not provide a method for downloading report data in an XLS format other than the

button on their website. This adds a significant hurdle to the creation of a fully automated system and places reliance on scripting methods which are prone to breaking with any change in the Harvest website.



## **6. Conclusion**

This concludes the tutorial for generating two basic reports using data imported from Harvest, detailed description about each report, and the Frequently Asked Questions (FAQ) section. Between these three main sections, the process for using report templates should be thoroughly familiar.



## Velir Project Tracking System Major Qualifying Project (MQP)

Matthew Dodd  
James Ham  
Alexandria Haney  
James Post

Worcester Polytechnic Institute



## Agenda



- Problem identification
- Methodology
- Proposed design
- Final design
- Implementation
- Conclusion
- Reflection
- Questions

Worcester Polytechnic Institute

- Report generation process for employee time tracking is inefficient

10-Aug-11	Project M/calls, eme	Mike Gertz	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Internal M/	Mike Gertz	billable	employee	no	0.00	0.00		Project M/United Sta 5
10-Aug-11	Development/GRHub/oa	Paul Carter	billable	employee	no	0.00	0.00		Development/United Sta 5
10-Aug-11	Support PB 7241 f	Chris Casella	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Project M/Technical i	Dave Valliere	non-billable	employee	no				United Sta 5
10-Aug-11	Project M/Support M	Chris Mathew	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/Stand-up	Chris Mathew	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/	Chris Mathew	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Internal M/GA check	Chris Mathew	billable	employee	no	0.00	0.00		Project M/United Sta 5
10-Aug-11	Production	Ladain Aivraff	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Support 9039	Ladain Aivraff	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Project M/Quickbase	Anissa Tally	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/PLS update	Anissa Tally	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/knowledge	Anissa Tally	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/call with P	Anissa Tally	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Development/Upgrading	Matt Gertz	billable	employee	no	0.00	0.00		Development/United Sta 5
10-Aug-11	Project M/Follow up -	Chris Mathew	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Project M/Follow up -	Chris Mathew	non-billable	employee	no				Project M/United Sta 5
10-Aug-11	Production	Fate Nwanna	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Development/PB 7932 ?	Adrian Laramie	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Support 7869 note	Ladain Aivraff	billable	employee	no	0.00	0.00		Production/United Sta 5
10-Aug-11	Development/FAT/acc i	Diane O'Connell	billable	employee	no	0.00	0.00		Development/United Sta 5
10-Aug-11	Operations/Payscale	Dave Valliere	billable	employee	no	0.00	0.00		United Sta 5

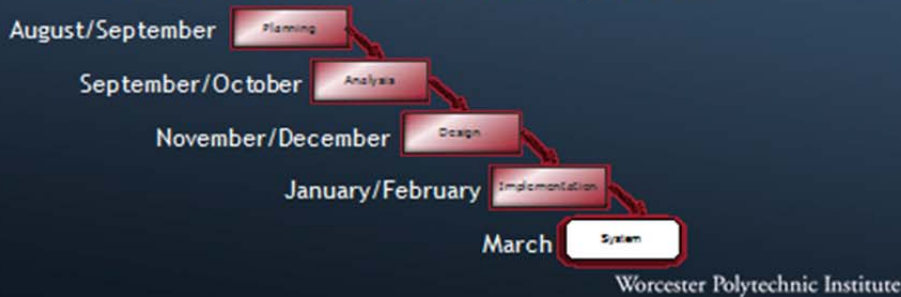
- Time is being wasted with something that could be automated

Worcester Polytechnic Institute

- Analyze and understand the existing processes surrounding the time tracking data
- Look at areas that could be improved by better use of available tools
  - Harvest
  - Excel
- Find and implement a solution to these issues

Worcester Polytechnic Institute

- Followed the SDLC (Systems Development Life Cycle) method
- Choose the Waterfall method in order to fit best with the MQP process



- Getting acquainted with Velir and the internal workflows
  - On site every Wednesday
  - Worked with our liaison, Tiven
- Set up our weekly advisor meeting
- Uncovering the true problem and planning for analysis



## Analysis phase: Interviews



- Help better understand the processes
- Gather important facts
- Standardized gathering of information
- Interact directly with employees generating the reports
- Get live demonstrations of workflow

Worcester Polytechnic Institute



## Analysis phase: Group research



- Set up development Harvest and FogBugz environments
  - Populated with production Velir data
- Learned about Harvest and FogBugz
  - Online documentation
  - Webinars
- Experimented and tested
- Analyzed files sent by interviewees

Worcester Polytechnic Institute





## Analysis summary



Need	Description	Reasoning
Report Excel Template	The ability to have a preformatted report that is more detailed than the data dump from Harvest.	Save time generating reports and trimming the same data every week.
Notifications	Ability to track anomalies and alert designated people when applicable.	Help stay proactive instead of reactive to staffing issues that arise during a project.
Timesheet Tracking	Better manipulation and filtering for entered time.	Helps sort employees individually or by project to get a better understanding for what is going on.

Worcester Polytechnic Institute



## Analysis summary



Need	Description	Reasoning
Real Time Reporting	The ability to identify and react to projects staffing issues as they are happening.	Ability to track projects without compiling lots of data together.
Connect Harvest and FogBugz	Integration to create more accurate reporting for time spent on tickets.	Saves time in preparing reports and for tracking bugs during a project.
Invoicing	Better integration with QuickBooks or utilization of Harvest invoicing.	Saves time refining invoices in continually modeling invoices in the same way.
Timer Feature	Global hotkey for entering hours more accurately.	Helps encourage more accurate input of employee hours.

Worcester Polytechnic Institute



## Design phase



- Took the data and came to a conclusion on a viable solution
  - Stay within our project scope
  - Offer opportunities for future expansion
  - Focus our efforts on something that will be most effective
  - An issue that impacts everyone

Worcester Polytechnic Institute



## Proposed report preview



Last Name	Total October Hours	Hours/day
Norton		
Caplette		
Mathew		
Brady		
Dolan		
Navarra		
McArdle		
O'Connell		
Fraser		
Garrant		
Harrington		
Rubin		
Gupta		
Goetz		
DuRand		
Delay		
Mazzoni		
Leggett		
Distaula		
Murphy		

Worcester Polytechnic Institute



## Proposed design



- Improve the interface for exporting data from Harvest
- Allow for more customization while generating reports
- Automate formatting and other repetitive tasks
  - Utilize Harvest API and Excel XML formatting
- Received helpful feedback

Worcester Polytechnic Institute



## Revised design



Based on feedback:

- Create a better workflow for creating reports from Harvest data
  - Focus on Excel and PowerPivot
- Optimize the report generation workflow
  - Utilize Excel PowerPivot add-on
- Create an Excel add-in to assist with this process

Worcester Polytechnic Institute






Worcester Polytechnic Institute




- Estimated time spent creating each report from interviews
- Weekly savings estimated at \$1100
- Return on investment of 428% in the first year

Employee Wage  $\times$  Report Creation Time  $\times$  Year

Worcester Polytechnic Institute

- 
- Worked to create a solution which integrates well to current workflow
    - But offers a number of improvements
  - Easier to adjust and adapt reports
    - Can create even more powerful reports
  - More visual
    - Dashboard like interfaces
  - Room for future expansion
    - VSTO and SharePoint

- 
- Created documentation for PowerPivot
    - Install procedure and general troubleshooting
    - Integration into existing workflow
  - Fully documented our report templates
    - How to utilize these reports
  - Fully documented code
    - Ruby scripts and C# Excel add-in



# Implementation demo



Worcester Polytechnic Institute



# Implementation conclusion



- Creation of documentation
  - Printed manual
  - CD with all files in digital format
- Creation of interactive training
  - Camtasia presentation and walkthrough
- Plans and ideas for future expansion of our system

Worcester Polytechnic Institute



## Conclusion



- Gathered data on the Harvest usage within Velir
- Identified a target improvement
  - Cost savings of \$1100 per week
- Created Excel report templates
- Laid groundwork for fully automated system
- Created documentation and tutorials for internal implementation
- Final project delivery
  - Friday March 2<sup>nd</sup>

Worcester Polytechnic Institute



## Questions or comments



Any questions or comments?

Contact us at [mismqp@wpi.edu](mailto:mismqp@wpi.edu)

Worcester Polytechnic Institute



Thanks



Thank you for all your help throughout  
this MQP project!

Worcester Polytechnic Institute