

Project Management Implementation by Administrative Assistant Management Help

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Abstract — *Administration Assistant Management System is a web based solution to manage tasks. With the purpose to be easy to use, require minimal training and for the use of any office tasks. Utilizing concepts from the project management institute like work breakdown structure and time management. It was built using Zurb Foundation and ASP.net to for personal computer and mobile device use. It allows for user management and task management including audio tasks. Sends notifications and monitors the target server installation.*

Key Terms — *ASP Custom Control, Project Management, Office Automation, Visual Basic.*

INTRODUCTION

In our work life it is expected we manage our time. There can be more things to do than we can manage in a single day. When those tasks are dependent upon others and others dependent on our tasks then we need project management. Using project management software can help others know our current workload, what is on schedule and what is on budget.

At first we manage our tasks using our heads or writing them on paper. Then office automation came and we started using Microsoft Excel and Project. Their problem is they are subjective to each individual and they are not visible to management. It is easier for them to get lost among other set of documents.

There is software as a service (SaaS) like OnTime where you pay a monthly fee per usage tier to hold all your tasks. This is cheaper than a corporate solution but you will need to budget this expense every month [1]. You will need to read the security policies on your data and have periodic backups for safekeeping [2]. Not every vendor discloses this kind of information and its important

for your customers. The benefit is that you do not require any technical expertise, hardware or personnel to set them up and keep maintenance.

There are corporate grade solutions like Altiris or IBM Tivoli. The problem with these applications is that they require extensive training and may not provide the mechanism to inter operate with other applications. In this environment usually there is a help desk, a software development department, new product projects, among others. It is difficult to keep updated when you have IT staff like software developers that may receive tasks from all of them.

PROJECT MANAGEMENT

The Project Management Institute (PMI) is an organization created to help and promote project management. It exists since 1984, since then there are five versions of their Project Management Book of Knowledge (PMBOK) manual. It instructs on how to plan a project until it is closed even explaining how to consider contracts.

PMI defines a project as a temporary effort with a start and an end to create a product, a service, or result [3]. It works with three constraints: schedule, scope, and budget. The mix of these three defines the quality of a project. Each is called time management, scope management, cost management and quality management. Each of these actions must be planned first or as early as possible with the help of stakeholders like who commissioned or sponsored the task and who is performing the task.

As shown in Figure 1 each process is initiated by management. This starts a plan and do cycle in the planning and executing processes. The monitoring and controlling process group perform checks interacting with all other groups. When the actions is executed and finished then the closing process group ends them [4].

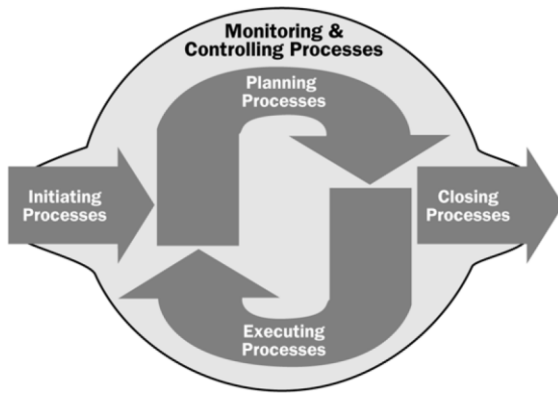


Figure 1
PMI Project Management Process Groups Mapped to the Plan-Do-Check-Cycle

For these actions there are many processes and protocols to follow in order to fill the needed documentation. For example for time management to happen, first the tasks to perform must be defined by levels of detail in a document called the work breakdown structure. To a detail where it is best to define progress in the project and then make the list of tasks that are in the critical path.

There are tasks that may affect a projects schedule like an incident where something crashed in the productive environment and it needs the same person who is doing a critical task. It will affect your schedule.

There is an emphasis on communication management where stakeholders receive the information they need at the interval they will need it. Like all other management it must be planned and allows people to know if a project is on schedule or not and if there is something needed for the continuation of the project.

The proposed solution will not perform all tasks or reports defined by PMI. It will help smaller organizations understand some of the concepts and help them if they will consider a more complex solution.

BACKGROUND

When we use project management software to manage tasks and projects we are performing office automation. Office automation is the act of mechanizing manual actions [5]. Like a

photocopier, a word processor, an image processor, among others.

To implement office automation it must be for the benefit of the organization. It must save time or money. This action causes resistance. Most commonly known as resistance to change. Resistance to change can be caused because people do not know why project management is necessary, they feel it will hinder their performance, or they feel it will cause them to be fired [6].

This can be offset by anticipating this resistance, explaining to people why the change is necessary and allowing them to be express their concerns. The technology acceptance model (TAM) (Figure 2) is defined by perceived usefulness and by perceived ease-of-use. Reference [7] explains perceived usefulness as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease-of-use as the degree to which a person believes that using a particular system would be free from effort. If users do not see these characteristics they will have less desire to use the system.

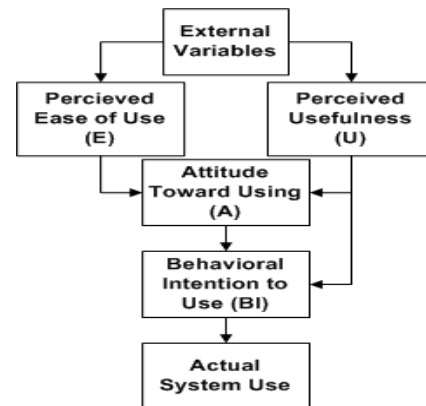


Figure 2
Technology Acceptance Model

Reference [8] explains how to evaluate an office system. You have to consider three questions. Where are the problems? How much time is spent on administrative tasks? What tasks do not generate profits?

Questions to ask considering the previous. Does the project management system or tool help the organization? Do users know how to use it? How much time is spent by non-project

management savvy stakeholders on the system? How quickly can they find the information they need? Do they know if the project is on track?

These tasks may generate value to the organization but maybe not to the individual. For a software developer performing tasks for software management may procedure more value than spending time with a project management system. The faster he can write status updates, comments and other information that is needed the better.

SOFTWARE ARCHITECTURE

The proposed solution is to help small and medium businesses where there is no dedicated project manager and the people performing the tasks are the ones managing the system. There may not be a dedicated information technology staff either. It is hoped it works as a learning tool for more complex systems that may appear in the organizations lifespan.

Application is built using Microsoft Net technologies and the MySQL community edition database. Web components with ASP.net with all components using Visual Basic.net.

The software solution uses a 3 layered architecture. The interface, the business logic and the data layer. The purpose to be able to do changes without necessarily having to change all other components.

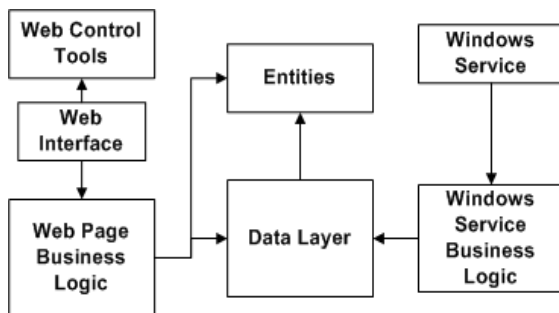


Figure 3
Solution Components

As shown in Figure 3 it contains a web interface to be used inside and outside the organization. With capability to be used in mobile devices like a tablet or a smart phone. The background process is to perform maintenance tasks independent of the user.

Entities have the definition of classes like the tasks, task relationships, users, departments, among others. They will store each object for the ease of communication between the web browser and the web server. The business logic contains the actions performed in the system for the different entities.

Data is stored in a MySQL community edition database. It allows more concurrent connections than other options like MSSQL, PostgreSQL. It is accessed and manipulated by data layer set of classes.

METHODOLOGY

The user's first experience with the website will be when they log on to the company intranet server. It could also be installed in a hosting server that allows for the install of window service applications.

The user can log on with their PC and or their mobile device using the web browser. User will have access if an administrator created his account and if they didn't try too many times. It will show the appropriate message so the user can ask the web site administrator what he needs to do.

Once logged-in depending on the access level is what is shown. If it's a normal user they can create and manipulate tasks. A supervisor can assign tasks to their team. An administrator can create users, change the system configuration and monitor the results of the background windows service.

Each page is to hold help videos on their usage. Like how to create a task, how to close a task, how to monitor the system performance and so on. This will help teach users how to use the system by showing instead of telling. It can be considered the addition of in place tutorials like Google and Facebook do whenever there is a new change in their systems.

In software development tasks can be divided into features, bug solving and maintenance. In PMI these tasks are called activities. Users of this application are not expected to know this terminology being able to create basic tasks only.

An audio task is for when a user has little time to create a task or is on the go. It requires an audio

recording and a task title. Once saved this task will be taken to a transcribing queue where another user can hear the recording and convert it to an advanced task.

A basic task a user can enter the title and description of what they need. Including files if they have them. Helping the persons who will do the task know better of their needs.

An advanced task is where a worker or a supervisor can fill the data they know. Like who will be assigned to the task. In what status is the task. If its part of a project and how much time and cost will it be to perform the task. In most if not all project management methodologies time to complete must be estimated. This can be compared to how much time it took to realize the task and estimate better next time. Cost can be used to compare against the budget. Assigned task and owner are used to communicate stakeholders of changes.

Administration pages are to perform and know of the technical maintenance for the application they will handle the creation of users, if they are enabled and their access level. It contains a page to configure the email used to send notification confirmation. It can use an internal SMTP server or an external service like Gmail. There are pages to change the parameters of automatic processes contained in the background application. You can monitor the results of their executions like how much hard drive space is in the server and if there is Internet access. The configuration pages contain what you need to change and how.

CUSTOM CONTROLS

An ASP.net control are the objects you see in web pages. Like text boxes where you input your user name, to tables where you list lists of data, reports, etc. When the programming in integrated development environments (IDE) we see the object as a drawing and it will change a web sites language called HTML. The problem with navigation controls like menus and navigation bars is that they are represented as HTML tables. Many CSS frameworks do not handle this situation assuming they are tables to show data displaying

them wrong. Zurb foundation in particular requires the use of ordered and unordered lists to build these components.

ASP.net provides the way for you to create your own custom controls. How it works is that you define the object as a subclass of a control. Then you define the properties you wish to save or maintain by using the view state.

Web page communication between client and server is stateless; information is not stored for continued communication. There are two ways to handle this. If you are only needed to keep information on the server you save it to a session variable that is attached to a communication id between client and server. The other is a view state, this is information that is saved in encrypted format. When you see the source code of an ASP.net web page that was consumed you can see a string of letters and numbers at the start of the document. This is the data saved in the clients browser to post back the next time they call the server.

Control properties are stored in the view state to be used on following post back. Every time the page is rendered it will read this information and decide how to build the control's HTML representation.

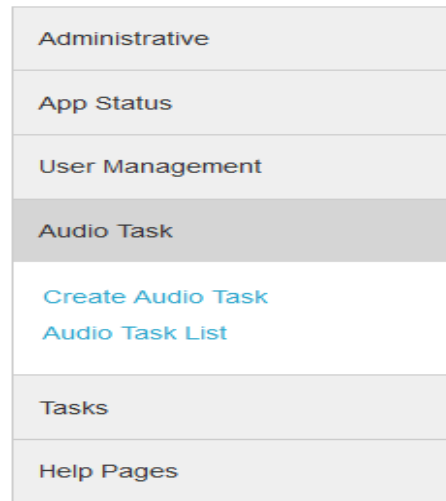


Figure 4
ASP.Net Menu Custom Control

The difficulty is when debugging you will need to go back and forth between the project and the class code. The benefit you can reuse the control in

any other projects where you need the same functionality.

The solution uses a few custom controls of note is the navigator (Figure 4) built using lists and then applying the Zurb Foundation framework. It allows to add and eliminate entries at run time and define what users can see for their access level. Another one is the control to play audio. For the moment it only shows the web browsers registered player, it is desired to use Flowplayer in the future.

ZURB FOUNDATION FRAMEWORK

A web page design is composed of three things: Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) and client-side code. HTML defines the web page components, CSS defines how the web page looks. Client-side code like javascript and vbscript for performing client side actions in the users browser.

Tables were used to design web pages for its easy way of defining what is a header, the body and a navigation bar. The problem they have is they add extra markup making it difficult for CSS design and they are static. CSS allows for more lean and dynamic ways of building the same.

Foundation uses a CSS style called "Grid". It is like the table where you define cells but these are not attached to a parent component like the table. It uses JavaScript, CSS and Saas, a css pre-processor, to move the components for device that is accessing the web page.

It was decided to use this component because Gartner expects an increase in mobile devices versus personal computers. As shown in Table 1 they expect in 2013 an increase of seven percent in device shipments [9]. The Zurb framework promotes the definition of the web page from a mobile device then test it in a personal computer. This solution was built the other way around. The use of the framework allows for development time to be lower as there is only one definition or set of pages for both types of devices.

Table 1
Gartner Worldwide Device Shipments by Segment Forecast
(Thousand of Units)

Device Type	2012	2013	2014
PC (Desk-Based and Notebook)	341,263	315,229	302,315
Ultramobile	9,822	23,592	38,687
Tablet	116,113	197,202	265,731
Mobile Phone	1,746,176	1,875,774	1,949,722
Total	2,213,373	2,411,796	2,556,455

AUDIO CAPTURE

An audio task allows a user to save audio for a task to be later transcribed. There is the question of how do we record the audio. Web pages in are static content. Server sends content and the browser consumes it. There is no direct connection between page and browser until another request is made. You need to use other technologies if you wish to record audio from the client's computer.

The first option is to use a standard file upload where the user records the audio using applications like AudaCity or EasyRecorder. Then the user seeks the file and then loads it to the task.

Other options are using third-party functionality to record the audio. You can use Flash but it will not work on Apple devices. ActiveX would work only on Windows. There are third party applications but they did not have a demo so I could not test them. There is more work to be performed on this section. Maybe HTML5 can provide a new solution. This subject requires more research to find a solution that works on most devices and browsers.

BACKGROUND PROCESS

With the purpose to not need an IT technician on staff all the time a background process was create to give maintenance to the system. It is a windows service that handles different tasks. Each task will execute at different time intervals and configurable from the web page.

The cleanup monitor will check for files and data that is old and not being used. The web page stores the files uploaded in a temporary folder until

they are submitted to a task number. This process will delete the files that have spent a time amount without being applied to any task. Also it will data tables like notifications or error logs where it is not of interest to have a history after a certain amount of time.

The health process will check if the server has internet access and how much disk space is left. It will check for internet access so the notification process can know if there is service to send emails, if not it will wait until there is service to send queued emails. Hard disk space is to help the administrator if the server will become full with task file uploads.

The notification process will send email notifications whenever a task is changed and keep trying until it can do it or the time to try has expired.

INSTALLATION

The objective is for the application to be as easy to install as possible. Nullsoft Scriptable Installation System (NSIS) will be used to build the setups.

Visual Studio setups allow for the installation of web pages and applications but it doesn't easily allow for the creation of question pages where one can ask the user for more information or perform additional pre-installation checks. If you do desire to do this, you will need to define custom installation instructions that allow for certain actions like registering a windows service. Other tasks are not so easy like adding a custom page and save the control results.

NSIS is a scriptable file like a programming file where one can define things like initialization checks, files to copy, command lines to execute, among others. For example in Windows 7 onwards if one wishes to add a web page you can execute the command "appcmd" using the command "ShellExecute" and NSIS allows us to receive and interpret the result. You can use it to verify .net frameworks installed by reading registry entries.

You can also define customer pages and sections using nsDialogs. Page's definition is different than any other programming language but

you can ask for field like where will MySQL installed at and the account to access it.

There would be two installation setups, one for the windows service and another for the web page. It is required for them to check the existence of MySQL or try to install if it doesn't exist. Then execute the script to add the needed tables and store procedures.

FUTURE WORK

There is still some work to be done to fulfill the objectives. It needs more work to be compliant with the Zurb Framework. The grid based system is confusing when working with many fields. Testing is missing for android and apple devices. Cleanup certain pages so they are easier to understand and use. Make new pages like bulk status update or bulk worker assignment improving the time spent on this application.

Improve how media is viewed. If a task has pictures attached allow for a picture gallery. If there are web enabled videos to show them using Flowplayer. Also allowing for audio clips to work as a play list. Maybe even converting media to web accepted formats in the windows service.

There is a need to automate application tests using tools like Selenium or Watir. Thus helping check the application is working faster.

A way to make the application data accessible through a web service so it can communicate with other task management software like a bug tracker.

Add reports to show the state of task, user workloads and project status. Make the installer as easy to use as possible. Using small .net console applications to register the web page in IIS, setting the database and the windows service.

Make tasks assigned to the user easier to use. Including a warning to not enter personal identifiable information of clients like social security and date of birth. Allow for automatic and manual backups.

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