A Study on Task Management System

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Abstract— **Every project or event involves series of tasks, activities, people, budget and deadlines. No matter how big or small the project is, the success or failure of the project depends on the execution plan and the order in which the tasks are fulfilled. It takes a great deal of skill to do this well, the time invested in building good project management techniques can pay off enormously and helps to achieve projects on time within the resource constraints. When one knows how to organize, schedule and delegate tasks it is an easy step for them to obtain the success of the project. This is where Eisenhower decision matrix comes in to the picture. Currently, there is no system or tool to organize the project related tasks and segregate it on priority. Task Matrix" helps teams to define the tasks using "Eisenhower matrix" and share it across easily. This proposed solution helps project management team and fellow team members to organize task effectively**

Keywords—Eisenhower decision matrix , Prioritization of tasks

I. INTRODUCTION

Whether these are bright ideas to pursue, exciting opportunities, or interesting possibilities, most of the people have many more activities on their "wish lists" than the time available to work on them. By choosing activities intelligently, they can make the very most of their time and opportunities. However, by choosing badly, they can bog themselves down in time-depleting, low-yield projects that stop us moving forwards. This is where a "Task Matrix" can be useful. This helps us to choose the activities we should prioritize and the ones we should avoid, if we want to make the most of our time and opportunities.

II. LITERATURE SURVEY

The essence of time management is to make the most amount of progress toward the goals with the least amount of effort. A key way to do that is to prioritize the tasks and projects that people work on individually and collectively as a team. When beginning the task of prioritization, one should have a clear grasp on the objective and the resources available (generally, time is the least scarce resource because it cannot be replaced or replenished).

Task matrix is useful when there are many actions and solutions and the options must be narrowed down and when the criteria for the outcome are agreed upon; but, there may be disagreement over the solution and also when the resources are limited. Task Matrix is based on the Eisenhower Method of arranging tasks by urgency and importance in a 2x2 matrix in which the key features or functions of the project deliverable are listed and prioritized according to their importance[8]. The goal is to gain general agreement as to which features should take priority over which other features if all work cannot be completed by the deadline. The finalized Task Matrix becomes an application for decision-making about which parts to focus on as the project unfolds.

Figure 1. Blueprint of task matrix

A. Benefits of Task Matrix

A Task matrix supports structured decision making in the following ways

- It helps to prioritize complex or unclear issues when there are multiple criteria for determining importance.
- It provides quick and easy, yet consistent method for evaluating options.
- It quantifies the decision with numeric rankings
- It is adaptable for many priority setting needs like projects, services, personal, etc.

- When used with a group of people, it facilitates reaching agreement on priorities and key issues.
- It establishes a platform for conversations about what is important

III. ARCHITECTURE OF THE TASK MANAGEMENT APPLICATION

The architecture diagram provides an overview of an entire system, identifying the main components that will be developed for the product and their interfaces. The overall architecture of Task Management Application is illustrated in the following figure. It consists of

a) Access Interfaces: The access interfaces are the consoles that allow you to manage the tasks. One can access the utility interfaces using web browsers.

b) Util-Console: util-console allows users to register, login and manage the tasks.

c) Application-Interface: Application-Interface consists of tomcat server environment which provides runtime environment to the application.

d) Service Layer: Service layer consists of user-management, task-management and admin-management related business logic.

e) Database: The database used is HSQLDB (Hyper SQL Database) used to store the data (records).
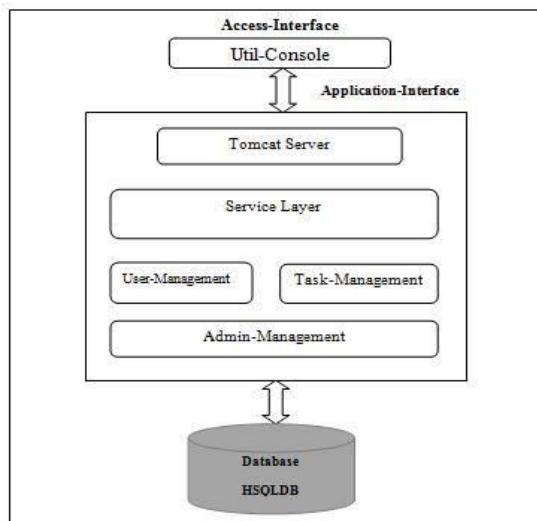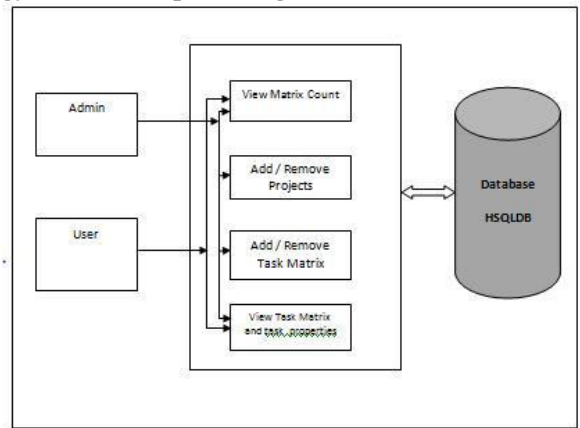

Overall Architecture of Task Management Application

Figure 3. Architecture of Task Management module of the Application

A. The construction of Task Matrix requires the following

a) A list of items to be prioritized

b) People to prioritize. (Works best if more than one person are involved; but, the more people involved in prioritizing, the longer it will take to prioritize the list.)

c) The criteria used to prioritize the list.

d) Rank the options under each criterion.

e) Assign an importance score for each option under each criterion.

f) Total the individual importance scores for each option.

g) Highest score becomes the top priority.
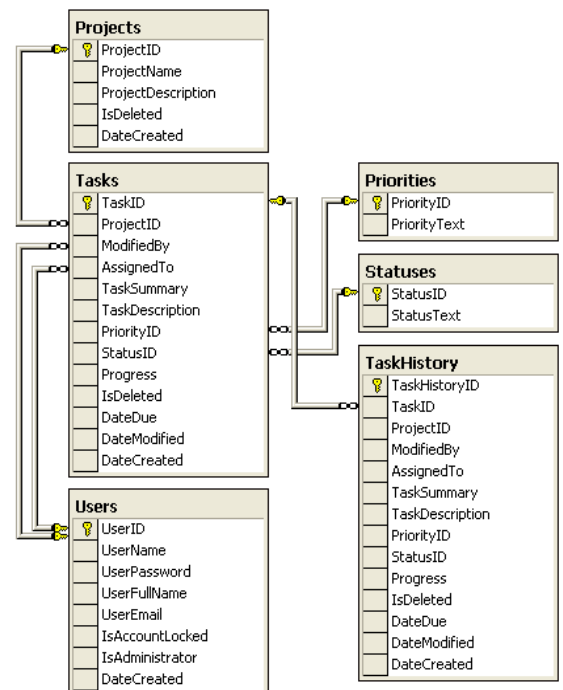
*Class Diagram of Task Management Application*

B. Prioritize the tasks

For prioritization to have any meaning, it's imperative to have a clear objective. The overall objective may be to achieve a decisive victory[1]. The role of prioritization is to help to achieve this result with as little effort as possible. The second consideration is the resources available. PersoFnal resources include time, money, social network, physical energy, and so on. Time is generally the scarcest resource because it cannot be replenished.In order to prioritize intelligently, a method is required that tells how to evaluate projects in terms of overall importance and also tells about which projects will help to achieve the objectives most efficiently.

C. Types of Prioritizatiom Models

HI/LO Model

Considered an "Affinity Chart", the HI/LO model can be used in the prioritization process[9]. In the HI/LO model, a 2x2 matrix is constructed that demonstrates the impact of the project/task and the complexity of the importance a task. The HI/LO method is the least complex method described here and is a good place to start. One can do this one with pen/paper or can make use of sticky notes or could create this inside a table with Excel or Word. Write each task or project on an individual sticky note, on a white board, large piece of paper, or flip chart and create a grid that looks like this:
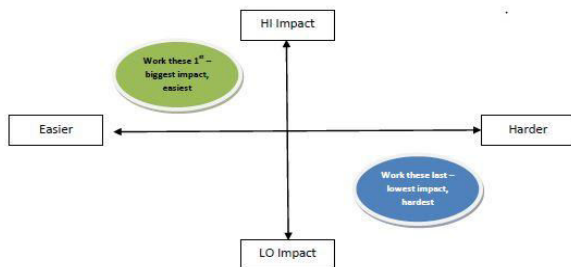
HI/LO Model[5]

Now, they can begin placing the projects or tasks in this grid, based upon the evaluation of that item. The projects and tasks that fall into the upper left quadrant are those that are easiest to do and have the highest impact[2]. Items in that category should be the top priorities. If there are too many items in this category, then consider all the items that fell into this quadrant and further refine the criteria associated with it (consider the CARVER method, for example). It is unlikely that one would be able to use the HI/LO method as the only method of prioritization, particularly when there are a high number of tasks; however, it marks a good first step in determining what should be worked first.

CARVER Model

The CARVER method[9] is a less complex method of prioritization than the Carpenter model; but, offers more weighting factors than the simpler HI/LO method. CARVER is an acronym for a military method of target selection. CARVER stands for Criticality, Accessibility, Return (or Recuperability), Vulnerability, Effect, and Recognizability[6].

Criticality: Defines how critical the target is with respect to the main objective and also tells about whether it moves significantly closer to the goal, or it is an insignificant item.

Accessibility: Describes about the means to tackle this project immediately, and also checks whether the project has any prerequisites or not.

Return: Describes the expected return on commitment of resources

Vulnerability: Describes about the vulnerability of the target and amount of resources required to take out and also the vulnerability of the the projects considered. A one-day project will score a high vulnerability rating, while a six-month project will score much lower. Similarly, an inexpensive project is more vulnerable than an expensive one[9].

Effect: If the target is destroyed successfully, how widespread will the impact be. If the project completed successfully complete your project, what effect will it have on your life as well as the lives of others.

Recognizability: Checks whether the project crystal clear or totally fuzzy. Clear goals with clear steps will score higher on recognizability than foggy goals with unclear steps.

For every potential target, assigning a value of 1 (lowest) to 5 (highest) for each CARVER factor, thereby creating a CARVER matrix. Then by summing the six CARVER values, can calculate a total score for each target, and those scores represent the targets' relative prioritization. The higher the CARVER score, the more "important" a target becomes.

Project	Criticality	Accessibility	Return	Vulnerability	Effect	Recognizability	Total
#1	5	3	4	2	4	3	21
#2	3	5	3	5	3	5	24

Example of CARVER Model[9]

In the above example, the CARVER methodology indicates that project #2 should have a higher priority than project #1.

The Carpenter Model
The Carpenter model[9] is a more complex model to use. One can always create their own version of this model, using different weights or values.

Instructions to be followed when using Edward D. Carpenter II's template:

Upon opening the Excel spreadsheet. Enter each of the criteria for judging a product or process on a separate line in the first column of initial gray box titled "criteria weight", replacing existing criteria with the new criteria. The criteria entered automatically will be placed in all the following comparison matrices, the summary matrix and the selection graph. Comparing the first criteria to each of the others by choosing the most appropriate value from the values chart and putting it in the matrix. Continuing the process by comparing the first criteria with each other criteria on the list. Then repeating the process for the criteria on the second, third, fourth, etc. lines, comparing them to the criteria not yet compared. Only putting a value in the solid gray areas; the reciprocal value will be calculated and inserted in the light gray areas automatically. Entering each of the products or processes being evaluated on a separate line in the first column of the second gray box. The entries automatically will be placed in all the other comparison matrices, the summary matrix and the summary graph.

Now, start comparing the choices to one another considering each criteria. After all the entries are made, results can be read in the summary matrix and the selection graph.

Eisenhower Decision Matrix Model
The Eisenhower Decision Matrix has two dimensions[8]. The first one is importance(important and not important), and the second one is urgency (urgent and not urgent).

All tasks are divided into four quadrants:
Important and Urgent
Important and Not Urgent
Not important and Urgent
Not important and Not Urgent.
Classifying each task according to these quadrants, and then dealing with the tasks according to the quadrant they belong to.

Quadrant 1: Important and Urgent
Obviously, It is required to do the tasks in this quadrant because they are important, and one should do them first because they are urgent. Usually, if there is short on time we then one can do these tasks first.

Quadrant 2: Important and Not Urgent
The tasks in this quadrant will be taken care after dealing with the tasks in Quadrant 1.
The tasks in Quadrant 2 are not urgent, but one have to take them very seriously because, if they don't, they will move to Quadrant 1.

It's better to take care of tasks before they appear in Quadrant 1. Because there are at least two problems with Quadrant 1 tasks: They have to deal with them quickly, and that can cause stress and worry and even effect the quality of our work.

For example, if one need to finish a report and present it to their boss two weeks from now, they might classify that task as important but not urgent. If they do nothing, in a week this task will become important and urgent. The best way to deal with this task is to prepare a plan for the task. This plan might include steps like gather the data, write a draft, ask a colleague for remarks, fix the draft, send it to their boss, set a time for the presentation, and present it. Each one of these tasks has a time in which it will appear in Quadrant 1 (important and urgent), but it's better to deal with an urgent task like "send a draft for remarks on Tuesday " in Quadrant 1 than dealing with "prepare a presentation to the boss by tomorrow"[4].

If they don't take care of tasks in Quadrant 2, they will find themselves in a situation where we are short on time: They can't wait for data we asked for and there's no time to get feedback on a draft. The results: They are stressed, worked until late at night, and created a lousy report.

So, Quadrant 2 (important and not urgent) deserves serious attention. Monitor this quadrant carefully. If needed, divide the tasks into subtasks. Start the tasks on time, even if they don't look urgent now. Otherwise, one will spend a lot of effort with questionable results, and paying attention to Quadrant 2 will result in good performance while keeping a good quality of life.

Quadrant 3: Not Important and Urgent
Sometimes people bother with tasks that are not important but those tasks has to be done urgently. Many times other people try to force to deal with these tasks. They are the time robbers. The way to reduce this problem is simply to protect the time.

For example, if someone insists on talking in person immediately, and it means one need to travel out of their office, find out why that meeting is so urgent. Maybe they can have a phone call instead, and maybe that person is going to be in their area next week. Protect the time.

Quadrant 4: Not Important and Not Urgent
The tasks in this quadrant are serious time wasters. When we identify a task in that quadrant, try to cancel it. If one can't eliminate it completely, try to minimize the time which has to be spent on that task.

IV. EXAMPLES OF TASK MANAGEMENT TOOLS

Todoist
Todoist is a trusted standard task management software. It offers a synchronized system that is available over iOS, Android, Windows, Mac, PC, and most major browsers. The

interface is intuitive and set up similar to Gmail's—on the left, there are categories (for example: due today, the next seven days, or "projects"), and on the right, there are the tasks themselves, which can be broken down into subtasks, sent out for collaboration, and can be filtered by their corresponding labels.

Its design is very simple, offers a mobile app, and lots of cool task-based features, like Todoist Karma, that aren't available elsewhere. But, the free version is limited in its capabilities and is not well-encrypted. Some of the mobile apps have design issues (like being unable to sort tasks).

Todo Cloud

Some people just want a to-do list, with not a whole lot of bells and whistles attached. Todo Cloud offers exactly that. Todo Cloud Create tasks, order it by label, set a date, and go. Tasks can also be broken down into multi-level priorities, starred, and (my personal favorite feature) "focus," or tasks that must be completed that day. This online task manager can be used for teams as well. Users can comment on, share, and sync their to-do lists, keeping everyone on task. Todo Cloud is simple to pick up and use, cross platform (iOS, Android, Mac, and PC), well-priced, and unique tools like geotagging. But, it Requires Internet access and mobile apps are only available in the paid version.

Taskworld

This free to-do list software. Built with the team in mind, Taskworld offers lots of options to keep files organized with assigned tasks, a robust commenting system, and custom workflows so everything stays together. Whether one can use this software for themselves or for a team of up to five, they will have everything organized and ready to go.

It Could act as a free lightweight project management software option, excellent free features for up to five users, and allows users to easily create repeated tasks. But, these is No integrations available in this software, users may feel overwhelmed with options meant for teams instead of for single use.

Pintask

The software offers users the ability to track due dates, attachments, and reminders so everything is done on time and on budget. This software is fully customizable through add-on extensions. It also allows the users to build their own perfect, low-cost task manager.

The drawback of this software is that the users must buy extensions that are otherwise free on other apps, like card mirroring.

Producteev

It is the top one free project management software. Producteev offers a gamut of powerful project management tools. Users can create unlimited tasks and subtasks, attach files to tasks, and turn emails into tasks by just forwarding

them along. All tasks can easily be labeled, assigned, arranged by priority, and made to be a recurrent event. Producteev is also a collaborative software, so all users can comment on others' task feeds. All tasks can be filtered by a host of variables like status and due date, has DropBox integration, offers a mobile app, and has strong collaboration tools. The only disadvantage of this is it doesn't Offers time-tracking options.

Trello

Trello is another powerful task management software that made the list of top free project management software. It relies on the Kanban system of project management for users to visually organize their tasks. Trello can be used to divide projects up by tasks, and then edit those tasks with descriptions, labels, checklists, and even attachments. Trello task management softwareis particularly helpful for teams working on separate tasks toward a greater project goal, where the tasks are in need of a pipeline. Trello has Intuitive layout and design, great for collaborative projects, and most companies and individuals are satisfied with the free version. But, Trello doesn't have a good way to to prioritize tasks between projects.

Wrike

Wrike is drag-and-drop task management system that's great both for individual use and for group projects. It creates and manage tasks based on due date and urgency with this tool. Users can use Wrike's "Spreadsheet View" to mass-edit tasks and, with Wrike's intuitive collaboration system, can share discussions and files that attach straight to tasks. Wrike also syncs with Google Drive, Dropbox, Box, and iCal, so users can keep all their projects and tasks aligned with their respective files.

Wrike offers a host of features and is, overall, a powerful project management product. Outstanding customer service, always new features, and makes collaboration easy.

Bambam

Bambam is a task management tool which is suitable for small companies , development teams , school administrators and freelancers. This software supports the features that can be optimized for agile notation. This software can be particularly used for its time tracking features and permission settings.

The disadvantages of this software are, is difficult to customize and it also lacks project management features like Gantt charts, and is difficult to scale to larger companies.

hiTask

hiTask is a tesm task management tool. It is an open source software. It offers many features including calendar, grouping, tasks and subtasks. Is has a organized user interface.

The only disadvantage of this software is one user can create only 10 projects with a limited storage space of 100MB

MeisterTask

MeisterTask is a reflection of the operating system it caters to i.e., Apple. And it focuses on simplicity, aesthetic, and function. MeisterTask comes very close to achive these three ideals. This task management software is so simple that one can open it up and be working within the first minute of use. The free version includes two free integrations, like with Drive, Slack, GitHub, or Zendesk. It has lots of great integrations, intuitive, standout iOS app.The main drawback of this software is there is no mobile version for Android and it gives preference only to developing for Apple.

CONCLUSION

The Task Matrix will have many features. The first and most obvious use of the application is take the current 'to-do' list and sort all the activities into the appropriate matrix. Then, assess the amount of time required to accomplish the lists and, if necessary, reallocate activities.

Task Matrix also may be used to decide priorities among possible causes of a performance weakness or problem to address, or to choose the best solution(s) for a given problem. Decisions are based on agreed upon criteria, thus reducing the potential for choices based on hidden agendas.

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