

A Novel Ticket-based Human Resource Efforts Tracking and Estimation System for UbiComp

KASHMIRA DESHPANDE

ME. Computer Science
STES, Smt. Kashibai Navale college of Engineering Pune, India

P.N.MAHALLE

Department of Computer Engineering STES, Smt. Kashibai Navale college of Engineering
Pune, India

Abstract: - *The Efforts tracking and estimation of HR in Ubiquitous computing is the intranet server application. This application can manage the recordings, controlling and monitoring of employee's workflow and the efficiency of their work. The purpose is to make sure that the employees are punctual and do their jobs on time. This system is integrated with the ticket system to anticipate the employee's work flow and the project's status to make the administrators work easier. The administrators can easily trace the work status and the project status of the employees compare to manual paper recording and file keeping system. This system automates the tracking of employee's actual work which will ultimately improves the performance of the organization through improved employee performance. Moreover, to increase the productivity of the company as well as of employee's the system will estimate the time on hour basis rather than day basis.*

Keywords: - *performance, efficiency, Ticket system.*

I. Introduction

In the theoretical world, an ideal machine is one that performs perfectly at peak efficiency all of the time. In the workplace of the non-idealized real world however, employees are neither machines nor are they perfect. Therefore, a system of performance management which is directly related to the efficiency of the employees is necessary to maximize productivity of the company. This is done by tracking employee's tasks in the workplace by providing a consistent framework of rules and expectations with tickets system and respective notifications.

Objective:

1. To know the area, that helps in enhancement of the productivity.
2. To understand the impact of employee's performance on company productivity.

3. To familiar with the fundamentals of the productivity.

Scope:

1. Establishment of new ways to increase employee's productivity.
2. Enhancement of performance of employee. Profit and wealth maximization of the company.

II. RELATED WORK DONE

There are many software technologies available for employee efficiency management system. None of the software in the market provides a service which will give the hour based estimation with ticketing system. I will integrate the ticket system concept with this software to achieve the best performance of it. To develop this software we are using HTML and PHP languages.

- Existing software's:

1. Project Management Software

For many professional project managers, no software can rightly call itself a project-management tool if it doesn't allow you to map out a project's tasks and visually display how they interconnect. This type of project plan provides a powerful way to define the project schedule, understand the critical path for a project, and assess and allocate staff resources. It generally includes:

- A detailed breakdown of tasks to be completed.
- Task assignments, identifying who is responsible for which aspects of the project.
- A time estimate for each task.

Formal, mapped-out project plans are not for everyone, however. Some project managers we spoke with found these detailed plans time-consuming and inflexible, and often so complicated that they discourage updates. These respondents also felt that the Gantt chart visuals typically used by these tools were too complex to walk through with their team members, let alone those outside the core team.

These project managers typically created less formal project schedules or process flows with Excel (available for qualifying organizations through Techs up), or using diagramming tools like Microsoft Visio (available for qualifying organizations through Techs up), OmniGraffe, or Gliffy. If you use Excel, you can find a number of free add-on templates for making Gantt charts or other project schedules at office.microsoft.com.

2. Liquid Planner

This software does the project scheduling and organization. Realistic scheduling based on priority and best case, worst case estimates. This software works on the team planning, distributes tasks. Real time, Project intelligence for

understanding team efficiency, resource loads, project profitability. Move Project collaboration out of email and into a shared system that automatically organizes documents and comments. Frictionless time tracking for billing or reporting, Team members log time and submit weekly timesheets for manager review and approval.

3. VIP Task Manager

VIP Task Manager provides a number of features that help organizations manage their Business activities. In particular, the software is great for planning employee tasks and Assignments, creating and prioritizing to do lists, planning and tracking projects, sharing Data and collaborating on tasks, developing schedules and user calendars, and building.

Reports, visualizing task data in charts, creating task workflows the benefit of using VIP Task Manager in your business is that you get a complete solution for group collaboration and task management. The software allows your personnel to share their tasks, collaborate on projects, report on performance, and manage personal to-do lists. Besides, VIP Task Manager provides the following

Advantages:

- Get a real-time task list, project tree and employee schedule
- Boost company performance, effectiveness and productivity
- Reduce staff management time and get your office organized
- Monitor individual and overall task progress instantly
- Meet deadlines and achieve goals with estimated results

III. BRIFE DESCRIPTION

One of managers and administrators most important functions is to oversee resources of the

organization, human capital being one of them. This system can be used to optimize the productivity of individuals, teams, and ultimately an entire organization.

This system gives:

1. Accomplishments related to each job function
2. Accomplishments related to established goals and performance expectations
3. Training and development needs if any.

This system also deals with the project management. The project will be handled by the administrator who will be the head of the company. Administrator will assign the particular project to one manager. Then the manager will divide his project into the tasks and he will assign to the employees. Manager estimate time while assigning the project. System is integrated with the ticket system which is the novelty of the system. Tickets are generated for each task. Color of ticket varies depending on performance of employee on respective tasks and its workflows. The system uses 4 colors to represent the workflow of the employee.

Table 1

Color code	Color Name	Description	Ticket
001	White	Newly assigned project	
002	Yellow	ongoing project	
003	Blue	Tasks/Project on hold	
004	Red	project in critical zone	
005	Green	completed project	

This is useful for calculating the performance of employee and productivity of the company. The performance of the employee will be calculated by the formula $\text{Performance} = \text{time required to}$

complete the task / actual estimated time
 $\text{Efficiency} = 1 / \text{Performance}$. (Time will be estimated and calculated in hours.)

IV. PRODUCT PERCEPECTIVE

Employee Management System is a tool to relieve the user from the task of calculating employee efficiency manually. It is an intranet server side application. Each employee will have personal account with login id and password. This system will keep track of employee schedule. There will be a notification on employee's home page when new task will be allocated to him. It allows the employee to check allocated tasks along with its details. Project details include kick off time, estimated time, remaining time and status of that task. Task will be chosen by employee according to priority. Employee will have access to documents related to that project.

V. USER CLASSES AND CHARACTERISTICS

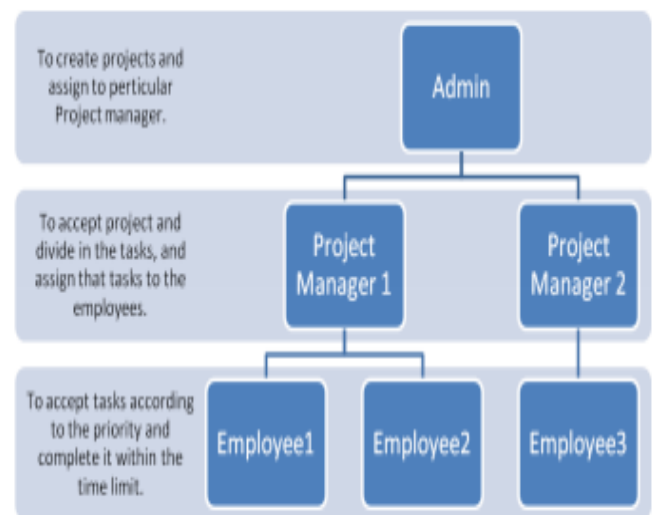


Fig. 1 Hierarchy of the user class 1. Administrator

Administrator is a person who deals with external market for getting projects from customer

He is responsible for completion and delivery of project. He assigns project to project manager by

considering domain of project. He can view the status of the project through ticket system, hence

He can contact with project manager to take a quick action.

2. Project Manager

Project manager divides project into tasks. After the creation of the tasks, he allocates tasks to employee according to employee's details with estimated time and ticket for each task. Employee details will contain employee skills, leaves, pending tasks of employee, current tasks of employee. Project manager needs to generate notifications to the employees on their pending tasks.

3. Employees

Before starting any task, employee needs to give time required for completion of each tasks allocated to him. He has to update task completed. He should give comment on pending tasks. He can apply for leave with reason and number of days to project manager. An employee needs to perform work depending on priorities given to the task.

It is a company hierarchy. Each user class is expected to at least know the basic use of the underlying technology in order to use them. User interface will be different for different level of hierarchy.

VI. APPLYING SOFTWARE ENGINEERING APPROACH

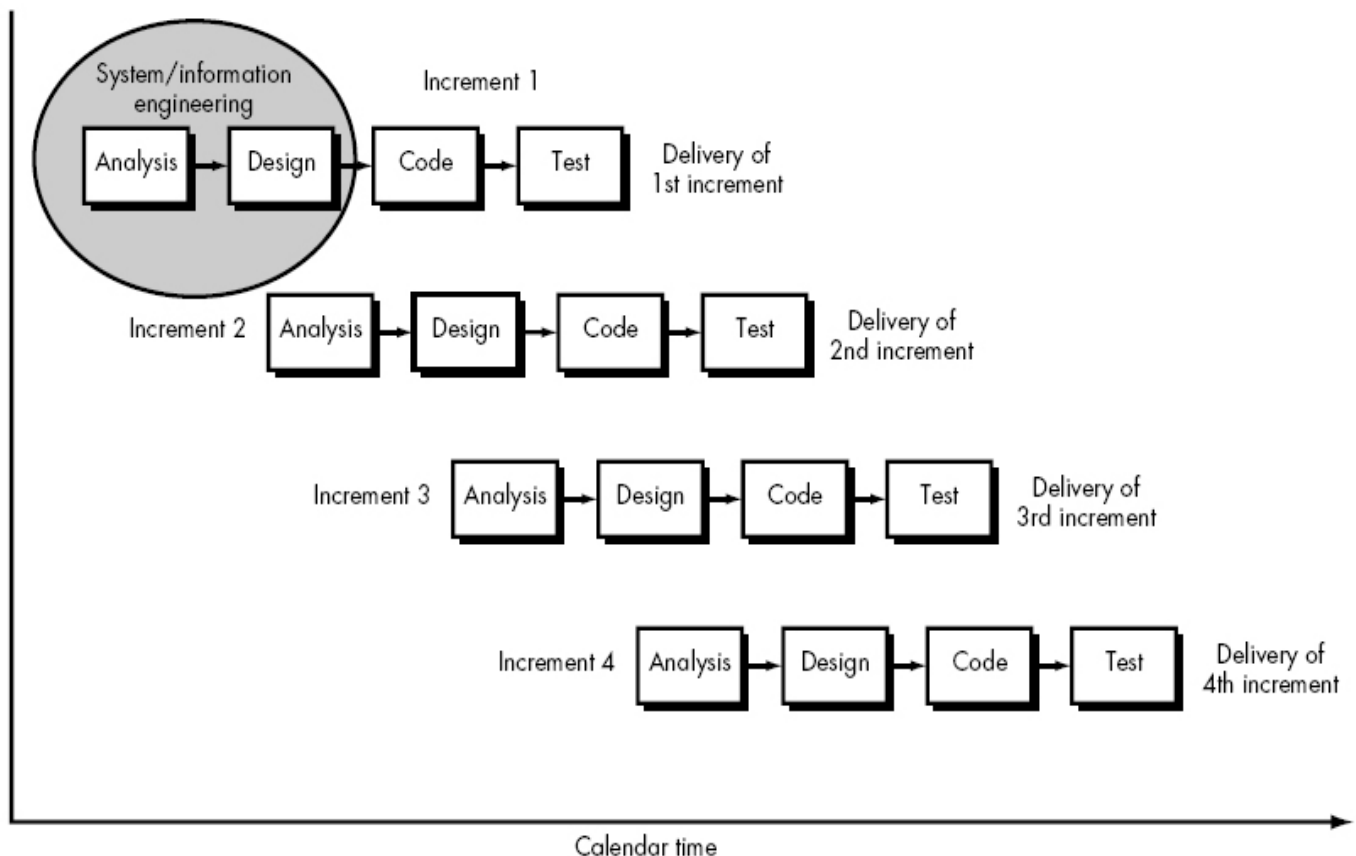


Fig.2 Life cycle Model: Incremental Model

The product has been developed following the Incremental Model of software development. In this approach each increment produces a

deliverable version of the software. This forms the first increment of the software. During this increment there were four phases, viz.

requirement analysis, design, coding and testing. At the end of these phases the Employee efficiency management software was built. The next iteration will have all these phases but the software development will aim towards adding features of the process in the system etc. Thus the next increment of the software will be based on the previous one. This is how the Incremental Approach is used for the development of evolving software like Employee efficiency management.

The Incremental model thus became most suitable for the development of this software. The incremental model combines elements of linear sequential model (applied repetitively) with the iterative philosophy. Each linear sequence produces a deliverable “increment” of the software.

At the end of this increment the first version of Employee efficiency management is ready for delivery.

The software development during each increment will follow the sequential model which goes through the following phases:

- **Software requirement analysis:** Requirements for both system and software were documented and reviewed.
- **Design:** The Design phase was multi-step. As the design phase went through multiple iterations, each iteration produces a view of the more detailed than the previous one. It decided the software architecture of the Project Management System. The choice of programming language was also made at this point. The design phase then gave way to the coding phase. Even after the coding phase started minor changes to the design took place due to some technology constraints, which could not be understood during the design.
- **Coding:** This phase translated the design into machine readable form. The Standard coding conventions were strictly followed

in order to make the code easy to follow up.

- **Testing:** This phase focused on the logical internals of the software assuring that all statements had been tested and reliable and desired results were achieved.

VII. ANALYSIS MODELS

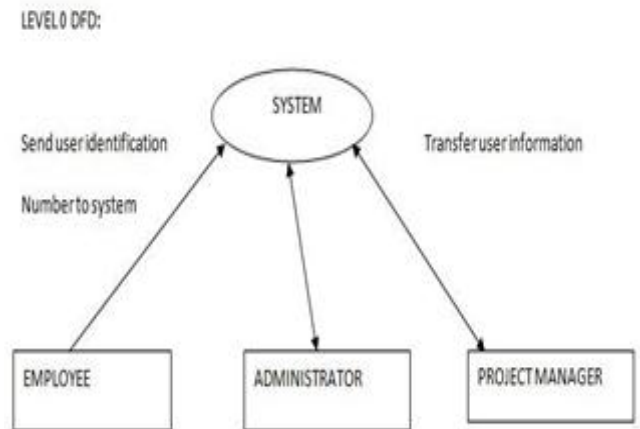


Fig.3 DFD Level 0

In the fig. 3 Employee sends user identification number to system. There is both way communication between Administrator and the system. Project manager transfers and shares the user information with the system.

VIII.SYSTEM ARCHITECTURE

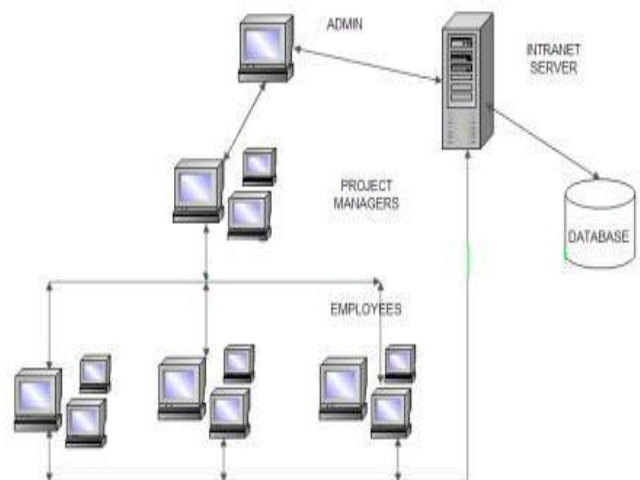


Fig.4 System Design

As shown in the fig.4 the system design contains the employees under project manager. Project manager under Administrator. All the systems are connected to the Intranet Server and the Database at the back end.

IX. ALGORITHM DESIGN

- Accept_project()
- Create_tasks()
- Performance_evaluation()
- Fix_tasks()
- Employee_details()
- View_reports()

Fix_task ()

```

{
  If ( newtask_avail==true)
  {
    If (Priority [newtask]>priority[currenttask])
    {
      Accept (newtask)
      Currenttask=Newtask
      Estimate time for completion of task
    }
  }
  If (commandclick=="submit")
  {
    Endtime=record system time
    If (endtime<= currenttask[estimate_time])
    {
      Print "Task completed successfully."
    }
  }
  Else
  {
    Print "Delay in completion! Report reason."
    Currenttask[reasoning]=accept reason
  }
}

```

```

}
}
• create_task( newproject)
{
  Project=newproject Divide
  Project into n taska
  For (each task i 0 to n-1)
  {
    Generate ticket for each task.
    Assign task to employee
    Estimate time for each task'
    Add document link.
  }
}
}

```

X. MATHEMATICAL MODEL

• Set Theory Analysis

1) Set Theory Analysis

Let 'S' be the 'Employee Efficiency Management System'.

$S = \{ \dots \dots \dots \}$

Set S is divided into 4 modules $S = \{S1, S2, S3, S4\}$

S1=Employee details Module

S2= Task Creation Module

S3= Fix task Module

S4= Performance Evaluation Module

2) Identify the inputs.

Inputs = $\{X1, X2, X3, \dots \dots \dots, Xn\}$

X1=Input action done by accepting projects.

X2=Input action done by assigning tasks to Employee.

3) Identify the output as O.

Outputs = $\{Y1, Y2, Y3, \dots \dots \dots, Yn\}$

Y1= Output identified by no of task completed.

Y2= Output identified by color of ticket.

Table 2. Mathematical model

Sr No.	Description	UML Design observations.
1.	Problem Description	
	Let S be a system which do Employee Efficiency Management System; such that $S = \{S1, S2, S3, S4, S5\}$ where S1 represents Employee details Module; S2 task creation Module; S3 represents fix task Module; S4 represents Performance evaluation Module	S holds list of modules in the system
2.	Activities	
	2.1 Activity I Employee details module Let S1 be an Employee details Module. S1= {name, skills, project_completed}	If response to employee details is Match then go for resolve Else Send message employee not found
	Where, Name: Employee name Skills: Type of skills, location, Hardware Project completed: No. of project completed.	
	2.2 Activity II Accept the project and divide it into tasks. Let's S2 be a set of task creation S2={Name, Time ,Employee} Where, Name: name of the task. Time: time required to complete task. Employee: whom task is assigned. Here ticket is generated along with task assignment.	Initially ticket color is white. If employee started task then it will become yellow indicating task is in progress.
	2.3 Activity III Let S3 be the set of fix task module. S3:{Name, Priority} Where, Name = Name of the task. Priority = priority of the task.	Task fixed by employee according to task priority.
	2.4 Activity IV Let S4 be a set of performance evaluation module. S4:{Estimated_time, Actual_time, Number} Where, Estimated time: Time estimated for each task. Actual time: Actual time taken to complete task. Number: Number of task completed in time.	

XI. CONCLUSION

1. This software will provide an opportunity to reflect upon actual work done by the employee.

2. This system will give:

- a. Accomplishments related to each job function.
- b. Accomplishments related to established goals and performance expectations.
- c. Training and development needs if any.

This is beneficial for the employees and the growth of the company.

3. This system will automate the tracking of employee's actual work which will ultimately improve the performance of the organization through improved employee performance.

4. Motivated workforce System helps employees to set plan work and identify skills in order to achieve them. Employee is motivated as there is clarity of what he is required to do in a given period. Increased clarity brings greater focus on job related activities, which in turns facilitates better performance, efficiency and commitment. This increases the productivity of the individual employees and the organization stands benefited out of improved performance of employees.

5. Setting of performance targets /objectives, agreement on measurement criteria and organizations expectations of desired performance level brings to transparency to the approval process.

6. System helps organization in taking people related decisions such as career planning, career development, promotions, training and development opportunities, and succession planning. Meritorious employees are rewarded better with increased compensation, promotions, leadership grooming opportunities, job rotations, etc. and help retain top talents in the organization by satisfying their growth and development needs.

7. To develop employees system accords an opportunity to develop an employee through the identification of gaps in skills and competencies. Once deficiencies in skills and competencies has

identified, suitable training and development programs can be established for rectifying the gaps/deficiency. This results in personal and professional development of employees.

8. The Estimation of the work is on hour basis not on a day basis so the productivity of the employees as well as company increases.

XII. FUTURE SCOPE

- This software is developed to track the employees' performance and to optimize the company productivity and to enhance employees' performance as we can achieve it with the integration of the ticket system.
- We can develop the Ledger of the software to upgrade it as per client's requirement.
- According to the requirement in the market, there is great demand for this software also we are automating it with the ticket system so there is scope to develop the App of this current software.

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