Study & Analysis and Issue & Challenges in context of Human Resources Management in SEPM using Apriori algorithm

Mr. Manoj Pawaiya¹, Ms. Khushboo Karodiya²

Computer Science Department

¹Prestige Institute of Engineering and Science, Indore, (India)
Address: “Prestige Vihar”, Scheme no 54, Vijay Nagar, Indore (M.P) INDIA

²Patel Group of Institute Indore (India)
Address: Patel Engineering College, Near Ralamandal, Indore (M.P) INDIA

Abstract: In this paper, we discuss what the impacts of Human Resource IT Company are. Human Resource, are the most precious resource of any organization and forms its backbone. There is always a team of highly dedicated workforce, committed to its goal that makes any organization successful. It is end goal of all economic activities together with prime mover. Proper Manpower planning, their future growth, development needs and fulfillment of day-to-day requirement are vital for the prosperity and health of any organization. apply the Apriori Algorithm Human Resource in IT has become the enabler for survival, innovation and growth and is the key driving factor for organization’s competitiveness.

Keywords: Human resource management, software project, management, Apriori Algorithm

I. Introduction

Human Resource, are the most precious resource of any organization and forms its backbone. There is always a team of highly dedicated workforce, committed to its goal that makes any organization successful. It is end goal of all economic activities together with prime mover. Proper Manpower planning, their future growth, development needs and fulfillment of day-to-day requirement are vital for the prosperity and health of any organization. Most successful organization has devised ways to keep their human resource highly satisfied and makes them participative in crucial matter related to the organization. Computerized systems are being used to this effect in a big way.

All IT project activities are executed by team member whether the project can be successful to a large degree depends on the team member. Project manager distribute the entire project activities to the team member based on their skills, personalities, interest

The Crucial factor for the success or failure of software development projects is the qualification of project managers but how can future project managers be prepared for their role? To successfully manage a software project, theoretical knowledge is not sufficient. Practical experience is necessary. Such a level of abstraction is appropriate for a rough estimation of overall project variables such as duration, effort and costs, but does not solve typical tasks of a project manager such as deciding on process alternatives (e.g., inspecting a design or code document, testing a module), assigning tasks to persons, or scheduling the various activities. Simulation models with an explicit representation of objects related to software development processes, i.e. items (design or code documents) and developers might be better suited for supporting these decisions. Typically, discrete-event simulation models allow for such an explicit representation of a multiplicity of objects of the same type.

II. Literature Survey

Software project management
Software project management is the art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled.

Human Resource Management System
The key supporting element in the management of organization is Human Resource Management (HRM) function. HRM is the only responsible factor ensuring that the right people are available at the right place and at the right time to execute corporate plans with the highest level of quality i.e. manpower planning. But manpower planning is only a part of not whole HRM however manpower planning is core of HRM supported by other aspects of HRM. Human Resource Management system presents integrated picture of all supporting the planning and control of personnel activities. It provides a powerful tool for monitoring, integrating, control and reevaluating human resource. It includes various activities related with employee like: Recruitment, Training, Benefits and Compensation etc. HRMS has both tangible and intangible benefits. Some tangible benefit areas include:

1) HR productivity improvements
2) Employee and manager productivity improvements
3) Overhead and outsourced service fee avoidance
4) Compliance and error reduction
5) Improve employee retention
6) Strategic business impact

Intangible benefits are most difficult to quantify, but hold an important place. Some of the intangible benefits
1) Brand advantage
2) Strategic advantage
3) Competitive advantage
4) Intellectual capital
5) Organizational advantage

A Framework Suggested for HRM

1) **External environment:** It consists of the environment outside the organization that includes Political system, economical system, legal industrial relation, education culture, technology, labor and product markets etc.

2) **Institutional structure process for HRM:** It consists of all the HRM activities required for managing human resource like collective and individual strategic activities, selection performance appraisal etc.

3) **Desired optimal HRM outcome:** It covers the required outcome, for which management of human being is done like strategic integration commitment quality, flexibility cost effectiveness.

4) **Desired overall optimal performance:** It is responsible for overall outcome at organization level like organizational effectiveness employee-employee relationship etc.

III. Proposed Framework

Analyzing Human process contribution in achieving organizational goal. But for comparing software, technological view is also important. In this report for comparing human resource software a framework is being proposed.

It is also four tier model which include:
1. **Organizational Structure**: Type of organization, size of organization etc.
2. **Human Process**: Human resource modules implemented like employee selection, training etc.
3. **Technology**: Architecture, Database, Security etc
4. **Benefits & Quality attribute**: User-friendly, performance, reliability etc.

**Benefits of HRMS**

Key benefits achieved after apriori algorithm Implementation in HRM in Software Engineering:

- Better Decision Support
- Better Operation Control
- Efficient Cost Management
- Enable Internal Performance Measurements
- Improved responsiveness to changing market/ global conditions
- Enable Transformation
- Alignment to new Organization Structure e-Corporation

**Project management**

Project management is defined as the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements.

The project management framework in Figure 1.1, there is 9 project management knowledge areas, which describe project management knowledge and practice in terms of their component processes. Table 1.2 illustrates the overview of project management knowledge areas and project management processes. The four core knowledge areas are briefly described below:

- Project scope management: involves defining and managing all the work required to complete the project successfully.
- Project time management: includes estimating how long it will take to complete the work, developing an acceptable project schedule, and ensuring timely completion of the project.
- Project cost management: consists of preparing and managing the budget for the project.
- Project quality management: ensure that the project will satisfy the stated or implied needs for which it was undertaken.

![Project Management Framework](image)

**Figure 1.1**

**Project Management Framework**

These are called core knowledge areas because they lead to specific project objectives.

There are also four facilitating knowledge areas of project management:
Project human resource management: is concerned with making effective use of people involved with the project.

Project communications management: involves generating, collecting, disseminating, and storing project information.

Project risk management: includes identifying, analyzing, and responding to risks related to the project.

Project procurement management: involves acquiring, procuring goods/services for a project from outside the performing organization.

These are called facilitating knowledge areas because they are the processes through which the project objectives are achieved. The ninth knowledge area, called project integration management, is an overarching function that affects and is affected by all of the other knowledge areas.

Project portfolio management is an emerging business strategy, in which organizations group and manage projects as a portfolio of investments that contribute to the entire enterprise’s success.

Throughout each knowledge area, there are many commonly used tools and techniques to assist project managers and their teams in achieving project objectives. Table 1.3 lists some commonly used tools and techniques in the nine project management knowledge areas.

**Apriori Algorithm**

Apriori Algorithm is an influential algorithm for mining frequent itemsets for Boolean association rules.

<table>
<thead>
<tr>
<th>Knowledge Area</th>
<th>Commonly Used Tools and Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration management</td>
<td>Stakeholder analysis, Project plans, Project management software, Change control boards, Configuration management, Project review meetings, Work authorisation systems, Project leadership, Executive sponsorship</td>
</tr>
<tr>
<td>Scope management</td>
<td>Net present value, Return on investment, Payback, Weighted scoring models, Business cases, Project charters, Scope statements, Work breakdown structures, Statement of work, Requirements analysis, Scope change control</td>
</tr>
<tr>
<td>Time management</td>
<td>Gantt charts, Network diagrams, Critical path analysis, Program evaluation review technique, Critical chain scheduling, Crashing, Fast tracking, Milestone reviews</td>
</tr>
<tr>
<td>Cost management</td>
<td>Earned value management, Project portfolio management, Cost estimates, Cost management plan, Financial software</td>
</tr>
<tr>
<td>Quality management</td>
<td>Six Sigma, Quality control charts, Pareto diagrams, Fishbone or Ishikawa diagrams, Quality audits, Maturity models, Statistical methods</td>
</tr>
<tr>
<td>Human resource management</td>
<td>Motivation techniques, Empathic listening, Team contracts, Responsibility assignment matrices, Resource histograms, Resource loading, Resource leveling, Team-building exercises</td>
</tr>
<tr>
<td>Communications management</td>
<td>Communications management plan, Conflict management, Communications media selection, Communications infrastructure, Status reports, Meetings, Virtual communications, Templates, Project web sites</td>
</tr>
<tr>
<td>Risk management</td>
<td>Risk management plan, Probability/impact matrix, Risk ranking, Monte Carlo simulation, Top-ten risk item tracking</td>
</tr>
<tr>
<td>Procurement management</td>
<td>Make-or-buy analysis, Contracts, Requests for proposals or quotes, Source selection, Negotiating, Electronic procurement</td>
</tr>
</tbody>
</table>

**Table 1.2**

**Problem Domain**

The most precious resource of an organization, which forms its backbone, is its Human Resource. Behind every successful organization there is a team of highly dedicated workforce committed to its goal that makes the difference. Human Resource is not only the prime mover of all economic activities but also the end goal of such
activities. Proper Manpower planning, their future growth, development needs and fulfillment of day-to-day requirement are vital for the prosperity and health of any organization. Most successful organization has devised ways to keep their human resource highly satisfied and makes them participative in crucial matter related to the organization. Computerized systems are being used to this effect in a big way.

It is challenging because:

1. Human are most important and costly asset of any/every organization.
2. It is a strategic component, which provides competitive advantage.

1. Resources planning
1.1 Human Resources
1.1.1 Project Manager
The success of software projects mainly depends on the quality of project management. The successful projects are always characterized by effective project planning, progress and quality control, and most of all by qualified project managers. To improve the situation in software development, first of all we must improve the quality of software project management by better education of (future) project manager.

Q. How do we select the project manager?
1.1.2 Team Member
Q. How do we select the Team Member?

1.2 Software Resources
Which Software is/are required completing that product
1.3 Hardware Resources
Which Hardware is/are required completing that product

Motivation
The importance of Human Resource Management is exponentially growing because of globalization which require cross-cultural interest to promote motivation and subsequently productivity considered to be two potential factors for global competitiveness for productivity, cost and quality.

Solution Domain
Parameter for selecting the Project manager
- Technology
- Work Experience
- Number of Successfully delivered Project
- Completion Time period for each project
- Size of Team Member are managed in each project
- How much salary they take
- Terminology Gap
- How many Bugs they are facing
- How many Bugs are successfully resolved by Project manager

Parameter for selecting the Team member
- Technology
- Work Experience
- Number of Successfully delivered Project
- Completion Time period for each task
- Types of task are successfully completed
- How much salary they take
- Terminology Gap
- How many Bugs they are facing
- How many Bugs are successfully resolved by Team member

Apply Apriori Algorithm
Make cluster on the bases of above criteria
The Apriori Algorithm -- Example

Experimental Analysis

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PROJECT</th>
<th>TEAM</th>
<th>% COMPLITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P1</td>
<td>T1, T4</td>
<td>98%</td>
</tr>
<tr>
<td>2</td>
<td>P2</td>
<td>T1, T3, T4</td>
<td>80%</td>
</tr>
<tr>
<td>3</td>
<td>P3</td>
<td>T2, T4</td>
<td>85%</td>
</tr>
<tr>
<td>4</td>
<td>P4</td>
<td>T1, T2, T3, T4</td>
<td>90%</td>
</tr>
<tr>
<td>5</td>
<td>P5</td>
<td>T1, T4</td>
<td>90%</td>
</tr>
<tr>
<td>6</td>
<td>P6</td>
<td>T2, T3, T4</td>
<td>60%</td>
</tr>
<tr>
<td>7</td>
<td>P7</td>
<td>T1, T3</td>
<td>85%</td>
</tr>
</tbody>
</table>
Apply Apriori Algorithm

<table>
<thead>
<tr>
<th>Team</th>
<th>Occ</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>6</td>
<td>533</td>
<td>89</td>
</tr>
<tr>
<td>T2</td>
<td>5</td>
<td>360</td>
<td>72</td>
</tr>
<tr>
<td>T3</td>
<td>7</td>
<td>530</td>
<td>75</td>
</tr>
<tr>
<td>T4</td>
<td>8</td>
<td>658</td>
<td>83</td>
</tr>
</tbody>
</table>

SUPPORT of(x) = \sum [\% of Completion] / Sum of (Occurrences in Project)

<table>
<thead>
<tr>
<th>Team</th>
<th>Occ</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1, T3</td>
<td>4</td>
<td>345</td>
<td>87</td>
</tr>
<tr>
<td>T1, T4</td>
<td>5</td>
<td>448</td>
<td>90</td>
</tr>
<tr>
<td>T3, T4</td>
<td>5</td>
<td>385</td>
<td>77</td>
</tr>
</tbody>
</table>

Team member T1 and T3 give best effort as compare to other

IV. CONCLUSION

Though data mining techniques employ great participation in solving problems in various domains, the efficiency of data mining algorithms is proved through the application of the same in linguistics. The performance of two different algorithms of association rules in semantic validation of sentences is compared for efficiency. This system is developed and implemented for domain specific English language sentences. The capabilities of the system will increase with its usage. As future enhancements, by removing the constraints on the structure and types of sentences, the system can be extended for more types of sentences in a more general way. Semantic analysis can be improved by eliminating the constraint on the specific domain and can be enhanced for open domain.

References

[4] Managing software projects, RICHARD MATEOSIAN, richard.mateosian@sacredheart.edu 2003 IEEE Published by the IEEE computer Society
[7] Communication, Knowledge and Coordination Management in Globally Distributed Software Development: Informed by a scientific Software Engineering, Adel Taweel, Brendan Delaney, Theodaros N. Arvanitis and Lei Zhao University of Birmingham, UK, a.taweel@bham.ac.uk, 2009 Fourth IEEE International Conference on Global Software Engineering
[8] Recommending effort estimation methods for software project management, Bernhard Peischl, Mihai Nica Institute for Software Technology, Technische Universitat Graz, 8010 Graz, Austria, peischl endlessly@ist.tugraz.at Markus Zanker, 2009 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology – Workshop
[9] Guiding Global Software Development Projects using Scrum and Agile with Quality Assurance, Christelle Scharff Pace University, New York, NY, USA cscharff@pace.edu SEEE&T 2011, Waikiki, Honolulu, HI, USA
[10] The Practical Method of Motivating Students to Iterative Software Development, Ondřej Macek and Martin Komárek Czech Technical University in Prague. Faculty of Electrical Engineering, macekond, komarem@fel.cvut.cz, CSEE&T 2011, Waikiki, Honolulu, HI, USA