HR-DSS - IT’S ROAD MAP FOR NEXT GENERATION

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ABSTRACT

The competition in organizations’ today is not for capital or technology or market share, but for talent. Traditional HRM has come a long way from its past to what it is today. Role of technology in HR functions is the need of the hour and it has redefined HR in many ways. DSS tends to be aimed at the less well structured, complex problem that upper level managers typically face. An intelligent decision support system (IDSS) is developed to assist decision makers in unstructured decision making situations by integrating human knowledge with modeling tools. HR IDSS applications have a rich potential for future HRM activities. The IDSS applications and techniques applied are developed keeping in mind the expertise needed. Intelligent Decision System (IDS) technologies can be used to provide realistic and reliable decisions, apart from improving the success of decision making processes.

The authors attempt to elaborate the concepts related to IDSS, the application areas and the associated research related to human resources decision making application known as HR DSS. In this paper, the authors discuss about traditional HR functions and the need for implementing IDSS in human resource management (HRM) activities specifically Human Resource Allocation in IT organizations. This research identifies the potential intelligent techniques that can be used in HR DSS application. The authors have described the past, present and the current practices of HRM and explore the future trends in application of DSS in HR.

The objective of this paper is to review the customary HR practices related to Human Resource allocation, the current practices and application of DSS in Human Resource Allocation and to explore the future trends in application of IDSS in HR.

Keywords: Decision Support System (DSS), HR Application, Human Resource (HR), Intelligent Decision Support System (IDSS), Resource Allocation.
I. INTRODUCTION

In the past the HR function was referred to as personnel Management and administration. The typical activities under this were recruitment, selection, compensation and development. The personnel managers would concentrate on labour management and did not participate in the organization’s policy and strategic decisions. Since early 1980s, the personnel management started to move towards human resource management, due to which now HR professionals were expected to be involved in strategic business decisions. During this time, the HR function was still considered to be performed exclusively by the Human Resource department, and the activities were spread among three levels in the organization. The lowest level which was the operational level was responsible for handling the routine operations of the organization. The middle level is the managerial level which was mainly concerned with managing the existing workforce and how to get work done through retention strategies and growth opportunities. The top level of the organization was the strategy level. HR function can be instrumental for the future development of business. The main responsibility was to get the qualified people, and design the policies and programs for planning human resource requirements for the future.

However, problem of coordination and integration with the middle management level, and the lack of the decision making powers had an adverse impact of HR functions. The detail routine tasks and extensive paper work also made the HR function inefficient. The business world is becoming more and more demanding: the increasing competition and globalization in the world business, requires the business to have the capability for surviving for a long term and thus improving productivity to gain a larger market share. The driving force for HR transformation is technology advancement. As one of the early IT adopters in 1980s, HR function used to employ IT for managerial processes, focusing mainly on payroll processing, with less importance being paid to changing HR practices. DeSanctis (1986) defined an HRIS as a “specialized information system within the traditional functional areas of the organization, designed to support the planning, administration, decision-making, and control activities of human resource Management.” Haines and Petit (1997) later considered “HRIS as a system used to acquire, store, manipulate, analyze, retrieve, and distribute pertinent information about an organization’s human resources.” An HRIS system can eliminate the errors made by humans in these processes which don’t allow them to focus on creativity and innovativeness. Any organization can derive benefits from using an HRIS for computerized operations and availability of accurate data in the shortest possible time.

With the rapid development of the IT industry, companies are now facing tough competition. To be successful, companies have to have efficient project plans in place to reduce the cost of software development. Software engineers have typically focused much of their attention upon the software components of the systems. It is also very important to consider the overall structure of the systems, both in order to improve system functioning and also as a way to better understand the role of the individual software components of such systems. In considering systems of such nature it has become increasingly clear that the role of resources is often overlooked. There is a need to control people and processes, and to efficiently allocate resources in order to achieve specific objectives while satisfying a variety of constraints. Usually, the software project scheduling problem should consider how to allocate human resources to each task.

Human resource information systems (H.R.I.S.) provide valuable tools to assist human resource professionals in serving employees and their employers. However, human
resource managers need to be mindful that H.R.I.S. is only one tool that is available to assist in the human resource function and it only provides information for decision making.

It can educate the line managers who are not proficient in certain aspects of employee selection, such as the psychological parameters, skills and attitude.

The need of the hour is an HR DSS which helps the employer to see how people will react to different employment offers or work situations. If the modeled situations are realistic it will be highly accurate. A company which is having trouble attracting sufficient qualified people despite its best efforts at matching or offering something different which is an HR DSS, based on data from the appropriate population, would show what mix of benefits - both tangible and intangible - will achieve its target. Active DSS is an output of new DSS technologies and also known as a part of Intelligent System applications. The applications of Active DSS are many. Decision support system methodology, which is being used for a long time in consumer market research, is now being applied in the human resource management field to help employers to achieve this balance.

An Intelligent Decision Support System (IDSS) are tools to help decision making process where uncertainty or incomplete information exists and where decisions involving risk must be made using human judgment and preferences[8]. Intelligent systems are developed to accomplish two main functions. An IDSS needs to show what data is available and then streamline the flow of information which leads to knowledge. Secondly, it is a supporter of an effective and productive decision making that is suitable to the user needs. For any organization the most valuable and important asset is Human and is managed by Human Resource experts. HRM system is one of the important components for the success of an organization. Human is important and a very valuable asset for an organization and managed by Human. Besides that, decision making for unstructured processes in HRM usually depends on human judgment and inclination. Nevertheless, human decisions have limitations because sometimes people forget the crucial details of the problem, and a fair judgment and reliability are very important in any types of decisions. DSS applications which are embedded with intelligent components can improve the traditional DSS such as for reasoning and learning proficiencies, are known as IDSS. In order to improve human resource decisions, the efficient HRM applications are the need of the hour to produce precise and reliable decisions.

II. REVIEW OF LITERATURE

The procedures followed for acquiring the right candidate involves lot of time and effort. There may be situations where the HR expert or manager might have bias or error when identifying the appropriate candidate, since the functional requirements of the job nature is multi-dimensional and it is impossible for the HR expert or manager to distinguish all of them in an efficient amount of time. Human resource planning function is looked at as a standalone activity and it has to be integrated with the other dependent activities.

The HRDSS are needed for decisions like when, how, why and whom to select, train and reward. According to [13] HRIS is an organized way of acquiring, storing, analyzing, manipulating, and retrieving and disseminate information to the managers and stakeholders about the organizations Human Resources. Man power is important and a very valuable asset for an organization and has to be managed very efficiently by Human Resource professional. There is a need to store personal and skill information about every staff, information about all the involved tasks in the projects and project information.
There is a need for research into developing effective computer aided techniques for software projects planning which is a challenging for project managers. Unlike the other projects, the software project depends a lot upon the human resources. There is a need to properly allocate staff to a project which will add value to the organization and make the client happy. Task scheduling and resource allocation is not integrated, they are done separately.

Hence, a suitable model for planning software project has to deal with not only the problem of project task scheduling but also the problem of human resource allocation [15]. The success or failure of the projects depends upon the right kind of the people with the requisite skill sets and the most important thing is proper staffing. Software development is a people intensive activity. One of the most important decisions to be made by a software project manager is how to properly allocate human resources to the project. Therefore, improper planning will lead to a situation where the project manager might form a team that is not relevant for the project on hand [1].

The researchers approach takes into account the characteristics of the project activities, the available human resources, and constraints established by the software development organization.

Project managers face the problem of Software project scheduling. There is a lack of adequate models for human resource allocation and mid-size companies typically face a problem of identifying the appropriate human resources for projects. A hybrid approach that can handle combination of two different algorithms they are Event Based Scheduler (EBS) and Ant Colony Optimization (ACO). Which provide scheduling and also allocate the resources based on the project? The concept behind which an EBS is developed is to adjust the allocation of employees at events and keep the allocation unchanged when nothing is happening. ACO is used to assign the various activities in the project to suitable employees with required skills [4].

Data mining is an approach that is now receiving great attention and is being recognized as a newly emerging analysis tool. Data mining has gained a lot of importance in generating meaningful information to the society. This is due to the information explosion because of which people are not in a position to understand what is useful and what information can be preserved for the future. This is due to the wide accessibility of enormous amounts of data and the important need for turning such data into useful information and knowledge. Hybrid intelligent techniques are the best approach to support decision making especially in reasoning and learning. HR IDSS framework using hybrid techniques that include Knowledge-based system and machine learning approaches are best suited for the above conditions. Data Mining can be used for several tasks in HR activities such as selecting new employees, matching people to jobs, planning careers paths, planning training needs for employees, predicting employee performance.

Research aims to develop an academic talent model using data mining based on several related human resource systems. The researchers study shows how automated human talent data mart is developed to get the most important attributes of academic talent from 15 different sources like demographic data, published data, research, and others. It is difficult to evaluate and to prefer one person and not the other, even for an knowledgeable interviewer. Since each job also requires a different set of skills and competencies, selection is a matter of matching the right job with the right resource. This necessitates the need of a system that will aid in matching the right job with the right human resource [3]. In the era of Information explosion and information overload, it is necessary to first identify the right source of information and then go in depth to select the right talent based on skill sets, competencies
that are suitable to the organization. Data mining tools provide such detailed insights into the information we have on hand that help the decision makers to select the right people for the right job.

The following model developed by DeepikaKumariChak explains how a DSS can be integrated across various levels in the organization.

**Figure 1: Multi Level Perspective Model**


HRM systems should be designed, based on the need of integration of certain practices. Then, appropriate techniques to model the system should be used and finally it should provide the necessary tools to develop the system[5]. A multi-level framework of decision support system has been developed by the researcher which includes the functions like, Personnel selection, Employee Appraisal, Compensation and Human Resource Development and how these components are interrelated. The multi-layer perspective model developed by the researcher show decisions taken at various levels of the organization have a critical impact on the whole organization. There should be a identical thought process at every level in the organization which helps in proper integration of various functions at various levels in the organization. The researcher further states that the DSS must provide tools for this kind of analysis related to the HR practices.

HR IDSS is used for the specific functions in HRM domains and most of them use expert system or Knowledge-based system (KBS) techniques. The techniques that are used to verify and validate conventional systems are considered to be inadequate and KBS-specific methods are still in the early stages of development. Hence, majority of the new HR decision system researches use other intelligent approaches such as in man power selection, use Data Mining and Neural Network approaches. From the study, it was found that research is being done extensively in HR decision systems area. It was found that most of the human resource DSS applications use expert system methods. The use of Expert system in HRM activities has its limitations such as incorrect knowledge because of the difficulty in obtaining knowledge from the right experts, difficulty in representing that knowledge using computer model and not being able to handle complex tasks (inability of the system to learn) [12].

Having access to the right information is difficult. It is a known reality that Technology has an important role to play in the process. Once information is collected from
the right source then presenting it with the help of computer aided techniques involves lot of complexities where the system has to behave exactly as anticipated.

IDSS is used to support decision making and not intended to replace the decision maker’s task at any point of time. IDSS works under an assumption that the decision maker is familiar with the problem to be solved. IDSS gives full control to the user regarding getting the information, evaluating it and making the final decision. At present, there are quite a number of computer applications that apply intelligent techniques and use DSS concepts and modules. However, some researchers claim that it is an important part of DSS which uses the conventional name known as IDSS and others classify it as a supporter of intelligent system. The application’s name is given based on the intelligent techniques that they use, such as expert system which uses rule based system, knowledge based system, fuzzy sets, Neural Network for reasoning and learning capabilities. Most of the IDSS applications are specifically used for problem domain in that particular area. IDSS has consolidated the intelligent behaviors in its inference engine components which are used to support the decision making processes. In our study, we found that there are various types of intelligent techniques that are applied in IDSS applications such as knowledge base system data warehouse, fuzzy set theory, rough set classifier, multi agent. [9].

Researches and system development in this field increase year by year with new ideas and methodologies. In that case, some HR applications use hybrid intelligent techniques to advance the capabilities of the existing techniques. They integrate more than one intelligent technique in their application to be more effective in explaining, learning, reasoning and forecasting processes, which can produce quite similar decisions as decisions taken by human beings. Nowadays, researches have shown an increase interest in predicting human performance [9, 2]. Why the organizations use the different techniques mentioned above is to make sure that they have made the right choice. But at the same time, the decision will be a right one if the outcome is positive or as per the expectations of the manager. However, there has been little discussion about prediction employee’s performance which relates to human resource problem domains [10]. Predicting employee’s performance is an area of concern which needs to be addressed by practitioners and researchers. HR functions such as selection, job profiling, career careers planning, planning training needs for employees, predicting employee performance, predicting future employees all these need a lot of attention from both academicians and practitioners to explore and analyze the existing data and to discover useful knowledge.

III. CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

This paper has described the significance of study, literature review on HR applications; prediction and intelligent techniques used; related research in HRM known as HR application; intelligent techniques used in HR applications; the overview about KDD and potential intelligent techniques for prediction and the problems researchers have identified related to human resource allocation in projects.. From the literature study, most researchers have discussed HR applications from different categories. However, there should be more HR applications that use intelligent techniques applied to different problem domains in HRM field research, in order to broaden our horizon of academic and practice work on HR applications. The reason for this is that the workforce will be characterized by multicultural, multi-lingual, “virtual” talent pool. Deep expertise rather than location-based costing will be the differentiator and basis for pricing premiums. The current “offshore” mindset will be rendered obsolete and global delivery will become the norm [16]. The organizations are now
longer restricted to geographical locations. People have to work in different time zones, meet different people, work is different cultures and hence to cater to the needs of the diverse clients, the organizations need a varied talent pool.

Based on the problems identified in the literature review, we propose to design a IDSS model that will enable decision makers to make timely and accurate decisions regarding human resource allocation to software projects and continue to conduct empirical studies to relate IDSS with Human resource allocation practices followed by IT companies. This will help practitioners to concentrate on avoidable causes of project failure due to improper allocation of Human Resources. We also plan to conduct a study of using Intelligent Decision Support Systems which will help the Decision makers to overcome the challenges mentioned in the paper.

IV. REFERENCES