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Application of Operations Research in Human Resource Management

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Abstract:- In this research paper, we aimed at finding out the application of operational research in the field of human resource management. It has always been a known fact that humans are known to make mistakes if work is done without the help of any scientific tool. With detailed research in Human Resource management, it came to our knowledge that the training, selection, recruitment and other processes in various organizations are based on bias and partial views. Also, we realized that average capital that is being invested in the training and development programs is much higher than it should be.

This made us want to connect the concept of organizational research in human resource management i.e to maximize the satisfaction with minimum cost. With this motive, we aimed at reading the past articles where we gained information about how organizations are already using Operations Research techniques like Linear Programming and Assignment Problem, for the process of training.

Lastly, our research felt complete when we gave real life implications and it was proven to us that Operations Research techniques does help the organizations in making decisions about how they should go about with their HR policies effectively at minimum cost.

I. INTRODUCTION

"Facebook accused over of gender bias, allowing job ads that discriminate against women" (Press, 2018). Due to the growing exposure in the organisational culture and efficiency today, each person wants equal rights, be it a man or a woman. The focus is now on the knowledge and skills possessed rather than the gender, political reach etc. The entire process of HRM is now evolving into a fair and transparent one. At the same time, markets are turning more competitive and hence organisations need the best of the Talent Pool. They aim at finding the right person at the right price for the right job at the right time. As both the demand and supply side of the process of HRM are now focusing on the productivity, we felt the need to have a systematic mathematical model to measure and evaluate the process right from hiring to retention to compensation of the employees.

Just like any management decision, human resource management decisions involve using organizational resources in the hopes of affecting employee productivity. Just as we can analyse an investment in a new tool or plant in terms of the expenditures necessary and the expected change in productivity that results, so we can analyse investments in human resources in terms of the expenditures necessary to develop and implement programs, and the expected resulting effect on work force value. (Boudreau J. W., Cornell University, 1990).

Hence, we need to regularly monitor and evaluate if our HRM processes are profitable to our organisations or not. There are a lot of manual errors which could happen unintentionally/ intentionally which would hamper the growth of the organisation like –

- Gender Bias
- Ego Clashes
- Favouritism
- HALO effect
- First Impression Errors etc.

Operations research (OR) are an analytical method of problem-solving and decision-making that is useful in the management of organizations. In operations research, problems are broken down into basic components and then solved in defined steps by mathematical analysis. (Rouse, 2011).

Operations Research is the future of decision making. Operational research plays a vital role in this situation thereby increasing managerial productivity and making sure the scare resources are managed more effectively. The current state of the art as practiced I india is examined vis-à-vis the potential in the context of the economic incentives and disincentives; social, culture and political factors; computer availability and usage; availability of OR personnel and current management styles.

II. INDUSTRY OVERVIEW

Listen randomly to 10 interviews of Global Fortune 500 CEOs and you will hear them say, "it is all about the people" when accounting for the success of their respective companies (Abhijit Bhaduri). As of today, 2018, names like MERCER, Kelly Industries and AON have created their importance in the Indian sustainable ecosystem. Had this same statement been made any time before 2008, it would have sounded too crazy for huge industries like these to sustain here. There wasn't even much of any statistical evidence, but yet the Indian market evolved an industry, today known as 'The People's Industry'

It was earlier seen as a slow bureaucratic personnel department but is now seen as "human resources" that acknowledges the value of employees as an organizational resource. This change has pushed HRs to become a strategic

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partner to business leaders, contributing to significant business decisions, advising on critical transitions, developing the value of the employees, creating an organizational culture - in short, they now have a seat at the table.

HR personnel today also handle the heavy burden of recruitment, payroll, training and development, retention, performance management and ensure a safe and healthy workplace environment to work in.

If you ask why the industry has grown then these are the following reasons why:

- Increasing globalization
- Rapid technological change
- Tougher competition
- New structures and hierarchies
- New organizational alliances
- New ways of assigning work
- Changes in employees' priorities, capabilities and demographic characteristics (India Today, 2016).

Within these and many such pressures, there is a need for, or we can say, there is an opportunity for the human resource function to play a critical role in helping organizations sail through these transitions.

With these needs comes great responsibilities like:

- Hiring and retaining talent,
- Lowering labor costs
- Winning the war for talent
- Aligning technology
- Adapting, engaging and retaining the rapidly changing worker profile
- Understanding the intricacies of workers' qualifications
- Understanding skill gaps and developing employees to match the requirement
- Dealing with the risks of a global operation (India Today, 2016)

Now how much is Operations Research growing in India? Operations Research connects engineering with management. The industry is an infant in India with potentials much more than expected. This market is so niche and untapped that it's hard to get a job in this sector but if you do then the remuneration is much more than the average. India as a country is huge with an enormous market and customers hence OR does make life easier in the marketing sector but when it comes to the Human Resources sector then questions are still asked whether OR is still needed in HRM or not. Companies in India which recruit OR analysts are usually manufacturing or services-based industries solely for the purpose of logistics.

While some corporations are pretty good for their people practices like PepsiCo and General Electronics, most companies still go about the business of talent acquisition, retention and development the same way they did in the past. While there has been intent to change, in the absence of the appropriate tools, HR and business leaders have found it challenging to deliver on the HR mandates. Predictive analytics and related technologies have the ability to transform HR as we know it.

III. RECRUITMENT

A Harvard Business Review study showed that two out of five new CEOs fail during their first 18 months (Charan, 2005). The essence of successful hiring at any level is to find someone who is willing, able and qualified for the vacancy. Traditionally, when HR comes across an interested candidate, it collects the pertinent data and makes the best possible judgment call. In today's dynamic business climate, companies can't rely only on past performance and limited interactions during the interviews to predict future performance of a candidate.

Suppose we have to choose one from a pool of 10 similar candidates. Which one has the greatest likelihood to succeed in the role? Once hired, how long will it take this person to succeed, assuming the success metrics for the role are clearly defined, and how successful would she be? If HR acquires the ability to predict – to identify, quantify and rank – the future performance of a candidate before making a hiring decision, it would be a great value addition to the business. Enter predictive analytics. By considering datasets that are intuitively obvious – resumes, job descriptions, references and interviews – and some that may not be so obvious, mathematical algorithms can be used to answer questions about the future.

IV. ATTRITION AND LOYALTY

Gone are the days when employees worked for decades for the same corporation. Today's businesses have learned to live with employee churn, while evolving to minimize the impact of attrition on the overall health of the business (Abhijit Bhaduri). While some businesses, such as insurance sales and business process outsourcing, are known for their high attrition, many other businesses also suffer regularly from attrition, especially in key leadership roles.

HR needs predictions, as well as decisions to take advantage of the questions pertaining to employee behavior. Once the appropriate datasets, business rules, etc. are gathered, predictive analytics can answer the what, when and why questions, and operations research can answer the how and what-if questions for HR. Loyalty is the flip side of this coin. Similar methodologies can enable forward-looking decisions with respect to which incentives – and it doesn't always have to be money – will generate loyalty from which employee and for how long.

V. LEARNING AND DEVELOPMENT

This learning and development part of the organization kicks in to bridge the capability gaps that the recruiting team is not able to close. People develop their skills from a variety of experiences, interactions and relationships. Formal development plans try to shorten the time needed for developing these competencies.

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Predictive decisions would help customize this methodology per employee per competency gap (Abhijit Bhaduri). So, the individual development plan for Employee A would not only state that the development gap for Employee A is "decision-making," it will also suggest having Employee X mentor A because that is the most effective mentor-mentee relationship for this particular skill. The plan may go on to say that Employee A should, however, learn about building "financial acumen" by watching a video tutorial.

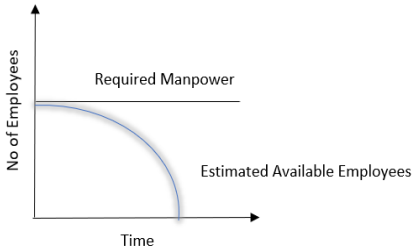
VI. TALENT MANAGEMENT

Many organizations that have a formal approach toward talent identification use a performance vs. potential matrix by classifying their employees into high-medium-low performers and with high-medium-low potential (Abhijit Bhaduri). The assumption is that past performance is an accurate predictor of success in future roles. To assist in potential identification, the companies use assessment centers to simulate scenarios that determine success in the next role. In a world that is rapidly changing, the assumptions about future roles that do not keep pace with the external shifts are not going to predict which employee to bet on.

Most succession planning processes today assume that a trend of strong performance is the best predictor of success in a future role, no matter how different the past roles are from the future role. Adaptive algorithms that produce updated predictions, and associated decisions, as more (and better) data becomes available can help.

VII. LITERATURE REVIEW

In the field of Human Resource Management, there are chances of many challenges that will soon enough force the field to take up more of quantitative techniques than qualitative for the various processes like Recruitment, Selection and Training. The HR Department of any organization is usually seen as the department of 'soft discipline' and thus the total human capital invested in the same is not calculated properly. Operational Research will help the Human Resource Department to construct systematic models and measures that will help that keep a track of the actual human capital invested in the dame. One of the challenges that has been identified in the previous studies is Aging. This means that the organization will have to face consequences of the fall in population growth. The impact of this will be that the gap between the available and required workforce will increase because of the above stated issue. This will lead to an increase in the rate of employees being recruited yearly. Any operational research problem starts by analyzing the current situation and the current impact of aging. It is believed that OR can help HR managers to forecast what kind of population growth and aging problems they might face in the future. Previous studies show that using the Markov Theory, techniques for better workforce planning and development can be modelled. These models are based on the probabilities where either the employees are pulled towards the development of their career or they are pushed towards the promotion. These probabilities are estimated from the past performance. The combination of these Push and Pull strategies will help the HR to formulate and evaluate the standards and quality better, respectively. It has been noted, in the past, that this technique is already being used in military training and airlines. (Poppelaars, 2008)



There are various techniques in Operational Research which will help the HR departments in effective and efficient workforce planning. Based on the studies made in past, there are 4 major theories that aim at different dimensions of Human Resource Planning i.e. Markov Chain, Computer Simulation, System Dynamics, Optimization. The first three models of the above stated focus on predicting the future result in the case where the already existing policies are being followed and the latter one focuses on developing new policies for already existing goals. All four models come in with their set of limitations, but System Dynamics is the best suitable as it is affected by the feedback and nonlinearity. (Wang, 2005)

In the paper studied, the various challenges faced by an HR Team in an organisation were workforce diversity, globalization, political and legal changes, IT advancement etc. They felt that training of employees should increase to add to the productivity. They also realised the need of appropriate non-financial techniques to attract and retain the right employees along with a proper performance management and evaluation system. The importance of adaptability and flexibility of HR strategies has been expressed as Information Technology and Organisational Culture keeps changing. HRIS (Human Resource Information System) is a necessity in today's time where all the data is stored real time. In future, with the help of this data, real time calculations and models can be structured for better efficiency. Emphasis on proper performance evaluation system and proper career development plans should form a part of HR to motivate the employees to continue long-term with the organisation so that the cost of hiring is low and the organisation can reap the benefits of employee loyalty. (Mrs. Ekta Srivastava, 2006)

The research paper comes with a network model for HRM to substitute the traditional unstructured interview-based knowledge-based method to match the applications to the posts. It eliminates the manual errors of the traditional method. The system is concluded to make timely and effective decisions and provides a string base to deal with employment planning, recruitment and salaries. They have used the benefits of the computer like accuracy, speed, reliability, cost and security, mass processing etc as against

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the human errors and designed a network. They have designed a model where they use human based web network to match similar jobs with similar employees. They chose network model as decision making is a classification problem and the utilised model solves it in a systematic and easier way. Their relational database includes applicant personal data, applicant academic qualification, applicant job history, organisation, job requirement, job vacancy, performance, (Akinyede, NNWBHRSM)

The research paper studies the costs of hiring, developing and retaining the employees as an investment to the firm and state that there should be enough benefit generated out of them which justifies why we shifted the firm's resources (monetary) to the HRM instead of business operations or investments. The research paper gives a new direction to viewing HRM as an investment and how mathematical models and formulae will help in easy, quick and effective communication. The research paper's aim is to identify the positive or negative outcomes of decision options to improve decision quality, efficiency and communicability. (Boudreau J. W., 1990)

In the process of decision making, the most important part is choosing the alternative that not only is the most successful option but also the most efficient one in terms of time and cost. This option should be the most suitable to the organizational and individual goals. To make the decision process easier and more accurate for individual and organization at large, tools from Organization Research can be used. Based on previous studies, tools like Linear programming help the organization in the above stated. OR involves the construction of a mathematical model which represents the entire situation that requires decision making. This formulation of model involves converting the verbal description and numerical data into mathematical expressions. The basic motive of this model is to represent the relationship between different decision variables in any problem. This relationship helps them understand and find alternatives better. "Linear programming is a mathematical modelling technique useful for allocation of limited resources, such as labour, materials, machine, time, warehouse space, capital, energy, etc to several competing activities, such as products, services, job new equipment, projects etc, on a basis of given optimality". Seeing the history of Linear Programming, researchers view LP as a "revolutionary development" as it has given everyone a platform to state the goals and figure out a systematic way to choose the best alternative. Linear Programming was introduced in 1949. Due to the contributions made int the field of LP, it has made it easier to use this tool in our day-to-day life. In the process of training, Linear Programming can help the organization by formulating models that aim the reaching the optimum effectiveness of the employees with the least cost. These models will help the companies know that exactly how many employees should be sent for training programmes and from which department. This will eventually lead to less capital being invested in the Training programs and increasing productivity. Linear Programming is a tool that helps in achieving the best possible solution keeping in mind all the constraints present in the situation. In the study, this model has been used to minimize the cost of training the teaching and the non-teaching staff of Vadodara Institute of Engineering, using Linear Programming. There were various results that were expected by the Institute while there were some that weren't. This study made them realise that the cost that was being invested in the Training program was a lot more than what was required and also number of people that are being sent for the same from each department can be reduced. It is recommended that whenever there is a compulsory training program for the teaching and non-teaching staff, the Institute should use this result as it would optimise the results of training and simultaneously minimize the added costs. (Gupta, 2014)

It is known that operations research came into being during World War II when it was realised that resources are scarce in nature and there was an emerging need to solve this issue. A model is known to come into existence as early as in World War 1 where Thomas Edison was working on minimising losses in shipping caused by enemy ships and AK Earlang was studying the fluctuating demand for telephone facilities. Such experiments were used as a base for the waiting-line theory. The term "Operation Research" was a term which was given was during the research on military activities during World War II. The war includes many tactical problems which required strategizing since they are extremely complicated and appropriate solutions were to be obtained from specialists and experts in statistics, mathematics, engineering, probability theory, behavioural and physical formed differentiated units to deal with the complex problems of various military activities. Such differentiated groups of people were initially formed by British Air Force and later, similar groups came into being by the American armed forces. One of the groups in British were Blackett's Circus. The leader of this group was Professor Blackett. He was a part of the Reader Operational Research unit. Problem of analysing the coordination of radar equipment at gun sites was assigned to hm. The initiative of similar groups, especially on the area of radar detection are considered extremely important in winning the air battle by the British. The success of the group with such a different approach was taken up by the ailed nations. Beyond the end of the world war II, the scientist who was actively participating in military OR groups made conscious efforts in applying the approach of operation research to civilian issues related to various sectors like business, research, industry, development etc. There are three significant factors behind the fast growth in the application of operation research approach:

• The economic and industrial pump up beyond the World War II gave the continuous use of machinery which resulted in, automation, decentralization of operations and division of management functions. The industrialization also led to solving of complex managerial problems and therefore application of operation research to managerial decision making became popular.
• Operations researchers after the world war continued with their research and innovation. Some important technological advancement was made. One of the important people after the world war in the development of OR was George B. Dantzig. He introduced the concept of linear programming

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and its solution by a method known as simplex method in 1947.numerous other techniques were also developed - statistical quality control, dynamic programming, queue theory and inventory theory were well developed before the end of the 1950.
• High-speed computers made available the use of analytical power. it was possible to use various OR techniques for practical decision analysis with the help of used computers.

The study aimed on the application of linear programming techniques in the efficient use of resources for training of staff in Federal Polytechnic, from the non-academic as well as academic units of the organisation. The study uses the superior and subordinate staff from the units as the deciding variables. The problem was formulated using the secondary data of numerous staff members under different departments. Mathematica 6 (Wolfram) was used for doing the analysis. There were in total two solutions

- Optimum solution
- Integer solution

Not all the solutions that were determined had an optimal solution from the data collected. The model was tweaked to give an optimum solution to fulfil the desired goal. The results show that the senior and subordinate employees from each unit that should be sent for training purpose can be reduced compared to the number in the past for effective and efficient utilisation of resources. (Fagoyinbo, 2010)

VIII. SIGNIFICANCE

There are various business decisions to be made involving certain factors by every businessman. It is often noticed that these factors are somewhat unknown to the decision makers and decisions hence taken are based on intuition and experience which may or may not turn out to be right. Operations Research is a tool that helps business owners run their companies better by considering the various facts and figures which help in achieving optimal decisions.

When we talk about human resource management, there are many integral functions performed by this department like staffing, recruitment, training etc. There are various techniques used to perform these functions but since it involves management of people bias cannot be ignored.

Despite high level of intelligence and sophistication, decisions are made out of various bias. After all we are only human. Many glitches in our thinking like Anchoring bias, bandwagon effect, confirmation bias, clustering illusion lead us to make questionable decisions and hinder our rational decision making.

This makes us realise a need for a systematic technique to solve the above problem. This need is satisfied with the use of Operations research. It is an analytical method in which problems will be broken down in small components and then will be solved using defined steps.

There are various techniques like Assignment problem, linear programming problem which can be used. Markov Chain is another technique which will help sine it considers probabilities.

All these techniques provide a one stop solution to the various problems that might occur for management of people on a day to day basis. Thus, we can say that operation research is highly useful and significant in human resource management.

IX. METHODOLOGY

While studying the subject Human Resource Management, we came to know how there are times when there are a lot of biases during the process of Training, selection etc. with a lot of added cost. Fields like Human Resources Management and Marketing, where major job is done by the individuals, have a major scope for error. Thus, there needs to be an element of science as well to increase the efficiency. We wanted to look for ways to make it fairer and more systematic. This made us think of studying the application of Operational Research in Human Resource Management as OR aims at optimizing the solution while minimizing the cost and also, it is one of the most reliable mathematical tools available to mankind in the present day.

The data will be collected through secondary research as the nature of the research does not lend itself to primary sources. Through secondary research we will identify the application of Operations Research in Human Resource Management and its impact.

X. SECONDARY RESEARCH

➢ *Sources:*

- Previously published Research Papers
- Articles
- Blogs

XI. ANALYSIS

Majority of the organisations have realised that Employees are an asset to the organisation and we must look at them as an Investment but very little realisation has come in terms of adding numbers to it i.e. quantifying their costs, assigning them work based on pre-determined criteria rather than trial and error method etc. We will choose few techniques of Operations Research here and apply them in the field of Human Resource Management to give the firms worldwide, a new direction to look at the employees.

A. Linear Programming Problem

A linear programming problem may be defined as the problem of maximizing or minimizing a linear function subject to linear constraints. The constraints may be equalities or inequalities. (Ferguson, 2000). We have a Minimization/ Maximization Function known as the Objective Function along with a few constraints and we then plot them on a graph to find out the best possible combination to satisfy the Objective Function.

For example, let's take a company ABC Ltd. The Objective function could be to minimise the cost or the labour hours of x departments wrt constraints relating to

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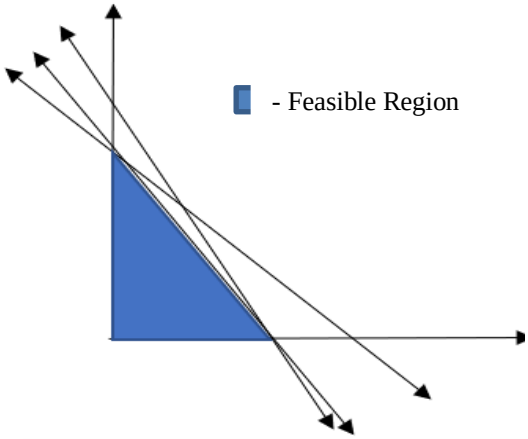
different labour categories, work timings etc. They can then plot these numbers on the graph as in how many employees should each department have in order to minimise the cost or maximise the productivity. The sample LPP problem model looks like-

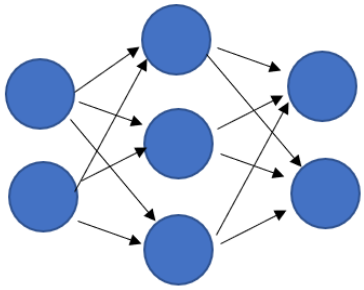


Min Z = 5x1 + 10x2
Subject to constraints-
4x1 – 7x2 < 30
5x1 + 19x2 < 678
x1, x2 > 0

B. Network Optimization-

Representing a problem as a graph can provide a different point of view and could make it easier to solve and Network Theory provides a set of techniques for analysing these graphs. (Cl Cam, 2000)

For example- ABC Ltd is a company which serves as an online portal for job search. It has to take various requirements from the companies (demand centres) and provide them with the right employees after selecting them from the online portal (demand centre). It could be shown by a basic network model as-



Here, the Input can be the various resumes submitted by the applicants, hidden could be the company's operations and the output can be the selection suggestions given to different companies.

C. Simulation

Systems simulation is a set of techniques that use computers to imitate the operations of various real-world tasks or processes through **simulation**. (Wikipedia, 2018)Simulation in HRM could be done in the following ways-

- Simulation Training can be undertaken for risky jobs where on the job training can prove to be dangerous. It can also be used in the fields where live training is costlier than simulation training. It gives a real life like experience.
- It is possible to simulate the organizational performance under various hypothetical situations like recession, strikes etc.

Few companies who follow simulation training are AIIMS, Train4Trade Skills, Lloyds, Banking Group etc.

D. Assignment Problems-

The assignment method is used to determine what resources are assigned to which department, machine, or centre of operation in the production process. The resource would be monetary, personnel, technological or another type of resource. (Investopedia, Investopedia, 2018)

For example- ABC Ltd has different jobs for different employees with a time constraints or has different promotion packages for different employees, assignment model can solve it by converting the issue into a mathematical problem. Steps to do so-

Step 1 - Balance the AP by adding dummy rows/columns.
Step 2- Row minima
Step 3- Column Minima
Step 4-Alloting to the 0s
Step 5- Final Assignment
An assignment model looks like this-

	A	B	C	D
W	3	2	4	8
X	5	8	1	4
Y	7	4	3	2
Z	4	6	9	1

E. Queueing Theory

Queuing theory is the mathematical study of the congestion and delays of waiting in line. Queuing theory (or "queueing theory") examines every component of waiting in line to be served, including the arrival process, service process, number of servers, number of system places and the number of "customers" (which might be people, data packets, cars, etc.) (Investopedia, investopedia, 2018)

For example- ABC Ltd is a call centre. In a call centre about 70% expenses are that of HR and the major issue is delays in telecommunications line and growing customer waiting. In such cases, firms can use queueing theory to find the right number of servers (employees) and the number of customers per server.

XII. CONCLUSION

As has been established previously, Operations Management (OM) and Human Resource Management (HRM) have since time immemorial been very distinct fields running parallel to each other but seldom intersecting.

In practice, the aforementioned fields interact on occasions of administrative issues revolving around payroll systems and other such similar issues. Whereas in theory, the two subjects are undertaken by disjoint groups of scholars, who specialize in completely separate disciplines. As times have progressed, the fine line of distinction between the academia and practice of HRM & OM have constantly been ebbing away. This blurring out of the talked about distinction can primarily be attributed to Globalization, Workforce Diversity, Dynamism in the Political, Economic and Legal Environment and most importantly the revolutions in technology.

Of considerable importance is the Cost Benefit Analysis' usage in HM. This approach is a very holistic approach that not only considers costs and benefits associated to a monetary value, but also accounts for non-monetary factors such as efficiency, wastage of time, employee satisfaction, job security etc. This enables the management to consider all the factors (monetary and non-monetary) while arriving at a decision, thus ensuring the most optimal use of resources. Given how limited our resources are, and in lieu of rising global inflation, it becomes imperative for organizations to use resources deftly in order to maximize their gains and minimize their losses.

Another important aspect is the recruitment, selection training of a company's workforce – which is aided by the quantitative models of OM. It helps in identifying and improving on particular skillsets of employees and other personnel that ought to be equipped with certain skills and qualities.

It is often said that the success of an organization or any working body is primarily determined by the abilities of those who are a part of its day to day work cycle. And since employees are all of the above and are considered to be an organization's biggest asset, this OM Process forms an integral and indispensable part of the sustainability of an organization's growth and future prospects.

Even though Operations Research has exposed the entire corporate world to the wonders of scientific management and extreme reliance on objective models for decision making, one must never forget that these models and simulations can never account for the human factor. Hence an extreme and unrelenting reliance on these methodologies with no consideration whatsoever for the human factor can prove to be harmful in the long term and can result in mistakes being rendered by companies and other organizations.

Mistakes in people decisions can be costly for the business. Being successful in HR is about making correct decisions about critical people matters. Any foresight before making a people decision – be it in recruitment, retention, development or succession planning – is a powerful weapon in HR's arsenal. Do predictive decisions guarantee success for HR? No. However, studies show that most people can't intelligently process more than eight variables at a time. Predictors that humans come up with inherently embed some kind of a cause-and-effect relationship – our brains are just not equipped to identify and quantify predictors that may not have cause-and-effect synergy. On the other hand, advancements in mathematical sciences and computer science have enabled algorithms to consider thousands of related and unrelated data points (numerical, text, audio, video, etc.) and business rules, process them computationally and come up with far better future decisions than human judgment and traditional methods can.

XIII. LIMITATIONS

1. Lack of primary data. Primary data gives the contemporary news and personal opinion. But due to the lack of awareness about OR and its importance in the general public, we had to rely on Secondary data.
2. As we have relied majorly on the findings of past research papers, there could be biases and exaggeration in a few findings. Also, the authenticity of the Internet is questionable.
3. Due to lack of depth in the subject, we have researched on the overview of the entire topic. We have given the scope of HRM in OR using different techniques but couldn't present a proper mathematical model.
4. Hence, this research paper has a limited depth but high scope.

XIV. FUTURE RESEARCH

1. The scope of OR in HRM could be studied in depth using a technique with detailed model and calculations.
2. Checking the feasibility of each technique for different HRM practices.
3. The ideal way of integrating the traditional HRM with the upcoming OR models.
4. New techniques in OR which could simplify the process of HRM to make it more employee friendly and sustainable.
5. A different model to identify only the soft components (human component) of the efficiency and working of the employer-employee relationship.

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