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HR Metrics & Analytics
MSB21T2001

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Index- Session 34

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Session 34 - Objectives

- Application of predictive analytics is talent retention
- Strategic HR Metrics for talent retention
- HR data required for HR analytics and predictive modelling
- Understanding Predictive Models
- Major contributors in the field of HR analytics
- Software Solutions

Recap

- HR Analytics and Predictive Modelling
- Different phases of HR analytics from an organization's perspective
- HR managers require strong statistical and data analysis skills.
- Examples of Predictive Analytics
- Period-wise Attrition Rate
- Correlation of Attrition
- Correlation of Voluntary and Involuntary Attrition in Different Time Frames

HR Analytics and Predictive Modelling- talent retention

- One of the most important areas of application of predictive analytics is talent retention.
- Common metrics like employee turnover, both voluntary and involuntary, can help us in understanding the trend.
- But when comparison of such a trend over a time period across all divisions, all functions and hierarchical levels is necessary, we have to go beyond metrics and make use of predictive analytics.
- Similarly, with standalone metrics like pay for performance, we can understand the pay differential of high performers compared to other employees of the organization; but how pay contributes to the business value of the organization can be understood through analytics.
- Further, how change in pay will alter future business value can be understood by using predictive analytics. Predictive analytics bring change in HR reporting going beyond transactional details and, thus, can add value to human resources.

Strategic HR Metrics

- Despite our discussions emphasizing analytics and predictive analytics, we cannot undermine HR metrics as HR metrics form the basis of our further analysis with analytics and predictive modelling.
- Some strategically important HR metrics which can help in adding value to HR reports through analytics and predictive modelling are presented.

- **Employee Turnover Rate.** This can be calculated for different time periods by using the following formula: $(\text{Number of separations during a time period} / \text{Average number of employees during the time period}) \times 100$.
- **Revenue per Employee.** This can help in assessing the cost of employee turnover and can be calculated by using the following formula: $\text{Total revenue} / \text{Total number of employees}$.
- **Yield Ratio.** This can help in understanding the importance of various recruitment sources and can be calculated based on the percentage of applicants for different recruitment sources.
- **Human Capital Cost.** This can tell us the investments made in employees in terms of compensation and benefits, and can be measured with the following formula: $\text{Total compensation and benefits cost} / \text{Number of full-time employees}$.

Strategic HR Metrics

- The aforementioned list is only indicative.
- Depending on the organizational need, couple of other strategic HR metrics, such as human resources to staff ratio, ROI, promotion rate, female employees' representation at the management level, rate of employees' absenteeism, average age group of employees and so on, can also be considered.
- Strategic HR metrics: Assess the strategic knowledge and skill sets, competencies, quality of cross-functional teams, ratio of pay at risk and so on.
- The success of HR analytics and predictive modelling of HR decisions largely depends on the use of statistical tools combining human resources and business data.
- Relating human resources with business data can churn out information on customer satisfaction, market share trend and nature of products sold, e.g., premium products, mass products and so on.
- Some of the universal lessons for HR managers to make HR analytics and predictive modelling successful are combining intuition with analytics, making analytics more business centric, identifying skills that are required to use HR analytics, developing predictive models, ensuring involvement of subject-matter experts in analytics projects, trying to be realistic, taking decisions that are actionable and so on.

Understanding Predictive Models

- We use predictive models to guide different decisions through a series of predictions.
- Therefore, with predictive models, we cease to focus on the data, but rather focus on the underlying theory of reality. Hence, predictive models need to be accurate, reliable and credible.
- The assessment of the quality of a predictive model is done by simulating the future eventuality.
- To illustrate which incentive schemes will have more motivational effect on workers, the workers can be assessed comparing our predictions with the outcome that had actually occurred.
- In fact, we have built our predictive models based on the data sets of past occurrences.
- Any predictive models in human resources make use of cross-sectional data.
- For measuring reliability and validity, we make use of two random partitions: training or learning data set and testing or validation data set.
- The underlying thought processes for such data division are data sets, based on which we develop predictive models, represent real-life situation, and the real-life situation or processes are stable over a time frame; say previous quarter data may reasonably be stable during the following quarter.

Understanding Predictive Models

- Data division between training and testing is done through simple random assignment.
- Training data sets are larger than the testing data sets.
- Predictive models developed based on training data sets are tested against testing data sets to assess the performance, and this also helps in model validation.
- However, we also see a trend in dividing data into a third data set, i.e., validation data sets.
- In such cases, we use test data to refine our model and validation data to check the accuracy of our predictive models.
- In some cases, the cross-validation of predictive models may be required.
- In such cases, we divide the data into multiple sets and run our model against each data set to check the accuracy.

Understanding Predictive Models

- For checking and re-checking the accuracy of the models, we require double-checking our work, developing new algorithms when the one available does not yield results, selecting different variables, discussing with business domain experts for clarity on data sets and variables and so on.
- Descriptive HR reports with HR data sets, though traditional, benefit HR managers and organizations to monitor HR functions, helping managers understand whatever is going on.
- However, with descriptive HR reports, HR functions today cannot sustain.
- HR functions today being more strategic and business aligned, HR reports need to be more predictive.
- Bersin (2012) highlighted the importance of predictive analytics, as it can help us in interpreting HR data more meaningfully with due identification of trends and patterns, and causal factors including recommended action plans to avoid the recurrence of problem of HR issues.
- Huselid (2014) also endorsed the importance of HR analytics and predictive analytics as it facilitates strategic decision-making.

Contributors - HR analytics

Some of the known contributions made in the literature of HR analytics are the works of

- K. Edwards and M. Edwards (2016),
- Fitz-enz and Mattox (2014),
- Sesil (2013) and
- Smith (2013).

All these contributors acknowledged the importance of HR analytics, including predictive HR analytics in making HR decisions more strategic and business aligned.

When HR analytics are predictive in nature, they make use of predictive modelling based on inferential statistics for assessing the causal factors and deriving a solution visualizing the future.

This obviously requires HR managers to acquire statistical knowledge to infer and understand the meaning of the results.

In true sense, in the corporate world, we still find the use of HR metrics and partly HR analytics to process HR data sets and generate HR reports.

Predictive analysis of these data sets with statistical techniques is found to be less.

However, the new generation of HR managers is expected to meet this gap.

HR data required for Predictive

- Some of the important HR data that are commonly required for HR analytics and predictive modelling of HR decisions are as follows:
 - Demographic data of employees
 - Data on knowledge, skill and competencies
 - Training-related data
 - Data on employee engagement
 - Performance-related data
 - Compensation- and benefits-related data
 - Data on customer satisfaction
 - Data on employee attrition or turnover.

HR data –Predictive Modelling - Decisions

We run our predictive models making use of such data sets to arrive at decisions that are likely to be less flawed and risky.

Along with the concepts of predictive HR analytics that help us in predicting the future and taking our decisions more strategic and business aligned, we need to have clarity on other related terms that often interfere with the operational meaning, e.g., the term prediction which denotes the identification of predictors or potential causal factors for measuring a variation like predictors of employees' attrition.

Predictors, thus, drive an outcome; also, these can be potential causes of variation of any HR issue that we are envisaging to predict. Predictive HR analytics denotes predictive modelling which helps in the identification of a series of factors for variations, e.g., in employees' performance level, and then use the model to predict the future outcome, i.e., the employees' performance level, when we take some actions, such as raising of incentives, increase in employee engagement, creating career development opportunities and so on.

Also, predictive models are capable of predicting the future employees' performance level and suggest possible remedial actions to make future employees' performance level more satisfactory.

DATA AND INFORMATION FOR HR PREDICTIVE ANALYSIS

- We have already said data availability largely depends on the nature of an organization.
- Many organizations do not recognize the strategic and business roles of human resources.
- For them, HR functions are managed in silos.
- This is most common; hence, for illustrating cases of HR predictive analysis, we will restrict our focus only on HR data.
- By linking data sources and thinking broadly across the whole organization, we are able to model organizational patterns of behaviour and link human resources and people-management practices directly with revenue and efficiency.
- In order to link and analyse the information available with ease, we need to use a statistical analysis package, of which there are many available on the market.

Possible Sources of Information/Data for Use by Human Resources

Information/Data Source	Description	Example
HR database. Commonly used HR databases are SAP or Oracle.	Information on all HR activities, and also personal details about the employees.	All demographic data, performance ratings, job role, compensation and benefits, attendance, leave information, health status, training and so on.
Employee survey data. Organizations conduct surveys from time to time to measure employees' attitude, motivation level, satisfaction level, response to change and so on.	All information based on survey responses received from employees on various issues. Common employees' survey can be attitude survey, employee engagement survey and others alike.	All survey data or information on employees' attitude, engagement level, motivation and job satisfaction level, employees' perceptions on workplace equity and so on.
Customer survey data.	All information on customers' preferences in alignment with the employees' profile, operation, service delivery, sensitivity to customers' needs and so on. These data and information can benefit organizations in bringing change in customer services and processes, employees' behaviour and skills and so on.	All customer ratings data pertaining to customer services, data on customer satisfaction, customer preferences and so on.

SOFTWARE SOLUTIONS

- Once data and information are available from multiple sources, as explained, we perform predictive HR analysis by using various software solutions. Some known software solutions available on the market are as follows:

• SPSS	Minitab	Stata
• SAS	R	JASP
- Almost all software solutions have common features and are capable of performing HR analytics jobs along with predictive decision modelling.
- In next session, will be shown the process of doing HR analytics and so also predictive decision modelling by using IBM SPSS predictive analytics software.
- Hence, our discussion will centre on its process of use. However, similar analysis and predictive decision modelling can also be done with other software solutions, the processes used there are different.
- IBM SPSS predictive analytics software can perform statistical analysis and reporting, predictive modelling and data mining, decision management and deployment, and big-data analytics.
- It can enhance the decision-making process related to business through various analyses, hypothesis testing and predictive analytics, establishing causal relationships among large amounts of time series data.
- At the end of this module we have developed predictive decision models for futuristic HR decision-making, based on real-life HR data, making use of IBM SPSS predictive analytics as a tool.

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In case, you find any difficulty in understanding the concepts of lecture, please feel free to contact.

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Thanks